Compendium of Research Undertaken in Nunavut 2005

Nunavut Research Institute

Foreword

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, which 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, which 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:

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Table of Contents

Social Science Research

Table of Contents

Traditional Knowledge Research

Medical and Health Related Research

Table of Contents

Physical and Natural Science Research

Table of Contents

Physical and Natural Science Research (continued)

Table of Contents

Physical and Natural Science Research (continued)

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Project Title: **School based Service Model**

Summary:

For school counselling, a new model in which the teachers were involved with the counselor and me in the component of planning for classroom interventions was begun last year. I, in conjunction with the Qikiqtani School Operations, would like to do some more formalized research to determine if this model is, in fact, an effective way to provide service in the communities. Children will be assessed by the classroom teachers using a pre- and post-questionairre to identify problem behaviors and treatment outcomes. Treatment will consist of school counselor interventions and classroom strategies implemented by the teachers. The effectiveness will be measured at the end of the school year.

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Location/Region: North and South Baffin
Project Title: **Inuit Family Kinship and Well-being**

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 families from different generations of Inuit, to find out what family life was like for the elders when they were young compared to what family life has been like for the current generation of young people. We will ask Inuit of all ages what family life is like today, how family is important, and in general what the key issues are regarding family life.

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Project Title: **The role of school within a remote Nunavut community: the relationship of community and Inuit Qaujumajatuqangit in Education of Youth**

Summary:

One of the most important sites of education in any community is the local school. In remote communities, further away from more urbanized areas of Nunavut, schools become even more significant to the local community. The communities of Resolute Bay and Sanikiluaq are both remote communities of Nunavut, yet are unique. Resolute Bay is the second most northern community in Canada, while Sanikiluaq is the southern most community in Nunavut. This project intends to study the educational, social and cultural relationships between these communities and schools that serve them. This study is not a comparison, but a study of two schools in two different communities. The study will give particular focus to the role of traditional knowledge, Inuit Qaujimajatuqangit (IQ), within this remote school and how it helps to establish beneficial linkages to the larger community. Research into the ties between community and schools in remote areas of Nunavut can help to highlight the importance of schools to the communities they serve, and identify the best practices for meaningful education of Nunavut youth in the 21st Century. Research methods for this study will include observation of teachers within classroom settings in order to understand how IQ is integrated into instruction and other projects, programs and activities. Interviews, with permission, will also be sought with teachers and other members of the community about community linkages within the school, and the role of IQ in education. The results of the thesis (M.Ed) research will be shared with the communities through Qarmartalik School, Nuiyak School and the Nunavut Department of Education, as well as the Hamlet Councils of Resolute Bay and Sanikiluaq. It is our hope that the results of this study will contribute useful knowledge to the ongoing endeavours to improve education for the youth of Sanikiluaq, Resolute Bay, and all of the other remote communities of Nunavut.

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Project Title: **Young Canadians in a Wired World**

Summary:

In this study, MNet would approach school districts/councils to request permission to approach individual schools for their permission to conduct a brief paper-based survey. Nunavut's Department of Education has licensed Mnet's professional development workshops for teachers, such as the Web Awareness Workshop Series, for the past two years. In addition, this year the Department of Education licensed Mnet's new in-class resource, "Reality Check! Evaluating Online Information."

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Location/Region: Nunavut wide
Project Title: **Canadian Multiculturalism: Day School Contest and Perceptions of Children and Youth**

Summary:

This research will investigate youth perceptions of multiculturalism in Canada by surveying students in grades 6-7 and grades 10-11, as well as the educators of those students. The research will concentrate on an in-depth analysis of multicultural experiences and awareness, levels of intercultural development, the impact of multicultural issues on daily life, and exposure to multicultural images and experiences through the media and school environments. Participating schools will distribute the Perspectives Survey and consent forms in individual envelopes to students either in grades 6-7 or grades 10-11. The students take the surveys home to be reviewed with their parent(s) / guardian. The surveys are returned within one week in the sealed envelope. Teachers in participating classrooms are also asked to complete a survey. This research is being conducted in conjunction with a contest designed to promote awareness of Canadian Multiculturalism Day. The contest is open for students from junior kindergarten to grade 12. Students in kindergarten classes are asked to submit pictures (artwork), while students in elementary grades (grades 1-8) are asked to submit a picture

and a short piece of writing (250 words or less) on "What does Multiculturalism mean to you?" Senior grades (grades 9-12) are asked to submit a short essay (500-1000 words) in response to the same question. The closing date of the contest will be February 28, 2005. Students participating in the contest have the option of consenting to have their entry added to a secondary dataset. The secondary dataset helps researchers examine developmental differences in how students are able to conceptualize multiculturalsim. All analysis of the secondary dataset is subject to ethics approval and must fall within the parameters outlined by the informed consent associated with the contest.

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Location/Region: Qikiqtani (North and South)
Project Title: **Ice through Inuit Eyes**

Summary:

This project's objectives are to:
1) Gain a better understanding of the meaning of sea ice to Inuit culture and identity;
2) Better comprehend the traditional and contemporary Inuit means of characterizing sea ice variability;
3) Evaulate methods of collecting, analysing, and combining Inuit Qaujimajatuqangit and scientific knowledge; and,
4) Establish future collaborative research/monitoring needs.

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Location/Region: Kitikmeot
Project Title: **Ethnological Research on Traditional Knowledge and Environmental Management in the Inuit Society of Pelly Bay**

Summary:

The general aim of this project is to study and understand Inuit traditional knowledge, especially concerning the ecological environment and consider how to apply this knowledge to management of the environment. The project is composed of field research on the following parts;
1) Language,
2) Traditional technology of subsistence activities,
3) Traditional ecological knowledge of animals and plants,
4) Gender.
Based on this research, we hope to find a way to apply Inuit traditional knowledge to environmental management, and examine the possibility of Inuit traditional knowledge to contribute to environmental problems. I plan to continue the study on Inuinaqtun by formal interviews with several elders in order to learn the basis of traditional knowledge. A series of participant observations and interviews on hunting, fishing, gathering activities and food sharing practices in daily life will be done to understand the traditional technology of subsistence activities. The traditional ecological knowledge of plants and animals will be sought through interviews with several elders. Women's activities and social roles will be recorded and analyzed in order to study the role of women in the environmental management system of Inuit and the new political environment of Nunavut. We believe that audio, visual and written records on traditional knowledge and subsistence technology will make a significant contribution to cultural heritage, not only for Inuit but also for all of us. Furthermore, considering how to apply Inuit traditional knowledge to environmental management will contribute to solving environmental problems.

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Location/Region: South Baffin
Project Title: **Inuit Discourse and Identity after the Advent of Nunavut**

Summary:

The objective of this project is to understand what people living in Iqaluit think about the current state of the Inuktitut language, and what they think the future state of the language will be now that Nunavut has been created. How these reflections play a part in the construction and practice of Inuit identity in general, and, more particularly, of an Inuit-based territorial identity, will be examined. We want to know how the creation of a new political entity with an Inuit majority has influenced this majority's language attitudes. We presume that the advent of Nunavut has heightened the expectations of many speakers of Inuktitut in terms of the practical usefulness of their language, a fact that might help reinforce Inuit ethnicity. The research we propose results from a long-term collaboration between Université Laval and Nunavut Arctic College (Nunatta Campus), and it will involve the cooperation of Statistics Nunavut. It should play a crucial part in informing governmental and educational authorities about possible language policies. Data will be collected by way of interviews conducted by NAC students in Iqaluit. There will be a total of 45 adults, including 30 Iqaluit residents, 10 visitors from Igloolik and Kimmirut, and 5 individuals officially involved in language planning and development. Data will be correlated manually and compared with relevant scientific literature and language statistics (provided by Statistics Nunavut), in order to elaborate a model of the evolution of language attitudes and identity in eastern Nunavut, based on Inuit reflections and expectations.

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Location/Region: Kitikmeot, South Baffin
Project Title: **Socio-Economics for High Lake**

Summary:

The purpose of this study is to collect socio-economic information in relation to the potential impacts of the proposed High Lake mine. The information will be used to inform the environmental assessment of potential project impacts and of potential mitigation measures. Where applicable, the socio-economic information will be used to better understand how changes to the environment will affect residents of the Kitikmeot; as well as how the project will change the lives of Kitikmeot residents directly (e.g employment). The socio-economic program will begin by collecting and reviewing existing socio-economic information from Statistics Canada, such as previous environmental assessment reports, community economic reports, etc. The seven Kitikmeot communities will be subject to this evaluation. Once the baseline data is collected, the researchers will meet with the community residents, leadership and Nunavut organizations to confirm and up-date findings and discuss potential impacts from the project. The researcher will have community meetings in order to collect information on potential socio-ecenomic impacts. If required, there may be some one-on-one meetings. This information will ultimately be placed on the public registry for the environmental assessment completed by the Nunavut Impact Review Board. The data collected will be held in the offices of Gartner Lee. Environmental assessments are publicly open processess. It is not anticipated that there will be a need to maintain anonymity or confidentiality. The socio-economic information will be reported back to the communities through a series of workshops planned for October, January and March. It will also be reflected in the draft and final Environmental Impact Statement. The media for reporting will likely be written and video.

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Location/Region: Iqaluit, Pond Inlet, Pangnirtung
Project Title: **Inuktitut in Nunavut Communities**

Summary:

This project is investigating the role and importance of Inuktitut in Inuit communities. The information collected will be helpful for identifying ways in which Inuit communities can help preserve, protect and promote the Inuit language. The Government of Nunavut has stated that promoting Inuktitut is one of its priorities. Between 1999 and 2001, I collected information from Inuit youth about how they view the current language situation in Nunavut and their desires for the future of Inuktitut. I would like to come back to the communities where I conducted this research in order to present and discuss the results with interested community members. The meetings will have three purposes:
1. Communicate results back to the community;
2. Give research participants a chance to comment on these results;
3. Collect new information from a wider range of community members (the previous research only looked at Inuit youth).
Meetings will take place in Inuktitut and English, and all interested members of the community will be invited to attend. With the help of an Inuit co-researcher, I will first briefly present my research results and then invite comments from participants. Topics to be addressed include:
1) Usage of Inuktitut;
2) Importance and usefulness of Inuktitut;
3) Personal experiences of individuals who are not completely bilingual in English and Inuktitut;
4) Reasons why Inuktitut should be maintained and promoted;
5) Ways in which the community can be involved in promoting Inuktitut.
I will then analyze these results to better understand how the maintenance (or loss) of Inuktitut is affecting Inuit communities, as well as how "community" can be a privileged context for language promotion.

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Location/Region: North Baffin South Baffin
Project Title: **Inuit Adaptive Strategies and Environmental Conditions**

Summary:

The purpose of the proposed project is to learn from Inuit Qaujimajatuqangit how environmental conditions affect individuals and communities, how such conditions are managed, and how these conditions are currently changing. The project also seeks to identify recommendations on how to deal with these changes. This will be achieved through interviews with individuals in the community and focus groups. Locally hired assistants will have a prominent role throughout the research process. They will help by developing the methodology, guiding the interviews and focus groups, identifying important questions to ask, and interpreting and disseminating the results. The research will help to identify important issues and concerns, and fill an important knowledge gap regarding how communities deal with environmental conditions. The project output will consist of a series of reports documenting those environmental conditions that are problematic, identifying why they are problematic, and presenting locally relevant options to help manage these conditions. The findings will be communicated to key decision makers and will identify priority areas for policy development and furthur research. They will also be distributed to interested communities, groups, and organizations.

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Project Title: **Sustainable development and regional identity in Nunavut, Canada**

Summary:

The research project 'Sustainable development and regional identity in Nunavut, Canada' focuses on the relation between the inhabitants of Nunavut and their area, the newly formed region of Nunavut in the Canadian Arctic. The interest lies not only in their identification with the formal region but also - more fundamentally - in their relation to the physical environment of this Arctic region. The first aim is to analyse the different meanings the people of Nunavut (and others) give to the region. The related research question is how the inhabitants of Nunavut (internal actors) and outsiders (external actors) ascribe identity and meaning to Nunavut. Analysing place identity within the context of an indigenous hunter-gatherer society is particularly interesting in the light of (academic) discussions on the precise relation between cultural identity and regional identity. The second aim of this research project is to gain insight into the more practical relation between human activity and the natural environment by studying sustainable development. The Inuit of Nunavut - like other indigenous peoples worldwide - have adopted sustainable development as a development strategy that would allow them to (re-) gain a balance between the environment and human activities. This leads to questions such as how is sustainable development interpreted and implemented in Nunavut, and to what extent are these interpretations tied in with the cultural identity of the population? What are the implications for the area (natural environment) and the region? The starting point for this PhD research (started: June 2002) in Human Geography is the regional scale, which will allow integrated and interdisciplinary analysis. Qualitative and quantitative data will be collected by means of literature review, source material study, surveys and interviews. Part of the data will be collected doing fieldwork in Nunavut in 2005.

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Project Title: **Writing Inuktitut. Modernity of an aboriginal language.**

Summary:

This research aims at understanding the values associated with writing Inuktitut in the town of Iqaluit. I would like to investigate the linguistic perceptions of Inuktitut speakers about this medium of communication. For example, what does literacy mean today when compared to the very rich oral tradition in Inuktitut? What do Inuktitut speakers think about the use of literacy in English in their town? These are the kind of questions that would be discussed.

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Location/Region: South Baffin
Project Title: **Inuit Identity, Wildlife, Justice and Sustainability**

Summary:

I am hoping to better understand how people in Nunavut look at the relationship of survival, sustainability, culture, territory and identity. This understanding will then be used to look at approaches to wildlife management and community justice issues by governmental insitutions at the federal and territorial levels. The reason for choosing wildlife management and community justice issues is that both issues have been said to be important to Inuit before Nunavut was created, and both are said to be important now for reasons of cultural survival and Inuit identity. The questions we hope to learn more about are questions such as "Does government wildlife management do enough to reflect Inuit identity and knowledge?" and "Do community justice concerns get addressed by government in a way that respects Inuit views about sustaining Inuit identity?" If culture and place are critical aspects of sustainability, learning more about the way they connect in communities such as Cape Dorset may have important lessons for us all. Cape Dorset will be the focal point of this study. It is hoped that the research will be of value to people in Cape Dorset and other communities across Nunavut. It is also hoped that people outside Nunavut will learn from this research. People everywhere are trying to find paths to sustainability and it is my intention in doing this research to contribute to this search

for sustainable approaches wherever possible. We would like to come to Cape Dorset to do this work because Cape Dorset plays an important role in educating the world about Inuit identity through the artwork of local artists, and also people there are interested and involved in wildlife issues, in community justice, and in life on the land.

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Location/Region: Kitikmeot
Project Title: **Community Adaptation in a Changing Arctic Environment**

Summary:

The ultimate aim of this project is to assist communities in devising adaptation strategies appropriate for more sustainable development. The main objectives are:
1) To study the nature and speed of expected changes (environmental, economic, social, institutional and technological) and their integrated effects on development in Arctic communities;
2) To determine the extent to which past experience of development and community response will be useful in the future; and
3) To offer the above results to two communities and assist them in developing their adaptive management plans.
The third objective will involve working with two communities in Nunavut as partners to assess expected local changes and potential adaptive responses. Community participation is critical in expressing their concerns and information needs, in conveying their knowledge of local impacts and in defining options and thresholds for future development. The intended outcome for the community is both a plan for the present and a process for future decision-making as new issues arise.

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Location/Region: North Baffin
Project Title: **Inuit practices and representations of the night: linguistic and anthropological features**

Summary:

This project, supervised by Michele Therrien (Department of Inuit languages and Culture from the Institute national des langues et civilisations orientales, Paris, France), constitutes the subject of the PhD of Guy Bordin. The night is universally the period of the daily cycle that man devotes largely to sleep. However, if all societies are subjected to the alternation of day and night, the peoples living at high latitudes experience particular situations with, as first approximation, a (quasi) continuous daylight summer and a long dark winter. This raises a number of questions among which are the following ones: for the Inuit, what does "the night" mean in the summer? When, where, how and with whom does one sleep when the sky (almost) never darkens? When people do not sleep, what do they do during this continuous clarity? Conversely, if it is roughly always dark in the winter, is it still always "the night"? How do the sleep practices change in relation to those of the summer? What about other night activities? From one season to another, do words always express the same concepts? Obviously the latitude where people live will strongly contribute to the perception of night. Research will be organised around the following items:
a) A bibliographical survey on the mythical, scared and individual night experiences (presently being carried out here at home);
b) An ethnography of the night practices, sleep habits, sleep-related phenomena (eg. recording of dream activity and its related manifestations such as aqtusiniq), and other night activities;
c) Questioning the "night" environment in its variability (the polar day, the winter night, the daily night, the northern lights, etc);
d) The investigation of the semantic fields of the night, of its practices and representations (what do we learn from the language?).
To cover various situations, the work should be carried above and below the Polar circle and at different seasons. One period was already spent in Iqaluit and Mittimatalik from December 2002 to end March 2003. I wish now to stay at Mittimatalik during the summer.

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Location/Region: Igloolik
Project Title: **Exchange Programs as a Means of Achieving the Attitudinal, Skills and Knowledge Expectations as Found in Ontario / Nunavut Curriculum**

Summary:

As a Science professor in the Faculty of Education at Nipissing University in North Bay, Ontario, it is my interest to participate in a two-way exchange program in order to collect data regarding the development of attitudes, skills and knowledge among students and teachers. During and after the exchange process, I intend to collect and analyze data through a variety of means including informal and formal discussions/ interviews and written journals. It is my intention to publish this information in "Professionally Speaking," an educational journal distributed by the Ontario College of Teachers. I am also interested in publishing in similar journals that are available throughout Canada.

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Location/Region: Nunavut Wide
Project Title: **Leadership Self-Awareness for Nunavut Educators**

Summary:

I will cite past research on EQ and on the VSM cultural dimensions work. Both are used extensively and have a large body of accumulated data that substantiate the validity of the tool and provide comparison of results. I will note that cultural data of this kind is not available for Nunavut, and that a baseline will be one objective of the present study. I will explain the connection between leadership and self-awareness, citing sources studied in the leadership program and any others I turn up. Once this connection is established I can explain how the two tools I'm using contribute to self-awareness. The EQ tool provides feedback about relative strengths in various emotional categories, which therefore directly provides self-awareness and identifies areas for teachers to focus on for future improvement. I will explain some of the cross-cultural issues southern teachers face when moving to Nunavut to teach. This will establish the need for self-awareness of

cultural dimensions as part of professional growth for teachers, and their ability to meet the needs of the students and community (and therefore increase their ability to lead).

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Project Title: **Community Responses to Tourism Development in Canada's North**

Summary:

This project explores the critical questions of how to achieve tourism development in the Canadian Arctic that is both sustainable and acceptable to local communities, and how to engage citizens effectively in the public planning process. Given the predictions that Arctic waters could be substantially free of ice by 2050, the research focuses on the effects of increasing tourism and shipping activity on Arctic communities. The research aims to explore community responses to cruise tourism using a modified Public Participation Geographic Information Systems approach (PPGIS).

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Project Title: **Modernity, agency and cultural identity of young Inuit women in Iqaluit, Nunavut**

Summary:

This research will focus specifically on younger generations of Inuit women and will research their experiences of cultural identity on both an individual and political level. Although I certainly do not overestimate the scientific and social relevance of this research project, I do at least hope to make a modest contribution to an Arctic scholarship that more fully takes into account the complexities and dynamics of everyday Inuit life, especially from a women's perspective.

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Location/Region: Kivalliq
Project Title: **Elder -Youth relations in Arviat**

Summary:

The proposed research will involve exploring the current state of Elder-Youth relations and the historical transitions that this relationship may have undertaken. Arviat was selected by the researchers because of its reputation for being a traditional community, and because it was a more economically viable option for the researchers. The resaerchers are Hibret Nega and Ashley Sisco of the University of Western Ontario and their undergraduate thesis will be advised by Regna Darnell. They are not linked to any organizations or programs in Nunavut. The thesis will include secondary and archival research. The fieldwork component will involve interviews with approximately twenty to thirty Inuit residents of Arviat, ranging in age from fifteen to eighty. All interviews will be conducted with interviewees who have signed a letter of consent and understand their rights as participants.

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Location/Region: Kitikmeot, North Baffin
Project Title: **Co-operative Membership and Globalization: Creating Social Cohesion through Market Relations**

Summary:

The purpose of the research is to explore the nature of co-operative enterprises in northern communities and how notions of membership, identity, community engagement and co-operative membership influence, and are influenced by, the unique characteristics and experiences of Inuit, First Nations and Metis cultures. Questions of membership and identity can be understood in historical, sociological, or political terms, but for co-operatives they also have a critical economic dimension. Co-operatives need to know

who their members are in order to serve them. A clear understanding of identity is essential to marketing and economic success.

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Location/Region: South Baffin
Project Title: **A study of Traditional and Colonial Conceptions of Space and Time among the Inuit of Baffin Island**

Summary:

The goals of this project are to:
1) Attempt to determine how the relative imposition of settlement life on Baffin Island has altered traditional, nomadic experiences of time and space among the Inuit of that region; and
2) Try to specify how different, if not competing, spatial and temporal experiences of being "in town" and being "on the land" are negotiated through daily social practices within their contemporary communities.
This research will provide the basis for a socio-political analysis of the role that technologies of time and space have played in the colonial governing of that region. Field research will be conducted in two settlements on Baffin Island: Iqaluit, Nunavut's largest city and capital, and the hamlet of Pangnirtung. Pangnirtung will also serve as a point of departure for conducting interviews while traveling on the land with different local hunters and fishers. The main source of information collection will be obtained through oral interviews conducted with elders, teachers, mothers, government workers and children from the communities. A summation of the collected responses will be presented to the main participants, who will also be asked for their final conclusions (on both the information and the process). The information gathered from this research will serve as the basis for a chapter of the researcher's dissertation.

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Project Title: **Involving Inuit Youth and Inuit Knowledge in the Management of Sirmilik National Park**

Summary:

The proposed project will involve high school students and elders in sharing, documenting and discussing their knowledge of the land and land-based activities around the community of Pond Inlet, and Sirmilik National Park (SNP) in Nunavut. The initiative will cooperate with the Parks Canada project, using Inuit knowledge in the management, research and monitoring of Nunavut national parks, and will serve as a joint community-development and research project. The community-development portion of the project will affirm the knowledge and interest that young people have in Inuit traditional knowledge, promote continued knowledge transmission, introduce youth to Inuit knowledge research, and engage them in documenting Inuit knowledge for use in the community and SNP. The research component of the project will consider the current state of knowledge amongst young people and provide direction for programs that encourage them to acquire further knowledge and research skills. It will also consider how the knowledge that is shared during the project can contribute to managing SNP.

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Location/Region: Iqaluit
Project Title: **Authority, identity and power: An anthropological approach to the contemporary Inuit discourse in the Canadian Arctic.**

Summary:

This research project is meant to analyse the role of neologism (creating vocabulary) in the Inuit context, especially regarding political discourse, in order to understand matters of authority and identity. It involves an analysis of changes in Inuit formal and informal discourses with a focus on neologisms. The collection of writings that the project wants to develop is a glossary with an analysis of changes in Inuktitut political terms (comparative semantic analysis). In practical terms, the fieldwork project will include meetings with:

1) Inuktitut-English translation teachers from the Nunavut Arctic College and professional translators;
2) Local and territorial political representatives as well as Inuit organisations since they are the ones who handle the political discourse and make use of neologisms; and
3) Individuals from various backgrounds and age groups, in order to develop a perception of the public's opinion on politics and language.

Name: Egeni, Camilius
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Project Title: **GN Training Programs Evaluation**

Summary:

This study will analyze Government of Nunavut (GN) training programs for the purpose of determining whether the current training programs meet both GN and staff needs. Training is viewed as valuable in the building of a sustainable workforce within GN. Senior management could use the report findings and recommendations for strategic planning purposes including allocation of resources, training program planning in Nunavut, and to meet Inuit Qaujimajatuqangit (IQ) (traditional knowledge) requirements as outlined in the Bathurst Mandate on continuous learning. The report may be valuable for human capital planning and maintenance within GN operation.

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Project Title: **Health Behaviour of School-Aged Children**

Summary:

The Health Behaviour in School-Aged Children (HBSC) study, sponsored by the World Health Organization (WHO-Europe) and the Public Health Agency of Canada, is the seventh such study and the fifth Canadian one. The first Canadian HBSC survey was conducted in 1989-90 with 12 countries; the 2005 survey will be conducted with 38 countries. The aim of the 2005-06 HBSC survey, as in the previous surveys is as follows: to examine and understand the attitudes and behaviours of young people in Canada; to

record changes in these behaviours and attitudes over time; to examine the relationships between various factors in the lives of young people and these attitudes and behaviours; to share these findings with those who are concerned with youth issues; to promote good health practices and influence policy around youth and school health in Canada and other countries; to draw international comparisons between youth in Canada and others in 38 countries around the world that do the same study.

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Project Title: **Creative Writing, Publishing and Empowerment of Inuit Adult Learners**

Summary:

This project will study how writing and publishing their own experiences and stories increases the empowerment of adults who are just beginning to read and write. My proposed research project will take place in Baker Lake, Nunavut with Inuit adult learners. It will entail development of a curriculum for a creative writing course with Elders and students. I will also teach the course in conjunction with the Elders. After the course, an anthology of the learners' writing will be published and launched in the community. The course will be taught in English, as this is one of the languages of the Adult Education Centre in Baker Lake, Nunavut.

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Location/Region: South Baffin
Project Title: **Holistic Sewage Management in Arctic Communities**

Summary:

For many arctic communities' a sewage lagoon is presently the most common method of managing sewage. The community of Panniqtuuq, Nunavut does not have enough flat

land for an efficient sewage lagoon, and therefore is one of the few settlements to have a newly built sewage treatment plant. A number of significant problems have emerged with the operation of this plant, and as one might expect, over time other communities will need similar plants to deal with the expansion in both settlement size and population. Changing legislation, to which the new government of Nunavut is legally bound, is now forcing the implementation of regulations that these communities cannot hope to achieve in this present situation. A holistic approach, which accounts for all the diverse factors involved in the management of sewage that can be sustainable and welcomed by each community, is needed. The limitations that are inherent in the current process and research style must tolerate alternative processes and principles. Such a holistic approach would consist of examining environmental concerns, and the potential positive or negative impacts on the environment. Economic factors would look at the cost associated with a project. Social issues involving the community will also be reflected in the decision making process. A balance can be obtained through realizing that all parts of society need to be examined, and not just a focus on the obvious problem. By finding solutions and understanding sewage treatment from a holistic approach, and involving the community, a comprehensive program that meets the needs from a social, economic and environmental model could be used in future projects.

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Project Title: **Inuit Specific Risk Assessment Model for Offenders**

Summary:

I propose to facilitate the creation of an Inuit Specific Risk risk assessment model for offenders in the justice system. Risk assessment is a tool used by the Department of Justice to measure an offenders risk to re-offend and also contributes to the creation of their rehabilitation program. The model/tool currently in use is based on Southern standards of risk that does not take into account Inuit cultural differences and the unique factors exclusive to Nunavut. The model that I propose would be a culturally specific measurement of risk to re-offend that would be significantly more appropriate than the one currently in use by the Government of Nunavut's Department of Justice. Unfortunately, the current system is creating an unjust measurement for the offenders risk to re-offend at all points in the justice system. An Inuit specific tool, designed for and by Inuit could be used at every point of contact from the courts, jail and/or probation services. The proposed model would ensure that all criminal justice personnel take into account all aspects of an offender's life in a holistic manner and not exclusively as an 'offender'. It deviates from generic risk assessments in that it creates new variables based

on consultation with communities and elders that focuses on reintegration. It will emplasize the importance of cultural relationships, considers history of residential school and stresses the importance of corrections personnel understanding the true history of colonization, oppression, racism and the impact these factors had on Inuit offenders. It would compel the courts, probation officers and correctional officials to be more sensitive to Inuit history, culture and differences that are for the most part overlooked in the justice system today. For offenders, this model would allow them to express themselves in a manner that is not currently considered when using Southern risk assessment tools. The creation of this model will be based on Inuit Qaujimjatuqangit and will involve as many communities as possible.

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Location/Region: South Baffin and Keewatin
Project Title: **Persuing a Dream: Inuit Education in the Qikiqtani Region of Nunavut from 1980-1999**

Summary:

In partnership with the Nunavut Department of Education and Nunavut Arctic College, and with a particular focus on teacher education, professional learning, and leadership development in the Qikiqtani Region of Nunavut, this research prepartes the ground for a comprehensive investigation of the decolonizing best practices that contributed to the development of Inuit education from 1980-1999. This project is based on the premise that successful Inuit education requires an Inuit political consciousness and the reclaiming of Inuit culture as a foundation for teaching and learning in classrooms. In decolonized Inuit schools, Inuktitut becomes the first language of instruction in a bilingual education system, Inuit parents are integrally involved in educational decision making, and above all, Inuit teachers hold the majority of teaching and leadership positions in the school system. Many of these elements were established in the educational system in the Qikiqtani Region of Nunavut from 1980-1999, but have yet to be researched, adequately documented, and shared with the wider educational community in Canada. As a consequence, much of this valuable history, which represents progress towards Inuit ownership of their educational system, is now in danger of being lost. Conducted by a team of two Inuit educators and three emerging Qallunaat (southern Canadian) scholars who lived and worked in the Qikiqtani Region for many years, the research uses qualitative, participatory processes to involve Inuit graduate students and educational leaders in building a long-term research agenda. An Inuit Advisory Committee will guide this research project and ensure that it is ethically and culturally

appropriate. This research enables long-term Inuit leaders to share and document powerful stories of their success through co-authored reports, journal articles, and publiction on decolonizing best practices in Inuit education. The long-term research agenda emerging from this research will enable Inuit voices to inform the field of Indigenous education.

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Number in party: 10
Location/Region: Kitikmeot
Project Title: **IQ for High Lake and Ulu**

Summary:

The purpose of this program is to collect Inuit Qaujimajatuqangit (IQ), or Inuit traditional knowledge, in the Kitikmeot regions west of Bahurst Inlet, where the proposed High Lake and Ulu mines are located. The information collected will be used to inform the environmental assessment of potential project impacts and of potential mitigation measures. The IQ will help "flesh-out" the picture of the biophysical environment by providing long-term data to the two year scientific work being done. Wolfden is aware of the recently completed IQ study undertaken in the Kitikmeot and has been in discussions with the Kitikmeot Inuit Association. It is currentlyour understanding that access to that database is contingent on release agreements being worked out between the researchers and the KIA. It may be a year before that IQ information is available, hence the requirement for Wolfden to conduct a separate study. The IQ program will include the following:
1) A collection and review of IQ already in the public domain
2) A site visit to High Lake by Elders and Gartner Lee personnel in early August 2004
3) An IQ workshop in Kugluktuk in late August 2004 with selected elders from Kugluktuk, Bathurst Inlet, and Cambridge Bay, which are the communitites nearest to the mining project
4) Integration of the results of this work with the biophysical and engineering programs providing baseline information for interpretation of results.
Wolfden Resources Inc. and Gartner Lee Limited have prepared an IQ approach that addresses matters of data storage, use, ownership, access, intellectual property rights and participant consent. The IQ and its use will be reported back to the communities through a series of workshops planned for October, January, and March. It will also be reflected in the draft and final Environmental Impact Statement. The media for reporting will likely be written, mapping and video.

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Project Title: **Inside School Administration in Nunavut: Three Women's Stories**

Summary:

My research will investigate the factors that motivate Inuit women to become principals in Nunavut schools. In this study I would like to interview three Inuit educators from Rankin Inlet and Baker Lake about school administration. I will audiotape the interviews with each of the three women at a location of their choosing. Each of the participants will have the opportunity to respond in Inuktituk with an interpreter. I will listen for common themes that emerge in what they say. These themes will be used to create the final report. Their stories will be presented anonymously and collectively, to ensure confidentiality.

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Location/Region: Nunavut Wide
Project Title: **Polar Bear and Inuit: A Multiple-Use Resource and its Socio-economic Implications in Nunavut**

Summary:

The main purpose of this research is to understand how Inuit have changed their views and management of polar bears since the introduction of sport hunting and conservation concerns in recent years. The first question in this research looks at how polar bears were traditionally managed by the Inuit. Were they viewed as subsistence-cultural resources available to all local people with few rules governing their use? The second question deals with how Inuit now balance outsider interests in polar bears with their own.

Strict management rules are now in place, which can both include and exclude outsiders from using polar bears as a resource. However, to what extent is the current system susceptible to outside influences from groups such as sport hunters and conservationists? This project will explore how the Government of Nunavut rules reflect the interests of sport hunters and conservationists while trying to maximize Inuit use and benefit from polar bears. The main objective is to create a framework to understand the evolution of polar bears management. Other researchers have studied common property management in other situations and have developed a framework to explain why some forms of management work better than others. I used their framework to study Native peoples' resource management in the Amazon Basin as part of my Master's work. I would like to test and possibly modify the framework to explore the multiple uses of polar bears by Inuit. It is hoped that this project will be useful in several ways. First, this project will record the history of changes in polar bear use since the introduction of the sport hunt. Second it will provide information to Inuit about potential benefits and costs related to changing the current management situation. Native peoples around the world are struggling to maintain control over their traditional resources and to use these resources in new ways to support their livelihoods. This research will provide a framework for studying natural resource management that is focused on Native people. I hope that other groups will be able to learn from the experiences of the Inuit and that this will help them to manage their resources in a way that is culturally acceptable and sustainable.

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Location/Region: Kitikmeot
Project Title: **Iqaluiktuuq Project 2005**

Summary:

The Iqaluiktuuq Project is a study of the cultural history of the Iqaluktuuq area near Cambridge Bay, Nunavut. In July of 2000, the Kitikmeot Heritage Society (KHS), a group that includes many elders from Cambridge Bay, began a collaborative oral history / archaeological research project with the University of Toronto. This project has been carried out annually since that time. The Iqaluktuuq Project combines the best of a community-based research and a careful academic research approach to this important group of archaeological sites. Research planned for 2005 will involve only one day of interviewing regarding archaeological sites at the Iqaluktuuq / Ferguson Lake site and several sites in the Ferguson Lake area. A single elder, Frank Analok, will work with Archaeologist Max Friesen to aid in the interpretation of archaeological features. They will travel to these various sites by helicopter and conduct interviews at each site. Dr.

Friesen will have questions about the identification of features, and questions about how the archaeological features found thus far bear on Inuit history in the area.

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Location/Region: High Arctic
Project Title: **Elders Observations of Narwhal Anatomy**

Summary:

Elder observations of narwhal anatomy and behavior are valuable for my research on the tusk of the narwhal and complement other scientific studies. I would like to continue my work asking elders questions about the narwhal as I have a deep respect for their insights, and find that many of their observations are more accurate than published scientific accounts. Rather than merely take this information for publication, I would like to write an article that demonstrates the value of taking the time to ask community elders about their experiences and observations, illustrating how this information has proven invaluable to the body of knowledge known about the narwhal.

I will talk with elders, acknowledged by the community for their experience about the narwhal over a one week period in Pond Inlet during the summer of 2005; timing may be altered if an elder's health becomes an issue or additional information is needed. This community was selected for its elder's extensive experience and hunting of the narwhal. Questions have been prepared and answers will be transcribed from audio recordings. Results from the work will only be used with permission from the elders and under conditions prescribed by them. The intellectual property rights will always be maintained by the elders with me having permission to use gathered information for a combined social and scientific study. Any publications or use of information in another format will be accessible to the communities through copies made available directly to them. Copies of the recorded information will be given to the Nunavut Research Institute and the Rebecca P. Idlout Library at Pond Inlet after completion of this study for additional use or access by any interested individual. At all times during the course of this work, respect and attention to accuracy will be maintained as I value their knowledge and trust in my ability to use it wisely.

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Location/Region: South Baffin
Project Title: **Inuit Voices in the Making of Nunavut**

Summary:

This research aims to collect, publish and disseminate the life stories of five Inuit elders who played an active socio-political role during the recent and contemporarty periods (since 1945, but more so since 1970) in Nunavut and the Canadian North. These Inuit are the following:
1) Abe Okpik;
2) John Amagoalik;
3) Mary Panirgusiq Cousins;
4) James Arvaluk;
5) Tagak Curley

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Number in party: 2
Location/Region: North Baffin
Project Title: **Inuit Qaujimajatuqangit about Snow Geese, Arctic and Red Foxes and the concept of Ecosystem Integrity**

Summary:

Inuit have developed, through their hunting, fishing and gathering activities, extensive ecological knowledge on arctic ecosystems. In recent years, there has been an increased interest in integrating this Traditional Ecological Knowledge (TEK) with "western science." In this context, Parks Canada established a first priority commitment to use TEK and increase the involvement of Native peoples in management of the national parks. More specifically, the 2001 Sirmilik National Park (SNP) Resource Description workshop concluded that collection and integration of TEK related to birds, wildlife behaviours and polar bear denning areas should be a priority. To date, only a small

portion of SNP has been thoroughly investigated by scientists. Consequently, TEK held by members of the community of Pond Inlet, who regularly use SNP, present a good opportunity to increase knowledge about the ecosystems found within the park. In response to the indentified priorities, the study aims at gathering Inuit knowledge about:
1) The Snow Geese, the Arctic Fox, and the Red Fox (behaviour, distribution, population trends);
2) The concept of ecosystem integrity, as perceived by Inuit travelling on the land (how do they define a healthy ecosystem, what are the values of a healthy ecosystem to them, does the health of the land change through time).
Through the project, the investigator also aims at building a framework for increasing the use of Inuit knowledge in the management of SNP.

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Location/Region: Kivalliq
Project Title: **Understanding the tundra landscape surrounding Aberdeen Lake, Nunavut, through the eyes of an Inuit elder, John Killualark**

Summary:

The main goal of this research project is to document the place names, stories, legends and to gather Inuit ecological knowledge of the Aberdeen Lake area. This project aims to bridge the gap between the elders and the youth by integrating traditional knowledge with modern data gathering tools familiar to most youth, such as global positioning systems (GPS) and computers. The information gathered from this project will be documented in thesis format, as well as in video or CD format. Elder John Killulark is the primary subject and is knowledgeable of this area. This is the area where his family grew up before moving to the community of Baker Lake in the early fifties. He feels it is important the knowledge is documented so his family and other people know of its history before it is lost forever. The primary research will take place on the land at Aberdeen Lake. The primary method of travel will be by boat up the Thelon River, where Elder John Killulark will explain the areas in detail. Methods of documentation will be recorded on maps, tape recorder, and video recorder. Two other trips possibly by chartered aircraft will take place in early June and early September. The purpose of these two trips are to trigger memories associated with the landscape before the major trip by boat, and to gather information in different times of the season.

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Project Title: **Inuit Music: The Historical Relationships and Cultural Traditions Shaping the Song Repertoire of Three Bands of Caribou Inuit Living in Arviat, Nunavut.**

Summary:

Few studies of indigenous music have yet explored the way musical practices articulate the diversity and complex social networks within a single community. I will conduct a comparative study of the historical relationships and cultural traditions shaping the song repertoire of the Ahiarmiut (Inland Inuit), Arviamiut (Sea Inuit), and Padlirmiut (Nomadic Inuit) living in Arviat (previously Eskimo Point), Nunavut. These three bands of Caribou Inuit, each with their own traditions, language, and history, were brought together in Arviat as a result of a Federal Government relocation program in the 1950s (Tester and Kulchyski 1994). Musical production has been influenced by the amalgamation of the three groups of Inuit as well as by non-Inuit media and live performance. I will examine the extent and type of change, as well as the ways music functions to distinguish each group or create relationships between them, since the relocation of Inuit to Arviat in the late 1950s. My study will take into consideration earlier moments of dramatic change, such as the histories of missionization, beginning in the 1920s, that led to different denominational affiliations for the three groups, and more recent sociopolitical events such as the establishment of Nunavut as the newest territory of Canada in 1999.

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Project Title: **Games and Songs in Inuit Societies of the Canadian Arctic**

Summary:

The project consists in studying the different forms of "games" in Inuit societies of the Canadian Arctic, before and after life in settlements. I plan to focus primarily on traditional games like ajaraq, ajagaq, and inugaq, as well as on other games that used to

be performed with songs. My purpose is to study the kind of songs that used to be sung, the stories they referred to, and to look more generally at the way songs are embedded in those games.

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Location/Region: North Baffin
Project Title: **Documenting Cornelius Nutarak's Knowledge of Polar Bears**

Summary:

Over the last several months, researchers working with Parks Canada's Inuit Knowledge Project have been in contact with Mr. Cornelius Nutarak, a respected elder in Pond Inlet, to document his knowledge of Inuit land use and environmental changes through his lifetime. Throughout his lifetime, Mr. Nutarak has been extensively involved in research activities (namely of archaeological sites in the Pond Inlet area) and has kept a journal documenting his research activities and daily observations of life and environmental change in the Pond Inlet area since the early 1960s. Mr. Nutarak attended two workshops designed to inform the Pond Inlet Elders Committee (Feb 27 -28 and July 20, 2005) about Parks Canada's Inuit Knowledge Project. Mr. Nutarak expressed an interest in working with Parks Canada's Inuit Knowledge Project to design a project aimed at documenting his observations of environmental change in the area of Sirmilik National Park.

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Number in party: 7
Location/Region: South Baffin, Kivalliq and Kitikmeot
Project Title: **Surveillance and management of climate change impacts in the north: implications for northern public health policy and infrastructure - Case Study Approach**

Summary:

The project will assess several aspects of the ability of nerthern health and environmental organizations and departments to identify, monitor, manage and adapt to the various impacts of climate change and accelerated economic development on the health and lifestyles of Northerners. Through this review, the proposed project will strive to integrate information from other research projects and analogous situations, identify policy options and make recommendations to strengthen adaptation strategies and their supporting infrastructures. Specifically, this project will address five research goals: 1. Assess the adequacy of present surveillance tools to support northern managers' ability to identify and monitor acute and chronic diseases, exposures, and other health determinants related to climate change and economic development impacts; 2. Assess the applicability and use among northern managers of current risk management frameworks and knowledge transfer processes, as well as their tretment of potential impacts of climate change in the North and make recommendatios to improve comprehension, use and applicability; 3. Identify policy implications for surveillance infrastructure, risk management framework and tools, and sustainable development policies for sound interdepartmental and intergovernmental cooperation, at the national and international levels; 4. Propose, through regular interaction with stakeholders, options and recommendations on the above mentioned topics to develop capacity-building initiatives; 5. Initiate and propose pilot projects for upgrading the public health infrastructure in the areas of I chronic diseases, ii infectious diseases, iii environmental and occupational health, iv injuries and disaster preparedness; as they relate to potential climate change. Presently I will be investigating eresearch goal #1

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Location/Region: Cape Dorset, Igloolik, Pond Inlet, Arctic Bay, Clyde River
Project Title: **Survey of Air Change Rates in Inuit Housing in Baffin Region, Nunavut**

Summary:

Inuit infants in Baffin Region, Nunavut, have the highest incidence of severe lower respiratory tract infections, including bronchiolitis and viral pneumonia, needing admission to hospital in the world. Prior studies have not found a clear reason for this, such as aproblem with the structure of the lungs or with the immune system. In the winter of 2003, we carried out a pilot study in Cape Dorset, where we found that some houses had reduced ventilation rates, which might increase the risk that babies develop viral infections. In the present study, we wish to examine air quality and ventilation in a larger sample of Inuit housing in Baffin Region. During the cold weather months, a researcher will visit the participants' homes and air quality will be measured in each participant's home. We wish to target homes containing infants and children 2 years of age or younger, but other homes will not be excluded. We wish to perform indoor air quality measurements including nitrogen dioxide, airborne nicotine, and carbon dioxide measurements. This will be performed using passive monitors. We will measure ventilation and air exchange rates using a device which emits a safe, tracer gas in the house for a week, and a passive sampler, which measures the concentration of this tracer gas over the one-week period. The tracer gas is the same one used in refrigerators, and is completely safe. We will also perform brief home inspections, and administer brief respiratory health questionnaires to determine which of these infants have been admitted to hospital with brochiolitis. We will record details about the age of the houses and any renovations they have had using data supplied by the Nunavut Housing Corporation. At the end of the winter, health visit data will be obtained from the local nursing stations and Baffin Regional Hospital in Iqaluit, Nunavut. Information from this study will be used to determine whether reduced ventilation is common in Inuit houses in Baffin Region Nunavut, and to see whether babies in houses with less ventilation are more prone to catch bronchiolitis and pheumonia. If decreased ventilation is common in these houses, more research may be planned in the future to see if improving ventilation in these houses will decrease the risk of lower respiratory traction infection in Inuit babies.

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Location/Region: South Baffin
Project Title: **In My Room "Iqlutaq": A youth case study of problems and solutions in Kinngait due to lack of adequate housing stock and inadequate income**

Summary:

The purpose of this case study is to gain information and current knowledge on youth understanding of homelessness (lack of housing, inqdequate income and solutions). Acquiring this information will provide a better understanding of homelessness in Kinngait, while also bringing to our attention housing and social policy areas which may be enhanced in the future. The collection of data to be used in this study will take place over several months between March 2005 until December 2005. A variety of research strategies will be used (including action research training for youth, questionnaire, surveys of various youth and surveys of particular interest groups). Respondents are asked to complete audiotape questionnaires regarding their views on the implications of the lack of housing, inadequate income and their solutions

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Location/Region: Kitikmeot, Kivalliq
Project Title: **Climate change, key traditional food species and community health in Nunavut**

Summary:

The proposed research is to identify changes in availability and access of key food species in two Nunavut communitities, Kugaaruk, and Naujaat and to project nutrient intake and health impacts. We will also help the communities to create an adaptation plan. Our study aims to understand how changes in key species abundance and access, is related to health (focused on nutrient intake, but also concerning social, mental, spiritual,

and aspects of health). Are the hunting seasons longer of shorter? How does this change the number of animals harvested in each community? How does this affect community distribution of food and thus nutrient intake and overall health? These are some of the key questions guiding our study. The study will involve several days of interviews, use of maps, and focus groups with informed individuals from the communities in the spring of 2005. This project will be carried out in collaboration with the communities at all stages of the project to ensure correct representation and appropriateness of knowledge shared. A preliminary workshop to be organized by the Inuit Tapiriit Kanatami in winter of 2005 will be the basis for what environmental change is currently affecting the community. This preliminary visit will allow us to identify community concerns and focus our hypotheses and our research tools in this direction. The results of our study will be vital in developing an adaptation plan to achieve required nutrient levels that promote optimum health in the face of climate change. Furthermore, it will bring to light the link between overall health and traditional key food species in each community.

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Location/Region: South Baffin
Project Title: **Healing the social body: A community-based approach to mental health policy.**

Summary:

I would like to gain a better understanding of community perspectives on how to understand and promote mental health and prevent mental illness. Particularily, I would like to better understand the role that cultural concepts of mental health, connections to nature, identity and traditional values play in mental health and the prevention of mental illness. This can be used to examine the governments approach to address mental health issues to see if it reflects Inuit views and knowledge. This research will use qualitative methodology in conjunction with official statistical data. I hope to do interviews with community members, public health officials, nurses, doctors, psychologists and psychiatrists.

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Location/Region: Kitikmeot
Project Title: **What is the experience of individuals, families and community members towards FASD prevention and intervention with respect to the FASD pilot project in a remote inuit community?**

Summary:

This research will use a case study approach to understand the relevant strategies and steps taken to address FASD and implement a coordinated community based approach. Case studies provide an opportunity to document, reflect and share valuable information for future community development. The FASD Pilot Project will serve as the case study to explore individual and community experiences. Interviews will be conducted with key informants (6-8) which include community members and stakeholders. It is the intent of this research to gain insight into the process and relevant strategies towards FASD prevention and intervention. Information gathered to highlight strengths, barriers, obstacles, cultural and spiritual environments that are present throughout the process. The significance of the findings will provide an opportunity for community members and stakeholders to have a voice and share information about what worked, what was learned, and needs to happen. This information will provide a guide towards development of culturally relevant programs for other communities in Nunavut. The information compiled in an interactive CD ROM which will be translated to be shared as an educational tool with other communities who would like to address FASD.

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Project Title: **The study of Congenital Heart Defects in a Northern Population**

Summary:

Congenital heart malformations is a common congenital malformation, diagnosed around the world in about 1% of live births. This is also true in the Canadian Arctic, where in Nunavik, the rate of infant mortality is 5 times that of non-aboriginal Quebec and 2/3 of the neonatal deaths are due to birth defects. In Nunavut and Nunavik , a 5 year cohort of more than 2,500 Inuit births occurring between 1989-1994 evaluating the rates of birth defects, confirms that congenital heart defects, specifically septal defects (VSD's) and atrial septal defects (ASD's) were nearly 5 times more frequent than in other Canadian populations. Children and their mothers will be invites to participate in the study which will compare vitamin levels of the mothers, genetic factors of mothers and children with controls (the mothers's sisters). As well, dietary histories of the cases, controls and other women of childbearing years will be assessed for intake of nutrients important in fetal development . Histories of pregnancy exposures will be compared between cases and controls.

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Location/Region: Nunavut Wide
Project Title: **The Emergence of Gestational Diabetes Mellitus and Type 2 Diabetes Mellitus Among the Inuit of the Baffin Region**

Summary:

The objectives of the current proposal are to determine the prevelance of diagnosed diabetes during pregnancy and type 2 DM in the Baffin Region; and to identify the prevalence and determinants of impaired glucose tolerance (IGT) and other risk factors

for type 2 DM among the Inuit in 2-3 communities in the Baffin Region. The information will provide an inuit-specific context of the determinants and prevalence of diabetic risk factors upon which to develop health promotion and prevention strategies. Also, the information from the initial screening will help determine the need for diabetes screening and the most cost-effective screening policies that could be implemented throughout the Territory. The first component of the study represents a case-ascertainment and a capture-recapture analysis to examine completeness of case ascertainment. The capture-recapture method requires two independent data sources and the ability to identify matches based upon personal identifiers. Cases indentified through community screenings and hospital laboratory records will be used in a capture-recapture analysis to estimate the true number of cases (with confidence intervals) for the Baffin Region. The minimum amount of data required is a laboratory result indicative of type 2 diabetes or impaired glucose tolerance and personal identifiers to ensure that each case is counted only once and to enable a capture-recapture assessment of completeness of case ascertainment. For the second component of the study, which is the community health screening, the information collected will include systolic and diastolic blood pressure, fasting plasma, glucose and insulin, fasting lipids, an oral glucose tolerance test and measures of weight, height, circumference, and body fat distribution, physical activity and diet. Participants's gender, age, and smoking status and family history of diabetes and heart disease are also considered important for the screening.

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Project Title: **Pangnirtung Medical Practices Study: Forming a history of practical care**

Summary:

The purpose of the field study to be conducted in Pangnirtung, Nunavut during February-March 2004 is to engage in oral history collection concerning the nature and extent of medical care practices within the Inuit traditional approach to disease. This study will focus on the practices common to the Inuit of the Cumberland Sound region as described by the people of the community of Pangnirtung.

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Location/Region: Nunavut Wide
Project Title: **Qaujivallianiq Inuusirijauvalauqtunik suicide follow-back study**

Summary:

This study will attempt to learn more about the risk factors and preventive factors specific to suicide by Nunavummiut by conducting extensive, semi-structured proxy interviews with family members, friends, and acquaintances of persons who die by suicide in Nunavut. For each death by suicide, similar interviews will take place for a suicide attempter and a case control (someone who has never attempted suicide) matched to the case control by community, ethnicity, sex and age cohort. Interviews will only take place in communities where deaths by suicide have taken place and possibly in the home communities of persons who have died by suicide in other communities. The methodology will be that of the McGill Group for Suicide Studies, which has extensive experience in the field. The research instruments will be those of the McGill Group for Suicide Studies, modified for use in Nunavut. Particular attention has been paid to family history and life trajectory.

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Location/Region: Nunavut Wide
Project Title: **Developing Linkages to Increase Capacity for Inuit Women's Health**

Summary:

There is little published research about Inuit health, and even less about Inuit women's health. However, Inuit women face multiple challenges that impact their health including geographic environment, remote location, and social and cultural differences that may impact their health and well-being. We are a multidisciplinary team of researchers who have worked with diverse groups of women (such as immigrant women, women with disabilities, rural women and First Nations women) on a variety of women's health

projects. Through development of strong connections to the Nunavut community of Iqaluit, we will work with northern stakeholders who are interested in participating in women's health research in Nunavut and provide training on qualitative health research interview tehniques. We have been working with community organizations and health professionals in Nunavut for the development of this project and will continue to involve these groups for the duration of the project. In the short term we will develop linkages between university researchers and the Nunavut community, provide research skills to local research assistants, and an Iqaluit born graduate student, and gain information from which other health research proposals can be developed. We will also provide education on bone health to community members through a number of meetings and in-service opportunities. In the long term, this project has the potential to begin the work of raising awareness of northern and Inuit women's health issues. It will provide information that is community-based, culturally sensitive and responsive to locally identified women's health needs that can be used by decision makers and program planners.

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Project Title: **Inuit Women's Attitude Towards Teenage Pregnancy**

Summary:

The continued prevalence of teenage pregnancy in the north is of concern to many health and social care providers. Sociologists have found that teenage childbearing, although traditionally accepted in many parts of the world, often becomes a 'problem' in culturally and economically Westernized countries. If health care providers view early childbearing as a social problem, how is this issue viewed by the general Inuit population? The purpose of the proposed research is to measure the attitudes of Inuit women towards teenage pregnancy and related issues. The results of the study will provide some idea of differences in attitudes between different ages of women, and thus indicate any trends in the attitudes towards this issue. The data may also be examined for connections between attitudes and changing rates of teenage pregnancy, including prediction for future rates.

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Project Title: **Management of Chronic Suppurative Otitis Media in the Inuit Population - Topical Ciprofloxacin vs Acetic Acid**

Summary:

Chronic suppurative otitis media (CSOM) is a very common problem in the Inuit population. It is by far the most common problem prompting referral to otolaryngology - head and neck surgery. Management of this condition consists of ear toilet and application of topical antiseptics or antibiotics. Application of topical dilute acetic acid is currently the most common topical treatment employed. It is simple and inexpensive, but is often painful, and the effectiveness of this treatment is modest at best, with many patients recognizing little if any benefit. As a result there is an ongoing search for more effective topical agents. Topical ciprofloxacin is a promising new agent that may prove to be a more effective treatment for this condition. It is the first topical antibiotic to be approved for use in the middle ear. It has excellent efficacy against the common pathogens associated with CSOM and is much less irritating to the middle ear. However, it's clinical efficacy in the management of CSOM has not been proven and it is vastly more expensive than acetic acid treatment. Therefore, we propose a blinded randomized prospective trial to address this issue.

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Location/Region: North Baffin
Project Title: **Flashline Mars Arctic Research Station**

Summary:

The Mars Society is a private international society dedicated to furthering the human exploration and settlement of the planet Mars. In July 2000, the Mars Society established a research facility at the Mars-like Haughton impact crater site on Devon Island, Nunavut, called the Flashline Mars Arctic Research Station (FMARS). Designed to simulate a landed space craft on Mars, the FMARS project serves three goals: 1) To

provide a testbed 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, Mars, and the possibilities and limits of life on our planet and beyond. 3) To inform and inspire people around the world to take a greater interest in space and science by bringing before them in a tangible form the vision of human exploration of Mars.

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Location/Region: North Baffin
Project Title: **Fish from High Arctic Lakes: Cumulative effects of contaminants and climate warming**

Summary:

The purpose of this project, which began in 1999, is to investigate changes in amounts of contaminants over time in landlocked arctic char from lakes in the Canadian high arctic islands. We are measuring the amounts of contaminants such as mercury and PCB's in the fish each year to see if they are decreasing or increasing. We are studying Resolute, Amituk and Char Lakes near the Hamlet of Resolute Bay because char from those lakes were first sampled for contaminants in 1993 and, therefore, the older results can be compared with newly collected samples to see if contaminant levels are increasing or decreasing. We have found that the amounts of mercury are going up slowly in char from Char Lake and Amituk Lake but have gone down slightly in Resolute Lake. In 2005 we also propose to collect fish from other lakes in the area such as North Lake, and lakes on Devon Island and Somerset Island, to compare contaminants in char with results for the fish in Char, Resolute and Amituk Lakes. All fishing will be done between July 3 and Aug 31, 2005. We will take 20 fish or less from Resolute Lake and 10 fish or less from Char Lake. We will hire a person from Resolute to help us with the fishing. We will also collect sediment, water, and insects from each lake to study the amount of mercury and other contaminants that char may accumulate from their diet or from water. We will continue to report our results annually to the Hamlet of Resolute Bay.

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Project Title: **Chemical communication of polar bears (Ursus Maritimus) via foot prints during mating season**

Summary:

Objectives of this project are to collect snow samples of polar bear tracks during mating season on Frobisher Bay and the Allen Island area to determine the presence of chemical compounds (for example, pheromones, or attractants). Travel will occur on snow machines (3-5 individuals, including the ETP students). Tents will be brought as to allow to overnight when necessary, or for emergency shelters. Usually, weekend trips or a 2 - week trip is planned between February and May 2005. When traveling, we will focus on floe-edge activities and fiords to detect polar bear tracks, or we will scan the area with a spotting scope for polar bears. Once bears are detected, we will approach within a few kilometres to determine sex, and will cue in on their foot prints to collect snow samples. Samples of snow will be collected with spoons into freezer bags. Bags will be kept frozen at -20 degrees celcius until shipment for laboratory analyses in Oregon, United States. During this project, no permanent structures will be erected. This project in its execution is not any different from a group of 3-5 individuals traveling by skidoo to go hunting on the ice. The collection of snow has been selected because it is non-invasive, and has no impact on the polar bears, however, the information that can be collected is immensely valuable. Travel by skidoo is a less-intrusive method as compared to helicopter. Depending on how many samples we can collect and analyse, it is anticipated that more samples will be collected during 2006. An anticipated sample size of 10 track snow samples of males and females will collected.

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Location/Region: Kivalliq
Project Title: **Dendrochronological Field Investigations at the Northern North American Treeline**

Summary:

The goal of our project is to develop tree-ring records from old growth trees at northern treeline locations in Canada and Alaska for paleoclimatic studies. Over the past two to three decades, scientists from our laboratory have conducted field work from such locations, including the Compermine River area (which we first sampled in 1978, Mackenzie Mountains (first sampled in 1984) and the Thelon River area (which we sampled in 1984). We resampled the Coppermine and Mackenzie sites in 2004. As a result of these efforts we have compiled a database of tree-ring data for the circumpolar Arctic which have and are being used to reconstruct Arctic and Northern Hemispheric temperatures over the past several centuries to millennium.

Our current project aims to collect both living and subfossil wood material, primarily of white spruce and larch, from the Thelon River area of Nunavut in the summer of 2005 in order to update and extend our previous collections. It is planned that three persons from our laboratory will conduct the field trip (estimated to last approximately 4-6 weeks, using commercial and chartered aircraft (helicopter, float plane) where appropriate. Temporary camps (tents) will be used, and infaltable rafts may be employed. Research methods will include the nondestructive sampling of living trees (primarily white spruce) using increment borers. Chain and hand saws will be used to obtain sections from dead wood material. The resulting extended records will allow us to infer information about the nature of past climate during the "Medieval Warm Period" and the "Little Ice Age" relative to the past century of large-scale warming and anthropogenic increase in trace gases. This work is fully funded by the USA National Science Foundation. The Principal Investigators of this project are Rosanne D'Arrigo, Gordon Jacoby and Brendan Buckley. Results will be reported to the appropraite agency.

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Location/Region: Sanikiluaq, Keewatin
Project Title: **Community Based Monitoring on Sea Ice Climate Variability and Change**

Summary:

We would like to propose a Hudson Bay pilot community-based monitoring program to be hosted by Sanikiluaq. This program will focus on sea ice and climate to identify what changes may be occurring and to better understand why these changes occur. Specific objectives of the program are as follows: (1) to develop long term monitoring of physical climatic variables over sea ice within the Canadian Arctic; (2) to promote interaction between youth and monitors within a community using the focus of climate variability and change and (3) to promote interaction of youth between Arctic communities through a focus on climate variability and change. The major infrastructure of this porgram will be an automated weather station to be installed on the sea ice near Sanikiluaq that will collect meteorological data, including: downwelling and upwelling long and shortwave energy, wind speed and direction, and temperatures of the air, snow, sea ice and ocean. This station will be at a defined monitoring site to be located between 10 to 30 km offshore. The automated station will download data via a line of site radio telemetry to a computer to be housed within the community. The monitoring site will be visited on a regular basis (2 weeks to 1 month interval) by 2 trained community-based monitors, hired through the Municipality of Sanikiluaq. During these site visits, the automated station will be checked for damage. The monitors will also record visual observations of the site, take a picture and collect distributed measurements of snow depth and ice thickness. These data will then be entered into the computer housed in the community. We are also developing an interactive educational website where all data collected as part of the community-based monitoring program will be displayed in near real time. The purpose of this website will be to entice young and old students on cryospheric (ice-system) sciences and in particular issues of climate change, while providing a forum to observe what is happening near their own community and across other Canadian Arctic communities. Through ArcticNet and additional funding sources, this program is planned to continue for many years. Furthermore, assuming a successful pilot program within Sanikiluaq, an annual expansion of this program to surrounding communities in Hudson Bay is planned.

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Location/Region: North Baffin
Project Title: **Evolution of a new geochemical proxy (indicator) for past sea-ice levels**

Summary:

The Arctic region presents some of the clearest evidence of global warming on Earth. This change in climate will have a direct impact on Arctic communitites. The purpose of this project is to determine whether lipids (fatty compounds) produced by microscopic algae living in the bottom layers of the sea ice would be a useful indicator of past climates. Only a small number of sea ice algae produce these lipids and a recent study has identified large amounts of these algae in sea ice collected from a land-fast ice station near Resolute. We plan to collect microscopic algae from the land-fast ice in the Resolute Passage (74 42.490N, 95 49.510W), near Griffith Island, from 12-24 May, 2005. Our team (3 scientists + 1 Inuit guide to be hired from Resolute Bay) will make day trips from the PCSP Resolute Arctic Station to the Resolute Passage site by snowmobiles with one sledge for our field gear. On site, four to six ice cores will be extracted with an ice corer and the bottom 5-6 cm of the ice cores will be cut and melted in isothermal containers in the dark. When melted, sub-samples will be used for the identification of the sea ice algae and the isolation of individual species. Isolation and culture of individual species will be performed as soon as possible at the PCSP Resolute Arctic Station. Back in our laboratories, we will be able to perform lipid analyses on the cultures of individual algal species isolated at the PCSP Resolute Arctic Station. This fieldwork should allow us to determine the production of these chemicals by sea ice algae and to understand changes in sea ice cover and extent over geological time.

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Location/Region: Kitikmeot
Project Title: **Baseline Environmental Studies - Anuri and Polar Claim Blocks**

Summary:

Initial environmental studies are being considered for the subject claim area. Studies envisaged will include collection of water quality samples up to three times during the summer period (June through September), measurement of stream flows, spot vegetation surveys of the claim area to verify aerial vegetation mapping, fisheries surveys in local lakes and wildlife aerial and ground surveys. Aerial surveys would be conducted by fixed wing or helicopter, flying at a minimum of 250 m off the ground to census caribou and muskox occurrence in the claim area. Aerial surveys would be conducted during spring and summer months (April through September). Ground surveys of passerines, raptors, upland game birds and shorebirds may also be undertaken. Fisheries surveys would be by non-destructive methods where possible.

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Location/Region: North Baffin, South Baffin
Project Title: **Marine benthic connections: Tracing trans-Arctic gene flow**

Summary:

All shallow water, coastal marine habitats in the North Atlantic have been directly affected by the last ice ago. While the effects of this great natural event have been extensively studied in the terrestrial flora and fauna, a similar effort for marine species throughout the North Atlantic with connections to the North Pacific has only recently gained momentum. By using genetic data and special modeling analysis methods, it is possible to reconstruct population expansions and sontractions, identify refugial areas, determine population connectivity over vast scales, and migrational directions of species.

One of our key goals is to determine the extent to which benthic marine organisms have recolonized temperate waters from southern refugia in the Atlantic vs. the extent to which recolonizations have occurred via southward cascades from the Pacific. Specifically, we hypothesize that exchanges between the Pacific and Atlantic are not "just something that happened in the past" but that gene flow is contemporary. In order to test this hypothesis we need extensive, population-level sampling of a number of target species from high arctic latitudes in the Nuanuvt region of Arctic Canada. This is an extremely remote area for which the expedition support is being requested. We have a team of specialists living in Canada with the experience necessary for completion of a project under the prevailing conditions in Nunavut. The inevitable effects of global warming on species distributions, shifts in community assemblages, and on their capacity for rapid adaption to new environments raise many questions for both sciences and society. Thus, the significance of the work is to link historical events with contemporary prcesses in marine species

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Project Title: **Ocean Currents in Cardigan Strait**

Summary:

In late August 2005, DFO's Institute of Ocean Siences in British Columbia plans to place two oceanographic moorings in Cardigan Strait. The work will be conducted from the CCGS des Groseilliers during its annual re-supply mission to Eureka. The two moorings will be deployed near the southern end of the Cardigan Strait at depths of 120 m and 180 m. They rise 3 m above the seabed and carry instruments to measure ocean current, temperature and salinity. The measurements will be stored within the instruments, which will be recovered with the moorings in 2007 or 2008. While the ship is in the area, we plan to lower a CTD probe on a wire to the seabed and back. The CTD probe will be used at the mooring locations and at locations across Fram Sound near Cape Turnbac. The purpose of the project is to determine how much seawater and ice flow from the Arctic through Cardigan Strait. The measurements are being made at the same time in Cardigan Strait, Kennedy Channel and Barrow Strait, which are the tree principal routes for water flow through the Canadian Arctic Archipelago. The study is a component of an international project called the Arctic Sub-Arctic Ocean Fluxes (ASOF). The goals of ASOF are new knowledge of the transports of water into, across and out of the Arctic, understanding of the impacts of these flows on Arctic climate and of how this impact may change as the Earth warms from human influence. Cardigan Strait is part of a large polynya that is kept free of ice for much of the winter by strong currents. The polynya supports a population of walrus over the winter and is a hunting area for the polar bear.

The knowledge of ocean currents and temperature obtained in this project will help us to understand why this polynya exists and how it may respond to climate change.

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Location/Region: North Baffin
Project Title: **Biocomplexity of Frost Boil Ecosystems**

Summary:

What we are hoping to do in 2005 is to set up a camp at Isachsen Ellef Ringnes Island for 10 days at the end of July - early August. The goal of the project is to look at, measure and sample the soils and vegetation that characterise this area. We are interested in interactions between the soils, the climate and the vegetation, and the way these interactions control the patterns of bare soil and vegetation that are found in the Arctic. Often these patterns form circular features called "frost boils". Our group will include vegetation scientists who will look at the plants growing in different areas; soil scientists who will describe and sample the soils; and permafrost scientists who will look at soil ice, and air and ground temperatures. We will analyse the soil, vegetation, climate and permafrost conditions at up to 3 sites in the vicinity of the Isachsen runway. At these sites we will mark and sample a 10x10m grid. We will erect an air and soil temperature monitoring station. We will collect small quantities of soil and plant samples. This summer will be the fourth year of a five-year research project. We spent last summer doing similar work at Mould Bay on Prince Patrick Island, and the previous year we worked on Banks Island. We would like to find moderately well-drained, fine-grained soils at Isachsen that we can compare to similar areas on Banks and Prince Patrick Islands. We want to see if some of the interesting relationships between the vegetation, the soils and the permafrost still hold true at Isachsen, an area with the coldest summer climate in the Arctic.

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Location/Region: North Baffin
Project Title: **Baseline Environmental Field Study for the Mary River Project Project Description**

Summary:

Baffinland Iron Mines Corporation is currently conducting an advanced exploration program at the Mary River Project, located approximately 160 kilometres south of Pond Inlet. Current exploration activities in the area commenced in 2004 and are on-going seasonally. Baseline environmental data collection will commence in the spring of 2005, and will continue until 2007, to provide good information to contribute to the development of an Environmental Impact Assessment for the project area. There will be three field visits this season between May and October. We expect to continue the baseline studies for three years until October 2007. Areas of study are the anticipated mine site location, Nuluujaak Mtn. and the potential transportation corridors (northeast to Milne Inlet (1 option) or southerly to Steensby Inlet (2 options)). Activities that will take place to conduct baseline monitoring are: -Set up a meteorlogical station for monitoring temperature, rainfall, wind direction and speed. -Establish water quality and flow sampling locations (ground water and surface water). -Fly two potential transportation corridors (the abandoned road from Nuluujaak Mtn to Milne Inlet) and a second potential route south to Steensby Inlet. -Sound monitoring. -Wildlife survey (observations only). -Bethnic and fish sampling. -Soil and sediment sampling. -Marine survey (observations only). -Archaeology (observations only)

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Location/Region: North Baffin
Project Title: **The changing glacial landscape of Colin Archer Peninsula, Devon Island**

Summary:

This work will investigate the dynamic and sensitive glacial environment of the Colin Archer Peninsula. This region has been identified as an area of exceptionally rapid glacial melt. The work asks whether this melt activity is characteristic of the region or if it is simply a result of climatic change. This involves measuring present and past sedimentation rates in several lakes in the area. Lake sediment coring will be carried out on five lakes in the area. This procedure involves drilling through the lake ice and placing a metal tube through the hole . The tube is then pushed into the lake bottom to capture a sample of sediment. A single core will be taken from each lake . Some small monitoring equipment will be installed in one of the lakes and a weather monitoring device will be established on or near one of the ice caps. This project will involve visiting the study site in years after 2004. This scope and scale of the project will remain the same.

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Location/Region: North Baffin
Project Title: **Calibration and Validation of the Cryosat Radar Altimeter: Field Studies on Devon Ice Cap, Nunavut**

Summary:

The two main objectives are 1) to differentiate seasonal elevation changes and long term changes in ice cap thickness and 2) to determine the relationship between surface elevation and changes in ice mass. Long term ice cap thickness will be calculated as the difference between stake movement and average accumulation rates . The rate of the transformation of ice to snow at each site will be estimates by measuring changes in the

length of the cable attached to the bottom of a 20 m borehole and to the ice surface. The change in the length between 2004 and 2006 will indicate the magnitude of elevation change that is caused by firn compaction and not related to changes in ice mass.

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Project Title: **Trace Contaminant Transformations in the Northern Terrestrial Ecosystems**

Summary:

Metal contaminants and other pollutants from anthropogenic and natural sources have been found in Arctic ecosystems. As of yet, little is known about how these contaminants move through the soil ecosystems present in the Arctic. This project is investigating how the unique biology and chemistry of the Arctic contribute to the unusual behavior of pollutants in the Far North. We are hoping to use this information to develop management strategies that could mitigate contaminant impact on northern Canada as well as provide new biotechnologies that may be useful for dealing with contaminants in other settings. The field component of this project will involve an extended stay of up to 8 weeks in the Truelove Lowland on Devon Island, Nunavut. This site was chosen based on previous studies indicating it's suitability for studying metal contaminant transformation, ecosystem diversity and the existence of a wealth of information including soil maps, vegetation analyses and landform classification. At least two students will be working in the field for the duration, with intermittent visits of supervisors Dr. Steven Siciliano and Dr. Derek Peak, as well as the possibility of other students doing research for their B.Sc and M.Sc theses. There is a base camp in the Truelove Lowland where personnel will be lodged although as of yet this has not been guaranteed. If this is not possible, personnel will sleep in tents and every precaution will be taken to have minimal impact on the site. Equipment and food will be transported by helicopter to and from the site. Much of the laboratory analysis will be done with portable equipment that will be used on-site. Samples of soil and water will also be taken back to Saskatoon for further experiments and analysis.

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Location/Region: Victoria Island, Kitikmeot
Project Title: **Holocene Paleoecology and Paleoclimatology of the central Arctic Islands**

Summary:

Our research is a study of the changes in the climate and vegetation across the Canadian Arctic for the past 10,000 years. We will determine how climate changes in the past affected the vegetation of the region. We will determine past changes in the climate and vegetation by studying lake sediments. Lakes are continually accumulating sediment, and therefore as you go deeper in the sediment, you are going back in time. We collect cores of the lake sediment and interpret how the vegetation has changed by analyzing the pollen in the sediment. This research program provides important information about the sensitivity of arctic vegetation to climate change. The objectives of the research program are: 1. Describe, the changes in the vegetation across the Arctic for the past 10,000 years. 2. Determine if the climate changes in the same way and at the same time across the entire Arctic. 3. Determine the extent of the present-day climate changes across the Arctic. A temporary camp of two people will be made, for a period of around 2 weeks. We will be left at the camp by helicopter. We have no motor vehicles, and carry our hand-operated equipment to the site. We collect a small (2.5cm diameter) core of the sediment from the bottom of the lake and return it to the laboratory. We plan to sample 2-3 lakes within walking distance of the camp. The pollen are extracted from the sediment and identified to document how the vegetation has changed through time. This year we are planning a small camp in southwestern Victoria Island, Nunavut (in the region between Quunnguq Lake and Mt Bumpus) and on in the Lidden Gulf region of Melville Island (NWT).

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Number in party: 2
Location/Region: North and South Baffin
Project Title: **Systematics and Evolution of Arctic Alkali Grasses (Puccinellia)**

Summary:

We are studying the morphology and genetic variation of arctic alkali grass (Puccinellia, also called "goose grass"). These grasses are important as food for geese and as colonizers of disturbed habitats. However, these plants are often difficult or impossible to identify and their origins are unknown. This research will investigate their range of variation and evolutionary origins. Our main goal is to make arctic plants easier to identify, important for conservation and environmental impact studies. Our study involves visiting four main sites that are known to have several different species of alkali grass. At each site we will make observations on the reproductive stage, morphology, habitat, and distribution of each species. Population samples of about 25 plants from 8 species in total (2-4 species per site) will be collected. We will not remove whole plants from the environment, but will take pieces from each plant whenever possible. A few leaves of each plant will be preserved alive for greenhouse experiments on effects of environment. Another part of each plant will be pressed and dried as a research voucher to be deposited at McGill University.

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Project Title: **Studies of Proterozoic dykes in Greenland and Nunavut, Canada**

Summary:

In 1915 Alfred Wegener proposed a major fault along Nares Strait between Greenland and Ellesmere Island to allow the northward separation of Greenland from Labrador. Ever since, the existence of this fault has been controversial: plate tectonic

reconstructions using marine magnetic anomalies in the Labrador Sea indicate a left-lateral offset of about 200 km, but Paleozoic sedimentary rocks appear to be continuous across the Nares Strait, limiting movement to less than 50 km. There is a major E-W trending dyke swarm (about 700 million years old) extending for more than 200 km in the Thule area of Greenland that appears not to continue to the west into Ellesmere Island. Instead, a possible continuation of the swarm, offset about 200 km, does appear in southern Ellesmere and Devon Islands. If the two swarms can be correlated it would support the conclusion that Greenland did undergo the net movement of about 200 km required by plate tectonic reconstructions. We use paleomagnetism, geochemistry and U-Pb geochronology to test the correlation of the two dyke swarms. Our results to date have been very encouraging and good data has been acquired. This is a continuing project, begun in the summer of 2002, that involves sampling the dykes, taking either small (fist-sized) blocks of the rock or 1-inch-diameter, 3-ince-long cores to conduct these tests in the laboratory at the University of Toronto. These sites are remote and accessible only by helicopter, and take, typically, about 3 hours to sample. We are dependent very much on the weather, as we orient the samples using a sun compass; if the weather is continuously good, we can finish our sampling in a week or two. Camping with tents may be required, or staying in the community of Grise Fiord as we have the last two years. If successful, this season may conclude the required sampling in Nunavut.

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Location/Region: Kitikmeot
Project Title: **Biophysical remote sensing of arctic tundra ecosystems along latitudinal gradient**

Summary:

Boreal and tundra environments account for a large proportion of Canada's land surface and are important systems within the context of global climate change research. These northern environments are thought to be particularly sensitive to changes in climate, yet it remains unclear as to how these environments will respond. It is expected that any alterations in arctic tundra ecosystem function associated with increased temperatures will be expressed through shifts in vegetation growth patterns, species composition and abundance. Remote sensing provides a means for monitoring these shifts using satellite images collected at frequent time intervals. However, this potential requires detailed field studies for validating appropriate remote sensing methods and scales of observation. Vegetation plots with dimensions of 100m X 100m will be located in what are determined to be uniform vegetation communities. To characterize the nature of each

vegetation community a number of sub-plots will be located within each plot. Percent cover for each vegetation class will be assessed and then averaged for the entire plot. Above-ground biomass samples will be weighed in the field and then dried and weighed at Queen's University. These field data will then be compared to satellite images to determine relationships between image values and the biophysical variables measured in the field. Vegetation indices derived from spectral data from satellites may provide accurate estimates of biophysical variables for arctic ecosystems. We aim to determine the sensitivity of remote sensing spectral indices for estimating above-ground biomass and percent vegetation cover for a range of arctic conditions across a latitudinal gradient. In 2005, we will have a small temporary camp (maximum of three people for six weeks) near Sanagak Lake, Boothia Peninsula, NU in order to carry out this field sampling.

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Location/Region: South Baffin
Project Title: **Evolutionary ecology and conservation biology of Atlantic cod from landlocked fiords on Baffin Island**

Summary:

This project concerns Atlantic cod populations in Ogao, Qasigialiminiq, and Tariuja lakes on Baffin Island. The goals will be to understand where these cod come from , how fast they grow, how old they are, what they eat, how many are in each lake and how much harvest they can support. The lakes will be studied to try to find other similar lakes that might also contain Atlantic cod. Adult and Juvinile Cod will be collected from each lake by gill net and/or angling. Tissue samples, ear bones, stomach contents, and various measurements will be taken. Some cod will be tagged and released alive to estimate the number of fish in each population. Lake depth, temperature and salinity will be measured. Plankton will b collected using a plankton net. An underwater camera will be used to observe cod to see what other fish and invertabrates live in the lakes. We have obtained some samples of ear-bones taken from previous studies and test-fisheries to minimize lethal sampling. An underwater camera system will be used instead of more damaging methods to see what other fish and invertabrates occupy the lakes.

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Location/Region: Kitikmeot
Project Title: **High Lake project**

Summary:

Wolfden Resoursec Inc. through it's consultant Gartner Lee Limited, will develop and complete the environmental, social and economic conditions for the High Lake project. And, to meet environmental assessment and regulatory requirements for developing the High Lake Project into an operating gold and base metal mine that will have about a 15 year mine life. Information gathering is expected to take several field seasons to complete, with most of the site information being collected in the summer. Socio-economic information and traditional knowledge gathering will occur throughout the year, and the planned community meetings. Wolfden's vision is to bring the High Lake property into mining production for the benefit of it's shareholders and the residents of Nunavut in a manner that respects the environmental and socio-economic conditions in Nunavut. Wolfden will operate in a highly professional manner to generate trust and respect between the firm and residents of Nunavut. The High Lake Project consists of the High Lake and Ulu mineral properties: transportation corridors from Ulu to High Lake and north to the coast and a deepwater port facility at Grays Bay on the Coronation Gulf. The High Lake project is located in the Kitikmeot region of Nunavut. Field work will include studies to gather environmental and socio-economic information that will help in design and construction planning. For all field studies, access will be by helicopter, boat or on foot as appropriate; ATV's will also be used near the existing camps, located at High Lake and Ulu. These camps will be used as the base camps for the field work. Sampling methods will include the collection of water, soil, rock, vegetation, and fish samples for analysis. Information will also be gathered about wildlife, birds, vegetation, fish, and weather conditions. Information on marine mammals, ice and weather conditions in the Coronation Gulf will be collected for proposedd shipping activities. Weather stations will be constructed at High Lake and Ulu to gather weather information. Archaeological studies of the area are also being done.

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Location/Region: North Baffin
Project Title: **Geology and Aeromagnetic research of project CASE 9-Pearya**

Summary:

The science task of the BGR-project "CASE 9-Pearya" is to study the structure and development of the northern margin of Ellesmere Island during the opening of the Arctic Ocean. The project combines onshore structural geology and onshore/offshore aeromagnetic survey for identifying and tracing the structures seawards onto the shelf. The observations are essential for interpretation of the architecture of Ellesmere continental shelf and the estimation of hydrocarbon potential along the northern margin of the Canadian Arctic. Our observations will also provide offshore aeromagnetic data which will be important concerning the Canadian Preparation for Determining the Outer Limit of the Juridicial Continental Shelf towards the Arctic Ocean (UNCLOS). Field work during CASE 9 divides into: (a) Helicopter-supported structural geology between Cranstone and Wooton peninsulas in northern Ellesmere Island. (b) Helicopter-borne aeromagnetic survey concentrating in the area between the west boundary of Quttinirpaaq National Park and Yelverton Inlet extending 40 km offshore Ellesmere Island. Work will be carried out from a base camp near the Twin Otter landing strip at Raconite River (west of M'Clintock Inlet). In addition, geologists will establish temporary fly camps. Transportation of fuel, equipment and expedition staff to Taconite River and back will be done by Twin Otter. No structures will be erected in the field except for the tents in the base camp and in fly camps. To reduce the environmental impact, we will split the project into two parts, so that the geology and aeromagnetic parties will not operate at the same time: The first (aeromagnetic) part of the expedition will operate from the 1st of July 2005 with approximately 10 members. The second (geologic) part will operate from the 26th of June to the 15th of August 2005 with approximately 13 participants.

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Location/Region: North Baffin
Project Title: **Measurements of Second-year and Multi-year Ice, Summer 2005**

Summary:

During the summers of 2000 to 2002, we measured the seasonal decrease in strength of first -year ice around Resolute. In 2003, using the Canadian Coast Guard ship Louis S. St-Laurent as a platform, we measured the properties of several multi-year ice floes and second-year ice around Cornwallis Island. Our measurements have been used by Canadian Ice Service, Transport Canada and by Industry. Using these measurements, we are gaining information about first-year, second-year and multi-year ice during one of the most important times of the year: summer, when shipping is most active. Last year we did not require a licence from NRI because we conducted field work on first-year ice off the Labrador coast. We wanted to compare the strength of Arctic ice to that of the more temperate, sub-Arctic ice. Our work in Labrador will continue next year. This year, we will again examine second -year and multi-year ice because it is of concern to both moving and stationary structures, such as ships and offshore platforms. Presently, we are able to give only an approximate area (the most-likely region) in which measurements will be conducted, since we do not yet know where the old ice will be most easily accessed, nor do we know the Coast Guard's plans. As a result, we are also submitting an application to the Aurora Research Institute. Since our work this year concerns resource exploration in Beaufort Sea, we hope that the Western Arctic will have the necessary amount of old ice. If old ice in the Beaufort Sea ice is not within our reach, we will shift our efforts to the central Arctic. Regardless of where the field program is conducted, it will consist of the same type of measurements as those made in past years (as discussed in the NRI application). The research will involve measuring the ice thickness with an auger, extracting several ice cores with a mechanical coring device and then measuring the ice strength with a borehole jack. Some of the ice cores will be transported to Ottawa for analysis whereas others will not be removed from the site (they will be placed back into the holes from which they came). No structures will be erected during the testing. The test sites will be left as we found them, minus several 10 cm diameter ice cores. The work will require a total of two weeks, between 1 July and 30 August 2005 and will use the Coast Guard Helicopter to access the ice from our base operations in the ship.

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Location/Region: Resolute Bay, Iqaluit
Project Title: **Investigations of Arctic microbial diversity associated with Arctic willow and introduced historic woods.**

Summary:

An understanding and appreciation for biodiversity in Arctic ecosystems is very important for future efforts to monitor and protect these fragile natural resources. Our previous investigations have found a rust fungus that attacks arctic willow. This fungus is bright yellow in color and can be seen on the leaves. It can kill the leaves and stems of the willow. The fungus is very different from other rust fungi and we would like to study this disease to determine it's impact and find out where the disease came from. This study will also look at decay processes in dead willow to learn what organisms are involved and how they contribute to woody biomass degradation in Arctic ecosystems. This will include studies on dead willow wood and also wood introduced into the arctic such as the historic woods brought by explorers to the region over 100 years ago. These historic woods are being degregaded by some of the same decay fungi as those found in degregading arctic willow. Knowledge of the biology and ecology of these fungi is essential to successfully preserve the historic sites for future generations. Results will not be of immediate use to managers of these historic structures but will provide new information on arctic biology and ecology and improve our understanding of how microbes function in the arctic. To study these organisms we would make collections of leaves and wood to study in the laboratory. We would also set up a study where sterile wood, cotton and other materials are placed into the ground and buried. These samples would be removed and taken to the laboratoy after 1 and 2 years to determine that microbes are in them. Transport will be by aircraft and camping will be at sites designated by Parks Canada officials. The study will take place 2004 to 2007.

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Location/Region: Rankin Inlet
Project Title: **Insect biodiversity and biography in the Canadian central barrens: eastern mainland Nunavut**

Summary:

In this project we hope to collect insects from the vicinity of Rankin Inlet, to study their biodiversity (what species are present) and biogeography (the reasons why they are present). Following the specialty areas of the participants, we will focus mainly on insects that live in and around water as well as those associated with flowering plants. Dr. Donna Giberson will study mayflies, stoneflies, and caddisflies in streams, and will determine what species are present, what their habitats are, and how available these important fish food items are to fish and other potential predators in the stream. Dr. Burian will also study mayflies, and his major goal is to determine if species not collected through previous sampling projects in the same area are "sampling zeros" (therefore due to collecting bias) or true "structural zeros". If these absences turn out to be structural, then he will have identified the true climatic limits of several species of mayflies. Dr. Savage will study true-flies associated with flowering plants, especially those closely related to house-flies. Her goal is to determine what species are present in order to update the species lists for the area and therefore better estimate the true biodiversity and northern geographical limits of these flies. Insects will be sampled using a variety of nets and traps: The Malaise Net catches flying insects that fly into it accidentally, and other flying insects are captured using a small net on a pole that can be swept through vegetation. Plastic yellow pantraps (size of a cereal bowl) will be placed on the ground and filled with salt water. These traps mainly attract flies visiting the surrounding vegetation. Aquatic insects are captured by disturbing rocks in a small patch of stream and catching the insects in a net just downstream. The insects will be returned to our universities for further study, and will be retained there permanently. We will fly into Rankin Inlet and use a rental truck or ATVs to reach target sampling localities. We will lodge in a cabin administered by Arctic College (sontact person Mike Shouldice) located about 10 km outside of the Rankin Inlet Community. The expected duration of our collecting trip is 2 weeks.

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Location/Region: Kivalliq, South Baffin
Project Title: **Parasites of Biting Flies in Nunavut**

Summary:

This is a continuing project on the distribution and biology of parasitic organisms in biting flies, especially mosquitos. I propose to visit Baker Lake, Coral Harbour, Iqaluit, and Pangnirtung to collect mosquito larvae from the local snow-melt pools. Approximately two visits are anticipated (2005-2006). Roundworm infections have been reported from these locations in 1954 (Coral Harbour and Iqaluit) and 1976 (Baker Lake). In previous surveys, I found roundworms in mosquitoes in Baker Lake (see research summary, 2003) and Iqaluit (research summary, 2004). Basically, I will collect mosquito larvae from the snow-melt pools with a plastic dipper and keep the mosquito larvae in small containers until the parasites kill the mosquito larvae or dissect the mosquito larvae to recover the parasites. The parasites will be either frozen or preserved in solvents for future studies on the morphology and molecular relationships of the parasites. These studies will be valuable for developing a better understanding of the distribution of these parasites in biting flies. In addition, I hope to develop a better understanding of natural control mechanisms in populations of biting flies.

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Location/Region: North Baffin
Project Title: **A deep ice core from the Prince of Wales Icefield, Ellesmere Island: High resolution reconstructions of climate, glacier mass balance, and sea ice conditions in the Baffin Bay region over the last 100 years**

Summary:

The research team wished to aquire two deep ice cores (ca. 350-m long) from the Summit region of the Prince of Wales Icefields, Ellesmere Island, NU, in spring 2005 and spring 2006. Reconnaisance work for the ice core site selection and ice core interpretation will be done in spring 2004. This study builds on three years of preperatory work (2001-2003) on the Prince of Wales Icefeild, in which, Marshall and Sharp established the meteorological and snow chemistry characteristics of the proposed ice core site. This is an unusually wet area for the high Arctic, with annual snowfalls of over 1m, offering the possibility for high-resolution reconstructions of climate, sea ice conditions, and atmospheric chemistry over the last 1000 years. Ice core acquisition from mid-April to mid-May in 2005 and 2006 will require a temporary camp at the Summit site of the Prince of Wales Icefeild. A group of four will spend 3-4 weeks acquiring the 350-m cores, which will be packed in coolers and shipped out to Resolute (and on to Ottawa). In addition to the long cores, a series of short cores will be collected and analyzed for signal-to-noise ratios in the ice core environmental proxies, annual layer thickness, snow-water and sulphate isotopes, and dissolved ion concentrations that can be used for annual layer identification. Fieldwork in spring 2004 is scheduled for April 24-June 4, and will involve University of Calgary M.Sc student Vivian Wasiuta, a field assistant, and R.M Koerner. This fieldwork will include the following (a) Ice-penetrating radar studies at the proposed drill site, to map the bedrock /ice thickness and guide the final ice core site selection (b) Data acquisition and maintenance of the automatic weather station at the Summit site, and (c) Snow sampling for sulphate isotopes (an open water/sea ice proxy) on transects from the ice divide to the eastern edge of the Icefield, on the Leffert and Alfred Newton Glaciers.

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Location/Region: South Baffin
Project Title: **Glacier-climate studies on Grinnell ice cap**

Summary:

This is a proposed extension of the monitoring program of glaciers we (Geological Survey of Canada) have been conducting in the high Arctic since the early 1960's. We want to establish a site on Grinnell ice cap to monitor the status of the ice cap for detecting and measuring climatic change in the southeastern Arctic. In 2004, we will evaluate if the ice cap is suitable for this work. If it is, we will set up snow depth poles to measure annual snow accumulation and loss during future visits, and we will install an automated weather station to collect year-round weather information. We will also collect some snow samples to measure levels of air pollutants deposited in snow. We are applying for a multi-year license (2003-2006) to include future follow-up work of the same nature.

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Location/Region: North Baffin
Project Title: **Validation of CryoSat Satellite - New Techniques for Glacier Mass Balance Observation**

Summary:

Glacier and ice cap changes are recognized as very good indicators of climate change. The GSC has collected and assessed mass balance data from numerous ice caps in Nunavut for over 40 years. This information had provided the basis for a number of important investigations concerning climate change. The data and assessments will be discussed in the Arctic Council's Arctic Climate Impact Assessment (ACIA). Traditional glacier and ice cap mass balance measurements conducted on the ground are very reliable, however, there is a need to improve our ability to measure and assess glacier changes over wider areas and regions where glaciers are found. To do this we are developing new techniques and evaluating existing aircraft and from space to extend over

large areas the manual (by-hand) observations made at single points on the ground. It is also important to determine with greater confidence why these glaciers are changing. The goals of this investigation, therefore, are to: 1. Develop new methods for measuring glacier mass balance on the ground, from aircraft and from space. 2. Validate a new satellite sensor (CryoSat) that will assist in mapping ice cap elevation and snow accumulation changes. 3. Determine if snow accumulation has been increasing on the ice caps due to climate warming. 4. Contribute to efforts that are determining where the ice caps of Nunavut are growing or shrinking. The work will be conducted out of a single main camp (4 people) with field parties traveling periodically along measurement lines from this camp to the ice cap edges. We will be testing our methods and conducting ground measurements on Agassiz Ice Cap in the spring of 2003 (6-8 weeks). Ground and aircraft measurements will be conducted on Devon Ice Cap in the Spring and Fall of 2004 and 2006. For 2003, we will consider Devon Ice Cap as a suitable alternate to Agassiz if weather prevents access to Agassiz. We will be living and working out of 2 portable man tents and 1 portable lab/communal tent. All can be assembled and disassembled quickly. No permanent structures will be left.

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Location/Region: North Baffin
Project Title: **Glacier Mass Balance and Pollution**

Summary:

The program is an ongoing one started in the early 1960s to monitor glacier health and climatic change in the Eastern Arctic. Beginning in early April, 2003, we will re-measure the mass balance of Agassiz (N Ellesmere), Meighen, Melville South, northwest Devon Ice Caps, and a small Glacier near Grise Fiord. There are automatic weather stations on each ice cap and these will be downloaded and re-set. Campbell Scientific will again send a technician to check and download the 3 Agassiz automatic weather stations. If convenient, we will also check out and download the AWS on Meighen Ice Cap. At the same time, snow samples will be collected from each ice cap as part of a continuing program to monitor any changes in the amounts of pollution coming into the high Arctic. Campbell Scientific will send an employee to download three stations on Agassiz Ice Cap, and Jocelyn Bourgeois (GSC) will collect samples for snow biology there.

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Location/Region: North Baffin
Project Title: **Reconstructing Weather from the sediments at Cape Bounty, Melville Island and North Lake, Cornwallis Island**

Summary:

Our work is intended to develop a long record of past weather and river conditions using lake sediments. Our work will involve obtaining sediment from the lakes and measuring processes that control sediment deposition at Cape Bounty. We have chosen these lakes because the rivers appear to supply abundant sediment and deep lakes are needed to preserve the sediments for our research. We will complete the work at North Lake in several days and then establish a small camp at Cape Bounty. We will collect samples from the lake through holes in the ice. We will study sediments in the laboratory and measure the amount of sediment that has accumulated each year in the past. We will also look for evidence of major rainfall events during the summer and late fall. To measure weather and sediment deposition in the lake during the summer, we will place instruments in the lake and on the river to tell us how the rivers respond to weather and how much sediment is transported. Additionally, we will collect vegetation samples and measure the amount of vegetation to compare with satellite images to determine if vegetation can be mapped this way. This work is also important for understanding where wildlife are found and how vegetation changes.

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Location/Region: North Baffin
Project Title: **A Holocene context for current Arctic warming derived from the vanishing plateau ice caps of north-central Baffin Island and lake sediments on coastal northeastern Baffin Island**

Summary:

The overall goal of our current research program is to investigate climate change over the recent past. We will do this in two ways. First, we will study the recent history of disappearing glaciers in the northern interior of Baffin Island. Second, we will study indicators of climate change archived in lake sediments near the hamlet of Clyde River. These projects will help us place current global warming into the context of the recent climate history of Nunavut. For these projects, we will need to collect rock and vegetation samples that are used to underlie the now-melting glaciers, and mud from the bottom of lakes. We will conduct most of our field studies via skidoo in the spring. We also hope to team up with a Geological Survey of Canada field station. If this happens, then we could use some of their supplies and transportation. No permanent structures or stations will be built, and this research has minimal impact on the landscape. In our work on Clyde foreland, we will stay in Clyde River and we will camp using tents while working in the northern interior. We have worked from Clyde River in recent years, and have involved many people from the community in our past research. This new project is an important step towards understanding how global warming will manifest itself in arctic environments like Nunavut.

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Location/Region: North Baffin
Project Title: **Sedimentology, diagenesis and paleoceanography of Permian carbonate rocks, Ellesmere**

Summary:

The carbonate strata of the Sverdrup Basin, Canadian Arctic, record extreme perturbations in marine circulation through time. Early Permian sediments accumulated in a succession of warm, tropical paleoenvironments that have many similarities to modern subequatorial ecosystems. Conditions changed abruptly about 280 Million Years ago, with carbonates formed by components that usually grow in temperate, cool-water marine settings. At the end of the permian deposition across the basin took place under cold-water conditions with many similarities to modern polar environments. The details of these profound changes, and the reasons for them, remain obscure. The focus of this planned research will be on the specifies of paleoceanography and the boundaries between sedimentary systems. This is to be accomplished via three integrated activities: 1. Paleoceanography of warm-to-cool-water marine rocks throughout the Sverdrup Basin Permian utilizing stable isotopes and trace elements in brachiopod skeletal calcite as proxies; 2. Detailed stratigraphy, sedimentology, and diagenesis of early Permian mixed cool-and warm-water limestones manifest as the Great Bear Cape Formation; 3. Geochemistry of carbonate rocks across the critical warm-to cold-water interface encompassed by the Raanes Formation. The project will require five different fly camps on West-Central Ellesmere Island and the visit of half a dozen outcrops in a 100 km radius around Eureka. At each locality, one or more stratigraphic sections will be measured (using a Jacob's staff) as described.

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Location/Region: North Baffin
Project Title: **Contaminants in snow from High Arctic icecaps**

Summary:

Contaminants have been measured in the liver and fat of Arctic species, including seals and polar bears. Amounts of some chemicals such as PCBs and DDT are declining because their use has now been banned. However, others such as fluorinated stain repellents, which are used on carpets and clothing, have been recently found to be increasing. It is not known how these chemicals are reaching the Arctic. By collecting snow samples from ice caps in the High Arctic, we hope to find out how much of these new chemicals are entering the environment of Nunavut, and where they may be coming from. All the work will be done on the ice caps. In spring 2005, 2 people will go to the Devon ice cap by Twin Otter plane (PCSP) from Resolute. A single camp (2 tents) will be established on the ice caps. Travel to the collection site will be via snowmobile with 1 sledge, returning to camp daily. Field work will take approximately 3 days. We plan to do our sample collection during the first half of May. We will maintain regular radio contact with Resolute. Results will be communicated to the communities of Resolute and Grise Fiord.

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Location/Region: Kivaliq
Project Title: **Vegetation, permafrost and climate change near Baker Lake, Nunavut**

Summary:

In the context of global change, we are measuring if the tendency towards a warmer climate is detectable at Baker Lake and how the vegetation and the permafrost are responding to year to year climate fluctuations. The timing of flowering events (such as

bud break and seed dispersal) for three vascular plant species: Dryas integrifolia (Mountain Aven) Saxifraga tricuspidata (Prickly Saxifrage) and Cassiope tetragona (Arctic Heather) has been monitored since 1992 near the community of Baker Lake, Nunavut. These activities contribute to the international research program ITEX (International tundra experiment) in which countries of the circumpolar region unite efforts to understand climate change impact on the vegetation of the Arctic. Similarly, permafrost monitoring (active layer depth and temperature profiles) was established in 1997 and contributes to the Circumpolar Active Layer Monitoring Network (CALM) and the Global Terrestrial Network for Permafrost (GTN-P). In the summer season of 2005, a graduate student plans to spend two months at Baker Lake pursuing the original monitoring (measurement of flowering events and flower counts). In addition, we would like to compare plant reproduction and growth among warmed plots and control plots. We propose to use standard ITEX small greenhouses with no roof (Open-Top Chambers, 1.5m diameter), 10 for each species (total 30). We will measure temperature inside and outside the chambers with micro-environment data-loggers and collect a few plant speciments and soil samples for detailed analyses. The chambers could be removed at the end of the season but would preferentially be left in the field to eveluate their impact over a few seasons. We would like to know if the community is interested in such long term experiments. We would also like to get input of community members about their interest in the study of other plant species (e.g. berry plants) that may be affected by global change and that could be included in the experiment in 2005. Finally, we would like to know how we could best communicate our results to the community in the future, either by a bilingual poster, by a public presentation or by other means.

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Location/Region: Kitikmeot
Project Title: **Doris North Project**

Summary:

Miramar Hope Bay Ltd. Plan to carry out additional baseline aquatic investigations during the 2004 field program. The program for 2004 is considered an extension of the work done in 2003 and the data information collected is required to fill in some information 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 program in 2004 will focus on Roberts Bay, Little Roberts Lake and Roberts Lake areas, loacated in the northern portion of the Hope Bay Belt with the closest community being Umingmaktok. Community visits to Bathurst Inlet and Umingmaktok during the summer of 2000 summarized what the program

anticipated in 2000 and what we might expect to do in 2004. As mentioned, the study program for 2004 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 char spawning locations and migration patterns in and out of Roberts Lake. Tissue samples will be collected from approximately 100 fish (sculpin and stickleback) 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.

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Location/Region: North Baffin
Project Title: **An Investigation of the Impacts of Global Change on Permafrost in High Arctic Polar Desert Ecosystems**

Summary:

This is an ongoing study of permafrost hydrology, microbiology, permafrost and climate.This project has two main objectives: first, to assess and detect landscape changes associated with warming permafrost and melting ground ice. And second, to assess the nature and role of micro-organisms inhabiting frozen ground and rock and to assess how climate change will effect their ecology. The following activities are proposed for the 2004 field season and will involve spring and summer field work. We will continue to search for other active and relic spring sites that may exist . We propose to a) examine the microbial communities found in association with springs b) test our glacial lake-sub glacial recharge hypothesis, c) develop models for the different spring systems and d) continue physical and chemical studies of brine icing formations. We will also continue our work on ice covered lakes and will undertake chemical surveys to determine the characteristic of their water and ice, the structures of their water columns , and identify major biological and chemical process. We will continue the high resolution GPS mapping of spring outlets, flow paths and structures.

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Location/Region: North Baffin
Project Title: **Physical and Biological Implications of Permafrost and Ground Water Dynamics in a High Arctic Polar Desert Ecosystem**

Summary:

This research licence application is for the continuation of our investigations of high Arctic perennial springs. Our research is entering into a new phase that focuses on the biological and physical connections of these spring systems and their interaction with the surrounding polar desert ecosystem. We plan to continue our research on the hydrologic, geomorphic, and geological processes however by also looking at their microbial ecology (microscopic communities) and the various products of biological activity (biogenic mineralization, gases, biofilms) we hope to characterise a potentially unique microvial ecosystem. The 2003 field season we will continue to document and refine our understanding about hydrological and biological processes of spring systems at Expedition Fiord as well as spring sites occurring at Whitsunday Bay, Strand Fiord and investigate new sites including Middle and Bundle Fiords and Northern Ellesmere island. We will continue to look for other active and relic spring sites. We propose to (a) examine the microbial communities found in association with the springs, including the composition and distribution of the microbiota along environmental gradients particularly with respect to changes in redox, PH, temperature, light and dissolved gases, (b) test our glacial lake-subglacial recharge hypothesis, (c) develop thermodynamic and flow models for the different spring systems, and (d) continue physical and chemical studies of brine icing formation. Two periods of field work are planned, (1) 2 weeks in April and (2) 4weeks in June/July. The main field work are planned as follows, (1) 2 weeks in April and Whitsunday Bay and Ward Hunt Island. Samples from springs, lakes, surface runoff and precipitation will be collected for geochemical analyses. To determine the origin of the spring water we will measure the total dissolved gases in the spring water and compare it with those water in local lakes and glacial meltwater. We will continue high resolution GPS mapping of spring outlets, flow paths and structures. These data will be used by N. Martineaux to test different hydrologic models for these springs. Andersen will characterize the abundance, distribution and composition of the active bacterial communities in the springs and the runoff areas. The effects of environmental gradients on the microbial community will be investigated. He will also focus on the processes controlling microbially induced biomineralization. Andersen will use these data to develop models of this permafrost spring system that can be extrapolated to Mars in order to aid in site selection and experiment development for future Mars missions.

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Location/Region: North Baffin
Project Title: **Mass Balance Measurements of White and Baby Glaciers, Axel Heiberg Island, NU**

Summary:

Our research objective is to continue monitoring the mass balance of White and Baby Glaciers. Present computer models suggest that the Arctic regions will get warmer first and will provide the first definitive proof of global warming. Monitoring these glaciers and improving our measurement techniques may provide first hand evidence of any such warming. Essentially the mass balance of a glacier is determined by measuring the amount of snow that falls and accumulates on the upper parts of the glacier. Depending on which is bigger, accumulation or melt, the glacier gains or loses mass. We need a very long record of annual measurements of accumulation and melt to be able to distinguish whether the glacier is reacting to normal weather variations or because the climate is changing.

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Project Title: **Mineralization at Three Bluffs**

Summary:

Previous bedrock geological and geophysical maps of the Committee Bay greenstone belt have been produced as well as geochemical and geochronological data, and resource assessments. However, although the general geological and metamorphic history is now reasonably well known, the complexity of this history leaves many detailed questions unanswered, in particular in relation to the timing of gold mineralization relative to the host rocks and various metamorphic events. This project is designed to address these questions by dating minerals from volcanic host rocks, metamorphic minerals, and ore minerals, using state-of-the-art geochronological techniques including Re-Os (sulfides), U-Pb (monazite, zircon), and 40Ar/ 39Ar (biotite, hornblende). This analytical work will

be supported by geological mapping and interpretation, to construct a model for ore formation in the Committee Bay greenstone belt. Benefits of this research will include: 1. Industry: Well constrained age relationships for host rocks and metamorphic events essential for effective mineral exploration, both at regional and deposit scales. By establishing these relationships, and tying them in to the paragenesis of gold mineralization, our company partners will be able to rationalize the complex geology of this region, and target their work more successfully. 2. Geological disciplines: New giological and metallogenic information about a little studied region of Nunavut, as well as an opportunity to test various geochronological techniques. 3. Institution and training: The University of Alberta has recently released its "Northern Strategy", in which it reaffirms its strategic commitment to northern research. This project coincides with these objectives. In addition, the central role of students training in this proposal is in accord with university and NSERC policies towards training of HQP. 4. Regional development: Mining offers one of the few development opportunities in Nunavut, and this project will contribute to mineral exploration and potential resource development in the region.

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Location/Region: North Baffin
Project Title: **Water quality, Bathurst Island, Climatic Change**

Summary:

We propose to survey present day water quality and to obtain long-term environmental data from lake sediment cores from sites on western Bathurst Island. We (M. Douglas, University of Toronto and J. Smol, Queen's University) have been working primarily in Nunavut since the early 1980's, studying lakes, ponds, and streams in the High Arctic. Our overall goals are to characterize the freshwater systems of these regions, and to try and determine if environments are changing in these sensitive areas. Of particular interest to residents of the region may be the large database of water quality variables that we are assembling for a large number of sites in the Arctic. We are also attempting to assess how this part of the Arctic may be changing due to climate change and other factors, and how these changes differ from elsewhere in the Arctic. In the 2005 season, we would like to focus our work on a short trip (approximately 14 days in July) to sample about 20 lakes and ponds within walking distance of Polar Bear Pass camp. We will remove a small sample of water (~2L) from each pond, as well as a small amount of mud (a few cm3) for analysis of indicators of environmental change. We do not sample or disturb any wildlife or fish. In addition, we hope to use the PCSP helicopter to undertake several (approximately 5) transects from our base camp to sample a wider diversity of

sites. We would like to sample some of the small surrounding islands, such as Vanier Island. At present, we cannot outline exactly which transects we could do, as this involves guidance and approval from several regulatory agencies, as well as logistical concerns. We will of course abide by all restrictions and local concerns for these flight paths. We understand concerns about wildlife, etc., and will alter our work accordingly.

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Location/Region: North Baffin
Project Title: **Mercury levels in arctic lakes**

Summary:

The objective of our research is to examine mercury accumulation in arctic lakes and coastal areas. Mercury, in its gas form, is effeciently transported around the globe, and even remote areas show evidence of mercury pollution originating from industrial sources. Mercury is a pollutant that accumulates in organisms and increases in concentation as it moves up the food chain. As a result, organisms that are higher up the food chain, such as predatory fish, can have mercury levels that may pose risk to humans as well as to wildlife. Our research will focus on investigating mercury levels in algae and invertegrates of freshwater and marine habitats. There is currently little information on mercury levels in these organisms, even though they are an important source of food, and potentially of mercury, to larger organisms including fish and marine mammals. Our goal is to investigate the spatial variability of mercury concentrations of marine shrimps, lake zooplankton, and lake benthic invertebrates (eg. fly larvae) collected from different sites between Cornwallis and Ellesmere island. In addition, algae will be collected from small freshwater streams. Samples of algae and invertebrates will be collected from two main areas: Corwallis Island and Ellesmere Island. Algae will be collected by scraping them off rocks and invertebrates will be collected using hand nets made of fine mesh. Researchers will stay at existing bases or camps (Resolute, Eureka, Lake Hazen) and therefore, no new camps will be erected. Sampling sites near Resolute (eg Small, Resolute, Char, and North lakes) will be accessed by all-terrain vehicule (ATV) along existing trails while remote sites will be accessed by helicopter. No significant perturbations are expected at either the lake or marine sites because only small amounts or invertebrates and algae will be collected from each site.

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Location/Region: North Baffin
Project Title: **Contaminant effects on nestling glaucous gulls in the arctic**

Summary:

The purpose of this study is to determine whether contaminants are affecting the health and fitness of glaucous gulls in the Canadian arctic. The glaucous gull has been selected as a representative sentinel species because of the elevated levels of many contaminants known to occur in this species, relative to other species of wildlife in the arctic. Over a three-year period, a maximum of 70 glaucous gull chicks, approximately 20-25 days old will be collected for contaminant analysis and assessment of health. The study will be conducted at two locations: 1) Devil's Island near Cape Vera in Cardigan Strait (2005-2006) and 2) near Karrak Lake in the Queen Maud Gulf Bird Sanctuary (2007). Karrak Lake is the site of an existing Canadian Wildlife Services (CWS) field camp. The Devil's Island site is about a 20 minute flight from the existing Cape Vera CWS camp. A temporary tent camp will be set up at Devil's Island for 3-4 weeks each summer. The work at Karrak Lake, which will be done between early July and early August, will benefit from the infrastructure and logistics already in existence there. Transport into the study sites will be by aircraft (3-4 flights per year at Devil's Island, 2 flights at Karrak Lake). Annual progress reports and a final report to one of the study's major funders, the Northern Ecosystem Initiative, will be one way in which the study results are disseminated. In addition, the project will provide an annual newsletter to communities located near the study sites. At the end of the study, the study leader will be available for community visits to discuss the study's results if people from the community wish to have such discussions.

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Location/Region: North Baffin
Project Title: **Impacts of Changing Sea Levels and Climate Change on the Coastal Zone of Canada**

Summary:

The objectives of the research is to map the physical characteristics of the Canadian Coastine and document its evolution and type and amount of change occurring at different shore types. To accomplish this, shoreline markers were established at key locations along the coastline of Canada in the 1970s and 1980 by the Geological Survey of Canada (GSC). More than 200 sites are located across the Arctic Islands from more open water areas in the east to the ice-congested waters in the north and west so that impacts of waves and sea ice on shoreline stability can be assessed. The sites along eastern and northern Bylot Island and eastern Baffin Island represent shores where sea level is rising, wave energy and sea ice impacts are high. A total of 37 shoreling monitoring sites were established in 1979 and 1986. They have not been resurveyed since then. The objective is to document the amount and types of shoreline change that has occurred since the mid 1980's and to see if rates of change have accelerated because of the decrease in sea ice cover. The surveys will also allow the upgrading of the geographical positioning of the benchmarks using DGPS to make them available for future northern researchers. Information collected at the sites is used in national assessments of the impact of Climate Change by the GSC and other groups such as C-CIARN North.

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Location/Region: South Baffin and Kivalliq
Project Title: **Genetic networks specifically expressed in arctic plants: role in legume adaption to arctic**

Summary:

I first will need to obtain live plants and seeds from arctic natural populations of Oxytropis borealis hudsonica, O. deflexa foliolosa, O. maydelliana maydelliana, O. podocarpa and O. nigrescens arctobia (Fabaceae). Field trips to Iqaluit and Coral Harbour (Nunavut) localities are planned for summer 2005, they involve camping near the two towns for approximately 10 days at each place. I will access these localities by commercial airplane. The field work will take place in July - August, since it is at that time the plants are flowering and fruiting. Botanical field trips are not heavy on equipment requirements. Apart from the camping gear (tent, sleeping bags, food), I will carry identification books, silica gel (a desiccant that preserve DNA), plastic bags, GPS, camera. Various measurements will be done on site, and a few fresh live plants and seeds will be brought back to the laboratory at the Plant Science department in MacDonald College (Montreal, Quebec). Arctic and temperate populations (from Quebec and Ontario) of Oxytropis species will be grown under controlled conditions at McGill University, their morphology, anatomy and the gene they express will be analysed and compared. The molecular and bioinformatic data gathered will be put in relation to knowledge already existing in the model plant species of the legume family Medicago truncatula and Lotus corniculata, and to the agronomic plants Medicago sativa (alfalfa) and Glycine max (soybean).

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Location/Region: Kivaliq
Project Title: **Arctic Feedbacks to Global Change: A Circumpolar Perspective**

Summary:

The pupose of this work is to better understand the response of the Arctic treeline and permafrost to past climatic changes and future global warming. Climate models suggest that global warming will be especially significant in Arctic regions. On the one hand, these temperature increases could have a significant impact on the environment and communities that depend on its renewable resources. On the other hand, changes in vegetation and permafrost due to global warming could have significant feedbacks to the climate system itself, possibly resulting in more warming. The aims of fieldwork are 1) to study the present-day vegetation distribution from the boreal forest to the tundra by checking satellite images on the ground and 2) to collect peat profiles from already exposed peatbanks to investigate the history of vegetation and permafrost in the region. Research objectives are twofold: 1) are the present-day surface conditions in this region correctly represented in climate models? 2) what was the environmental impact of past changes in climate?

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Project Title: **Royer Butterfly Project**

Summary:

Some studies of butterflies in the Arctic were begun at Churchill in 1988 and 1989 and have continued with fieldwork being done in the Yukon (1990, 1992, 1999) and in Kugluktuk (1992, 1993) and on the North Slope of Alaska (2001). This part of the study will check to see if several species of butterflies are present at Bathurst Inlet in the central Kitikmeot region. Butterflies have not been studied much in the central arctic, so

scientists do not really know exactly what is there. Specimens will be captured with a butterfly net and preserved so that they may be compared with specimens in museums to see if they are the same or to see how they are different. The specimens will be placed in insect collections in southern universities or museums, and a representative sample could be sent to the Prince of Whales Northern Heritage Centre or a museum in Nunavut should this be desired.

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Location/Region: North Baffin
Project Title: **Structure and Formation of Thrust-block Moraines, Skaare Fjord, Axel Heiberg Island**

Summary:

The goal of this project will be to investigate the internal structure and genesis of a major thrust block moraine complex on the west side of Skaare Fjord, Axel Heiberg Island. Thrust block moraines are believed to be formed by proglacial pushing and thrusting of unconsolidated sediment and are found quite widely in front of glaciers in the Canadian high Arctic. However, a number of questions remain concerning how their formation relates to the flow dynamics of the glaciers that create them, the characteristics of the deformed sediments, and the distribution of permafrost within these sediments. Answering these questions will allow us to better interpret the distribution of these features in terms of past environmental conditions.

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Project Title: **Landsliding, slow mass movements & climate change, Fosheim Peninsula, Ellesmere Island**

Summary:

On the Fosheim Peninsula, shallow landslides called detachment failures take place every few years, generally during periods of warm weather. Slow movement of the surface layer, called solifluction, occurs every year. Both processes are important to the arctic landscape and ecology, and will be affected by climate change. Previous results suggest an increase in the rate of movement at three study sites located on the Fosheim Peninsula. This can be confirmed only through long term data collection. Hose columns, used to measure solifluction, were put in place at sites in Hot Weather Creek, Big Slide Creek and Black Top Creek (79N 84W) in 1990. Interim measurements were made in 1996, while the final data will be collected in 2005. The resultant data-sets will span a period of 15 years, thereby providing a solid foundation for the analysis of long-term movement trends. The hose columns embedded within the unfrozen portion of the ground will be manually uncovered. The disturbed ground will then be back filled and hand packed in order to return the ground to its original state. The mapping measurement of any new detachment failures that have occurred since 2000 will be completely non-invasive, but will help to extend the record of the frequency and timing of rapid movement events.

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Location/Region: North Baffin
Project Title: **Hydrological Response of High Arctic Wetlands to Local and Regional Environmental Settings**

Summary:

Wetlands are important ecological niches in High Arctic environments providing habitats for fauna and migratory birds. However these sites are sensitive to change initiated by northern development or climatic variability. Insufficient information exists about Arctic wetlands and there is a real need to make an inventory of wetlands and relate their form and function to large scale patterns of snow, permafrost and climate. These types of information will improve our understanding of their ecology and determine their susceptibility to future environmental changes. The present project will examine the role of regional and local environmental conditions on the hydrology of High Arctic wetlands. The immediate objectives of this project are: 1) to identify wetlands using remote sensing and relate them to factors such as climate, frost, snow and ecology; 2) examine the impact of climate variability on snowmelt, ground thaw, flooding/drying on wetlands; 3) assess regional versus local water sources in sustaining wetlands; 4) employ a permafrost model to predict susceptibility of wetlands to terrain disturbance, climate variability and climate change. Presently, a great deal of environmental data (water, energy, vegetation) has been collected at a wetland site near Resolute Bay and this research will continue. In addition, several target wetlands will be selected from areas of the High Arctic which experience cool/wet/cloudy environments (Cresswell Bay, Somerset) versus warm/dry/sunny areas (East Wind Lake, Ellesmere). Satellite imagery will help us to map these wetlands in terms of their form, snowcover, vegetation and flooding or drying conditions. Fieldwork will confirm the accuracy of the satellite images. We will carry out snow surveys in early May, before snowmelt and we will re-visit sites in late summer to download meteorological information (air/surface temperature, precipitation), determine maximum ground thaw and note maximum and minimum water levels in a series of water wells.

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Project Title: **Dundee Precious Metals Inc. Back River Project**

Summary:

Dundee Precious Metals Inc. is conducting mineral exploration for the Back River Project, which includes the Goose Lake and George Lake deposits in Nunavut. This exploration area (65.55'N; 107.25'W) is located approximately 550 km north-east of Yellowknife and 400km south of Cambridge Bay. As part of the exploration, Dundee plans to collect baseline meteorological and hydrological data in the George and Goose lakes area, as well as collect water quality samples. One meteorological monitoring station will be setup at each of the two camps. Meteorological data will include: air temperature, winds, solar radiation, precipitation, and relative humidity. The results will be presented in an annual summary report. Hydrological stations will be set up at the outlets of Goose and George lakes. A snow coarse survey will also be conducted as part of the hydrology baseline data. Water quality sampling will be conducted in the Goose and George drainage areas.

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Project Title: **Hydrology of Extensive Low Gradient High Arctic Wetlands: An Examination of Sustainability**

Summary:

Project Objectives: 1) examine the hydrology and sustainability of isolated, linked, dying and desiccated wetland types (e.g. ponds, wet meadows) within extensive low-gradient wetlands located in two diverse regional climate settings 1)polar oasis (Eastwind Lake, Ellesmere Island); and polar desert (Creswell Bay, Somerset Island); 2) assess the role and importance of geomorphological settings (i.e. glacial moraine ground, bedrock, coastal zones (i.e. Creswell Bay), marine ice rich sediments (i.e. Eastwind Lake) in the

hydrologic functioning of these wetland types; 3) utilizing a water balance framework at the plot, catchment and landscape scale assess the mechanisms for water inputs/losses and storage of these wetland systems over space and time; and 4) employing hydrologic information and understanding garnered at Eastwind and Creswell, examine the hydrology of a low-gradient wetland at the regional scale (i.e. Polar Bear Pass, Bathurst Island) so its temporal and spatial response to water inputs (meltwater, rainfall) and losses (evaporation and drainage) can be determined. This will then permit an evaluation of the future sustainability of this critical ecological site in context of varying climatic conditions and perhaps future climatic changes.

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Project Title: **"North Baffin Project: Economic potential through drift prospecting and surficial materials mapping"**

Summary:

This project is designed to evaluate the economic potential of northeastern Baffin Island through an improved understanding of the glacial history in this extensively drift covered area. Project outputs will: 1) contribute to digital northern geoscience data resources; 2) incorporate remotely sensed data and contribute to new multithematic models (partnership with the GSC's Remote Predictive Mapping Project); 3) help to assess mineral potential within the study area and 4)through outreach activities, promote increased community participation in exploration activities and geoscience resource development.

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Location/Region: Kivalliq
Project Title: **Paleoclimate and postglacial evolution of the southwestern Foxe Basin region, based on paleolimnological and geomorphological studies**

Summary:

Project activities: This research project that will be carried out in the southeastern part of Southampton Island, Nunavut, has two main objectives: 1) to explore the responses of northern freshwater ecosystems and their watersheds to climate change and to place instrumental temperature records into a longer-term perspective; and 2) to understand the recent geological evolution and processes as well as sea-level change in the northern Hudson Bay / southwestern Foxe Basin region.

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Project Title: **Bioremediation of petroleum hydrocarbon contaminated soils in arctic and sub-arctic conditions**

Summary:

Spilled petroleum liquids persist in the ground for long periods of time and serve as a source of long-term environmental contamination. Several researchers have recently demonstrated through laboratory experiments that significant biodegration of petroleum hydrocarbons can be achieved by indigenous microorganisms in soils from northern sites, at cold temperatures ranging from just below 0 C to 10 C (typical summer temperatures at northern sites). Bioremediation is a popular and often cost-effective technology for remediation of petroleum-contaminated sites that involves the microbial degradation of hydrocarbon compounds. However, further research is needed to evaluate the bioremediation potential in field-scale treatment systems under realistic temperature cycles; and to identify factors that may limit rates and extents of bioremediation in field-

scale treatment systems at northern sites. The goal of the proposed research is to investigate these issues and then develop guidelines for efficient bioremediation of petroleum contaminated soils at northern sites. Soils obtained from a contaminated site in Resolution Island, Nunavut will be used in small- and intermediate (pilot) -scale bioremediation experiments that will be monitored intensely to improve the understanding of the physical, chemical and microbiological processes that influence the efficiency of bioremediation at cold temperatures. Approximately 10m3 of contaminated soil and an equal amount of clean soil will be shipped from Resolution Island by Qikiqtaaluk Environmental Inc. staff. Biotreatment experiments using the site soils will be conducted in a unique laboratory room where temperatures can be varied to simulate daily temperature variations of a summer season of a typical northern site. State-of-the art equipment for environmental microbiology research will be used to gain a better understanding of the characteristics of microbial populations present in contaminated sites in northern regions.

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Location/Region: North Baffin
Project Title: **CANDAC**

Summary:

It is anticipated that the beginning stages of global warming will become apparent in the polar regions earlier than at mid-latitudes. For this reason, a group of Canadian atmospheric scientists from across the spectrum of institutional research, has come together to form CANDAC, the Canadian Netwark for Detection of Atmospheric Change. This group led by Principal Investigator Professor James Drummond of the University of Toronto, includes many of the top atmospheric scientists in Canada from universities, private industry, and government agencies. In addition, CANDAC will also partner with foreign efforts such as the American Study of Environmental Arctic Change (SEARCH) program, as appropriate. CANDAC will begin operations in the summer of 2005 in the vicinity of the Meteorlogical Service of Canada's (MSC) Eureka weather station located on Ellesmere Island.

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Project Title: **Water Baseline Sampling Program**

Summary:

The proposed work includes conducting baseline water quality sampling in the Ferguson Lake area located in Nunavut Territory, Canada. The objectives of the baseline water sampling program will be to provide baseline water quality data from the area where exploration efforts are focused, as well as from specific locations downstream of potential future activity, in order to start a baseline data set on water quality exiting the property. The 2005 water baseline sampling program will characterize waterbodies that have never before been characterized, and obtain seasonal data during the 2005 open-water season. It is proposed to collect seasonal data for select stream locations in June, August and September of 2005 to characterize freshet, low flow and high flow respectively. Also, it is proposed to collect lake water quality data one time during the summer of 2005. Each sampling program takes approximately 3 days.

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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 Island again this year. Our work is to support the major cleanup being undertaken by the Qikiqtaaluk Corporation for Indian and Northern Affairs Canada. The majority of the work will involve sampling and analysis of soil, barrel contents and other miscellaneous items. Work will continue this year with the removal of the PCB-contaminated soils from the S1/S4 beach area and valley where we will test soils to ensure cleanup is complete and also map locations. The permanent barriers constructed in 2003 will be monitored, repaired, tested and modified as appropriate. Further work will be conducted with respect to hydrocarbon contamination including additional environmental

assessment, monitoring and operation of the experimental land farm and other remediation trials. Other work that will be undertaken includes testing the lake and drinking water, testing and monitoring the performance of the existing barriers in drainage pathways, testing background water and plant samples and air monitoring .

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Location/Region: North Baffin
Project Title: **High Resolution Studies of High Arctic Paleoclimate from Varved Lake**

Summary:

We plan to go to Murray Lake in Quttinirpaaq Park in late July or early August 2004. We will travel by helicopter to the lake and set up a small tent camp for 5-6 days. We do not plan any permanent structures. There will be 3-4 people. We will use a rubber boat on the lake, if ice conditions are favorable. If the ice cover is extensive, we will cancel the trip this year. We will tow behind the boat an instrument that sends out sound waves into the water. These bounce back from the bottom of the lake and indicate the depth of the lake and the thickness of the sediment at the bottom of the lake. We want to find out the best place to take a core of sediments from the lake in future years. We plan to take 4-5 small sediment sample cores from the bottom of the lake this year, and to suspend in the lake 2 sediment traps. These will be removed in the future years. The work will help us to understand how the climate in the Park has changed over time, and to investigate if the temperatures were higher when early hunters moved through the region several thousand years ago. In our previous research in Murray Lake, the sediments we recovered enabled us to look at temperatures over the last 1000 years; now we would like to extend this record back 4000 years or more if possible. The research will have no impact on the fish or environment of the lake.

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Location/Region: Kitikmeot
Project Title: **Boothia Mainland Project: Economic Potential Through New Bedrock Mapping and Surficial Geosciece Upgrading.**

Summary:

This project is designed to evaluate economic potential of the Boothia Mainland area immediately south of Taloyoak through framework bedrock geological mapping and upgrading of the superficial geoscience information. Archean volcanic and sedimentary rocks of the Prince Albert group exposed in the region are thought to have a high potential for Au, Ni, Zn, diamond group elements. Similarily, the potential for discovery of bedrock geology of the area is complex and poorly understood, development of the regional bedrock geoscience knowledge base is a prerequisite to efficient mineral exploration in the region. Presently, little is known about the distribution of economic minerals within the study area, and only rare mineral showings have been identified in supracrustal rocks of the regioin. A flurry of recent diamond exploration activity and the acquisition of extensive prospecting permits in the region indicates that the area also has the potential to host diamond-bearing kimberlites. The proposed regional bedrock mapping, along with a drift prospecting survey and accompanying serficial geoscience activities, have the capability to identify new sources of AU, ZN, and PGE's associated with supracrustal rocks, as well as kimberlite indicator-mineral trails. This information will be obtained through characterization of regional geology and collection of drift samples and determination of background metal values and evaluation of regional-scale ice dynamics. Therefore, geochemical and heavy mineral surveys undertaken as part of this project will add significantly to the general geoscience knowledge of this area. Project outputs will:1) contribute to digital northern geoscience data resources, 2) incorporate remotely sensed data and contribute to new multi-thematic models, 3) help to assess mineral potential increased community particiation in exploration activites and geoscience resource development.

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Project Title: **Parasites and Biting Flies in Nunavut**

Summary:

This is a continuing project on the distribution of biology of parasitic organisms in biting flies , especially mosquitos. I will collect mosquito larvae from the local melt pools. Roundworm infections have been reported in 1954 and 1976. During the summer of 2002, I found roundworm in mosquitoes in one pool and ciliated protozoan in mosquitoes from a second pool. The parasites I collect will be preserved for future studies on the morphology and molecular relationship of the parasites. These studies will be valuable for the understanding of the distribution of these parasites in biting flies. I also hope to develop a better understanding of natural control mechanisms in populations of biting flies.

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Project Title: **ArcticNet: Integrated Regional Impact Studies of the Canadian High Arctic and Hudson Bay**

Summary:

ArcticNet (www.arcticnet.ulaval.ca) is a Network of Centres of Excellence of Canada that brings together scientists and managers in the natural, human health and social sciences with their partners in Inuit organizations, northern communities, federal and provincial agencies and the private sector to study the impacts of climate change in the coastal Canadian Arctic. The marine science component of ArcticNet seeks to better understand the impacts of climate variability and change on the Canadian Arctic marine environment through integrated regional impact studies. From mid-August to late October 2005, ArcticNet researchers will be sampling the waters of nothern Baffin Bay, the Northwest Passage, Amundsen Gulf and Hudson Bay onboard the Canadian Research Icebreaker CCGS Amundsen. Our sampling will be composed of short-term shipboard sampling and long-term deployment of marine observatories (moorings).

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Location/Region: North Baffin
Project Title: **Climate Change and Tundra Ecosystems:Species-Level Responses and Consequences for Ecosystem Processes and Feebacks**

Summary:

This project began in 1998 and builds on a long-term study 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 2-3 degrees Celsius by placing small (1.5 m diameter), open top greenhouses over them. In some of the plots, snow is removed so plants start to grow earlier, and in others snow is added so they will start to grow later. In other plots, I add a little fertilizer to stimulate plant growth. All of these experiments are meant to cause changes that may happen in the future as the climate gets warmer. We found that warming has changed the amounts of nutrients available to plants, and there are more nutrients available in the warmed soils of some sites, especially the wetter sites. There was not a large effect of the warming on the rate of nitrogen fixation in the soils, which is an important process that supplies new nitrogen to ecosystems. The numbers and kinds of plants (part of biodiversity) in the plots have changed in the warmed plots. We do not fully know what these changes in numbers and types of plants will affect animals feeding on them. One of the most important ways we can determine the effects is to measure the changes in plots like these over many years, which is what we continue to do. This coming summer we will also establish experiments to change the biodiversity in small plots by removing some species and adding seed from others. We will then measure how the plants and soils respond over the next few years. These experiments will help us to understand what happened to the tundra when the species diversity changes. My research site at Alexandra Fiord is part of the International Tundra Experiment (ITEX), which is a network of arctic sites and scientists around the world doing similar studies. My site is the oldest and most comprehensive ITEX site, 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, with permission, as our research camp.

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Location/Region: Kitikmeot, South Baffin
Project Title: **Mapping and Modelling Carbon Flux in Northern Canada Related to Land Use Change**

Summary:

A team from the Canada Centre for Remote Sensing (CCRS) familiar with the Northern environment will be performing field surveys to gain knowledge about the impact of human disturbance in northern Canada on vegetation. The data will be used in carbon studies through the collection of vegetation data, and for ground truth in remote sensing and carbon modeling activities. Very little research on carbon flux has been completed in Canada's north. Scientists from CCRS are attempting to lead the way for future carbon studies by modeling carbon processes thoughout the north.

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Project Title: **Mercury in Arctic charr from Kasegalik Lake, Belcher Islands, Nunavut, Canada.**

Summary:

The proposed project involves sampling of Arctic charr from Kasegalik Lake on Flaherty Island, Belcher Islands, Nunavut for the purpose of mercury analysis. Kasegalik is the largest freshwater lake on the Islands and is often used by Sanikiluaq residents to fish for ikalu. This proposed work is to further current baseline monitoring of backround mercury concentrations in Kasegalik Lake charr. Charr will be recovered using gill nets set in the Lake. Approximately 100 charr will be netted and transported (Honda) back to Sanikiluaq. The anterior (head) portion will be removed previous to the anterior dorsal fin and this section of head and muscle will be labeled, wrapped and frozen for transport. That portion not used shall be offered to any interested community members. Mercury analysis will be performed at the University of Minnesota Mercury Analysis Laboratory. Additional sampling may include fish from Hudson Bay waters offshore of the

community. Insects from the lake will also be sampled for food pyramid studies. Sampling of charr is critical when documenting environmental contaminant issues and the charr ecology complex on the Belchers. Atmospheric circulation is the main source for mercury deposition to the Arctic and it is important to continue monitoring the mercury reaching the Islands.

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Location/Region: Kivalliq
Project Title: **Identification and Characterisation of Ice Stream Sticky Spots: An Improved Understanding of Ice Stream Basal Mechanics and Shutdown.**

Summary:

One of the most important issues facing the world's population is the potential impact of future climate change and, in particular, the threat of increased global temperatures (global warming). A potential impact of global warming may be that ice sheets (such as the West Antarctic Ice Sheet) will melt, raising global sea level and having far reaching socio-economic implications, such as the widespread displacement of coastal populations. It is now known that the stability of the ice sheets is controlled by very rapidly flowing zones of ice known as the "ice streams". Ice streams are generally 30km wide and reach lengths of up to 400km. Their rapid flow and large size drain a disproportionate amount of ice from an ice sheet. Recently, it has been discovered that ice streams can change their size, speed up, slow down, and even shut down altogether. This behavior is puzzling but is almost certainly related to the conditions at the base of the ice where a layer of soft slippery sediment usually exists to lubricate their rapid flow. A problem with research on contemporary ice sheets is that it is impossible to observe and collect data from the sediments beneath the ice streams. Our own research has shown that during the last ice age (when an ice sheet covered most of Canada), a large ice stream flowed across the north-western Canadian Shield. It left behind an almost perfect record of it's flow by eroding and depositing the sediments in the area. The ice stream imprint initiated in the vicinity of Baker Lake and flowed north-westward through the Thelon Basin and up towards Bathurst Inlet. Now that the ice has disappeared we can access the bed of the ice stream and investigate the sediments that would have lubricated it's flow. We aim to observe and examine sediments in the vicinity of the Thelon River and carry out some simple tests in the laboratory to explore the processes influencing ice stream flow. In late July/ early August 2004 we aim to visit three sites in a two week period, all accessible by powered boat from Baker Lake, Nunavut Territory. At each site, we will set up camp for 2-3 days. Apart from the collection of very small sediment samples, our fieldwork will be purely observational.

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Number in party: 5
Location/Region: Davis Strait
Project Title: **Northern Shrimp Research Foundation, Shrimp Survey for NAFO 2G and 0B**

Summary:

Tavel Limited (TAVEL) has been contracted by the Northern Shrimp Research Foundation (NSRF) to manage a five year shrimp scientific survey (2005-2009) in NAFO regions 2G and 0B. This science initiative will be completed in collaboration with Fisheries and Oceans (DFO) to collect and analyze scientific data regarding the northern shrimp fishery. This science survey will be completed over a 45 day period each year, generally being executed from late July through August. The 45 days will be generally split between each area of 2G and 0B. All work conducted will be done aboard Fishery Products Internationals vessel 'Cape Ballard'. All crew and supplies will be provided previous to vessel departure, and there is no intent to land at any location in Nunavut and will not involve any Nunavut residents.

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Location/Region: North Baffin, South Baffin, Kivalliq
Project Title: **Regional differences and trends of contaminants in sea-run char from the Canadian Arctic**

Summary:

We want to find out what are the contaminant levels in sea-run char in the Canadian Arctic. We also want to find out if these levels are different in different regions of the Arctic. Finally, we want to find out if contaminant levels have changed since these contaminants were last measured in char.

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Location/Region: Kitikmeot
Project Title: **Ice Streams in the Northern Laurentide Ice Sheet**

Summary:

The Laurentide Ice Sheet was the last of a series of continental-sized ice masses which covered a large part of North America during the last glacial cycle. There is ubiquitous evidence of the existence of these ice sheets, especially in Nunavut, where a wide variety of landforms is observed. The most conspicuous of these are large drumlins (tall ridges elongated in the direction of ice flow) occurring in corridors up to hundreds of kilometers long. These landforms are thought to have been formed by ancient ice streams, ie the Laurentide analogues of the bands of fast flowing ice observed in today's Antarctic Ice Sheet. Ice streams play an important dynamical role because they evacuate most of the ice out of ice sheets. The study of ancient ice streams is important because there is evidence that the Laurentide Ice Sheet was also largely drained by ice streams. In Nunavut are found some of the best examples of ancient ice stream beds of the world. The landforms in these landscapes are much bigger than those produced by normal glacier flow and are hardly identified on the ground. Instead, satellite imates and aerial photographs are used to map old ice stream corridors which we have previously identified in satellite imagery. We plan to use Cambridge Bay as the base because of the easy access to aircraft. The aerial reconnaissance will allow selection of sites for future ground-based research. Our work is academic and focuses on a better understanding of ice streams and ice sheets. Notwithstanding, the coming results can be applied to improve models of mineral dispersal in glacial landscapes affected by ancient ice streams. Since Nunavut is rich in those types of landscape, our research can contribute significantly to the progress of the region.

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Location/Region: Iqaluit
Project Title: **Landfarming in Nunavut: Potential through optimization**

Summary:

NES (ENVIRONMENTAL SERVICES INC) owns, operates and maintains a landfarm in Iqaluit. The biomediation treatment of hydrocarbon impacted soils is an on-going and continuous process. Several thousand cubic meters of fuel-impacted soils are presently being treated at the landfarm. In conjunction with screening, aerating and fertilizing operations, the management of the landfarm obtains permits from the Nunavut Water Board, develops and implements a groundwater monitoring program, which chemically and biologically analyzes and tracks the performance of the landfarm. 60% of the landfarm's content originates from the new hospital foundations (2003). 25% of this volume will have been bioremediated to satisfactory levels by the end of 2005. The objective of this graduate resaerch study is to determine the feasibility of landfarming as a bioremediation method and treatment option for a chronically diesel-oil polluted soil. References can be obtained from Mr. Carl McLean, INAC, Iqaluit.

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Location/Region: Kivalliq, South Baffin
Project Title: **Hudson Bay Seals and Climate Change**

Summary:

The Hudson Bay marine environment is already showing affects of climate warming with less stable sea ice as one consequence. Seals using ice to breed (like ringed seals and bearded seals) should be negatively affected by the warming whereas it should be favourable for seals using land to breed (like harbour seals). Seal biology in the Kivalliq region is not well documented. Comparison of their life-history traits and movements could help to predict population consequences of climate change in Hudson Bay.

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Number in party: 9
Location/Region: South Baffin
Project Title: **Scientific Investigations supporting the Resolution Island cleanup project**

Summary:

The Analytical Services Unit, Queen's University will have a team on site at Resolution Island 2005-2008. Our work is to support the major cleanup being undertaken by the Qikiqtaaluk Corporation for Indian and Northern Affairs Canada. The majority of the work will involve sampling and analysis of soil, barrel contents and other miscellaneous items. Work will continue this year with the removal of PCB-contaminated soils from the S1/S4 beach area and valley where we will test soils to ensure cleanup is complete and also map the locations. The permanent barriers, which were modified in 2004, will be monitored, repaired, tested and if necessary modified. An additional barrier will be built in the S1/S4 beach area once the excavation of PCB -contaminated soils is complete. Further work will be conducted with respect to hydrocarbon contamination remediation. The experimental landfarm established in 2003 and the large landfarm established in 2004 will be monitored and maintained. Other work we will be undertaking includes testing the lake and drinking water, testing backgound water and plant samples and air monitoring.

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Location/Region: North Baffin
Project Title: **Haughton-Mars Project**

Summary:

The Haughton-Mars Project (HMP) is an international field research project centered on the scientific study of the Haughton meteorite impact crater and surrounding terrain on Devon Island, Nunavut, viewed as a site similar in many ways to Mars. The HMP is

managed and operated by the Mars Institute and is currently supported by the Canadian Space Agency and by NASA. (Reminder: The HMP is separate from the more recent activity at the same site involving the Mars Society.)

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Location/Region: North Baffin
Project Title: **Microbiology of Northern Sites: impacts of petroleum hydrocarbon contamination and remediation**

Summary:

The objective of this project is to monitor the effectiveness of a bioremediation system in decontaminating a petroleum hydrocarbon spill in an Arctic environment, adjacent to the Eureka High Arctic Weather Station. The biotreatment system included the addition of nutrients and tilling of the polluted soil to stimulate the indigenous hydrocarbon degrading bacterial community. Soil samples taken will be analyzed in the lab to determine the rate of petroleum hydrocarbon removal, the activity of the indigenous bacterial community and the presence of specific genes important in the degradation of petroleum hydrocarbons. The project is straight forward in that no structures will be erected, only one set of samples is required which will only take one day to procure and consist of digging holes in the contaminated area. These samples will provide valuable information regarding the conditions necessary for effective clean up of petroleum hydrocarbon polluted sites in the Canadian Arctic.

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Location/Region: Kitikmeot
Project Title: **CAM-D (Simpson Lake) Remediation Project**

Summary:

The federal government has initiated the Federal Contaminated Sites Accelerated Action Plan (FCSAAP) to clean up federally owned contaminated sites and to address the

environmental liabilities associated with each site. The FCSAAP program provides funding for the remediation of contaminated sites posing risks to human health and/or the environment. The Department of Indian Affairs and Northern Development (DIAND) has applied for, and secured, funds under this program for the investigation and remediation of the abandoned intermediate Distant Early Warning (DEW) Line site at CAM-D (Simpson Lake) 80 km west of Kugaaruk, and 120 southeast of Taloyoak in Nunavut.

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Location/Region: North Baffin
Project Title: **Microbial investigations of perennial springs, permafrost and ground ice in the high Arctic**

Summary:

Relitively few reports are found describing the ecology and biodiversity of microbial communities in the Canadian high Arctic where unique habitats exist including cold perennial salt springs, glacial ice and sub glacial soil, permafrost and ground ice, and cryptoedoliths (microbial communities within rocks). Little is knows about the traits that enable such microorganisms to survive and thrive in these extreme habitats. Therefor, I am presently developing and expanding a research program focused on Arctic mocrobial biodiversity and ecology studies in these habitats to expand our basic knowledge of Arctic microbial communities, to determine the utility of these unique environments as analogs to those which may exist or existed on Mars, and, in the longer term, the potential biotechnological applications of cold adapted microorganisms (examples: antifreeze protiens, polyunsaturated fatty acids.) In 2003, small representative samples (~2 kg of soil/ permafrost or 2-4 L of water) of the mocrobial populations will be obtained from the Eureka and Axel heiberg sites. Microbial biodiverstiy research will be conducted in my lab at McGill University on the collected samples. This data will provide information on the microbial populations associated with these sites, the physiological types that are involved in biogeochemical processes and hopefully establish which organisms become fossilized or preserved in the system.

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Location/Region: North Baffin
Project Title: **Arctic Ocean Climate Change Project**

Summary:

An oceanographic study in the eastern end of Barrow Strait has provided continuous measurements of water current, temperature and salinity from August 1998 to present, under research licence 0204802N-M. The objective of the work is to develop an understanding of the the circulation in the area, and to quantify the heat and fresh water movement between the Arctic Ocean and the Northwest Atlantic so that the coupling between these two oceans is better understood. Measurements, combined with modeling studies, are being used to determine how this coupling affects the local, regional and global climate systems. The data collected also provides a baseline for furthur studies. A continuation of this program has been funded to provide an extended continuous time series of data that can be examined for trends that may be linked to climate change. Quantified change in the fresh water outflow through Barrow Strait would be a useful global warming indicator. The principal method of data collection is 10 moorings that support current meters for measuring the speed and direction of the water flow, and "CTDs" for measuring salinity and temperature. The tops of all of the moorings are well below the surface (deeper than 25m). They are deployed by a Canadian Coast Guard ship in August, left on site for one year, and then recovered the following August. The ship also conducts a "CTD" survey, which involves lowering an instrument over the side of the ship to measure salinity, temperature and depth, at specific locations. Plans are to continue the program for 3 more years, replacing the mooring array and completing the CTD survey in August of each year, until the final recovery in 2006.

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Project Title: **Lupin Mine**

Summary:

Kinross Gold Corporation is planning to conduct a biological monitoring study for the Lupin Mine, as a requirement under the federal Metal Mining Effluent Regulations. The Lupin Mine is an underground gold mine located on the west shore of Contwoyto Lake, Nunavut, approximately 285 km southeast of Kugluktuk and 400 km northeast of the City of Yellowknife. The goal of the biological monitoring study is to investigate the effects that mine effluent has on the receiving environment. The biological monitoring study will include a fish population health survey (target species are Arctic grayling and slimy sculpin), a benthic invertebrate community survey, and a fish tissue program. Water quality and sediment quality samples will also be collected. The field sampling session is scheduled for late August and early September 2005.

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Project Title: **Mars Deep Drill - Planned Science and Technology Field Research**

Summary:

This is a new project that has only recently received funding under NASA's Astrobiology Science and Technology Instrument Development Program. The ultimate goal of this research is to develop and field test technologies that can collect micro-organisms present in the ancient Martian ground ice and to provide a science base for this investigation by the direct examination of analogue permafrost environments on Earth. Field testing will be carried out for 3 consecutive springs. This research will characterize the stratigraphic nature and distribution of massive ground ice, the age of the ice and characterize the abundance, distribution and composition of the active bacterial communities in the active

layer, sediments overlying massive ground ice, in the massive ground ice, and in the poorly consolidated tertiary bedrock that underlies the ground ice. To ensure that drilling/coring systems are capable of operating successfully on the surface of Mars, we propose to characterize relevant physical properties of rocks and of drill bits in the laboratory under Mars-like conditions of temperature, pressure and atmospheric composition. We propose to develop sampling technologies for aseptic drilling in permafrost. We plan to work in Eureka for 3 reasons, first because of the widespread occurrence of ground ice conditions; second because the area represents one of the coldest and driest ground ice environments in the Arctic; and thirdly because of the available logistical infrastructure.

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Project Title: **Coppermine Water Quality Monitoring**

Summary:

The community of Kugluktuk, through the efforts of the KAA, has been actively trying to establish a water quality monitoring program on the Coppermine River. The community feels that it is crucial to have accurate data on water quality in the river because it is the source of drinking water, and the basis for supporting the fish and wildlife resources in the area. Water quality data is particularly important due to the presence of two operating mines in the head waters of the Coppermine River and an increasing level of exploration in the watershed. The community has developed a long term, multi-phased monitoring strategy that would allow local residents to serve as environmental stewards for the Coppermine River. The proposed project covers the initial (start-up) portion of Phase 1 of the overall strategy. The 2005 program will involve on site training of students by Golder Associates (selection of sampling locations, use and maintenance of meters, recording and storage of data, collection and shipping of samples to outside laboratories etc.) Golder will also direct the initial sampling event on the lower Coppermine River, and provide program guidance for the remainder of the 2005 sampling season.

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Project Title: **The PolarDARN radar for Rankin Inlet (Kangiqsliniq)**

Summary:

A large group of international scientists have joined to use radars to study high-altitude weather systems and their effects upon the low-altitude weather we experience at the ground. The SuperDARN (Super Dual Auroral Radar Network) community, with funding and/or participation from 12 countries (Canada, US Great Britain, France, Italy, Finland, Norway, Iceland, Japan, Australia, New Zealand and South Africa), has constructed 9 radars in the northern hemisphere and 7 in the southern hemisphere (including four in Antarctica) All of the 16 SuperDARN radars are located so as to examine the "auroral zone" (the zone of northern or southern lights) at high latitudes in the northern and southern regions of the earth. There is, however, a gap in the coverage over the polar regions. The north magnetic pole lies near Eureka, Nunavut. Only two radars, to be called the PolarDARN radars, are needed to view the entire "north polar cap" region centered around the magnetic pole. The first radar would be installed in Rankin Inlet, the second in Inuvik. We already take part in science projects at two sites in Rankin Inlet-at a small hut in which a camera and a radio inosonde operate. The PolarDARN radars will be portable- easy to install and remove, with no environmental damage. The radars measure the high altitude "weather maps" (which are voltage maps, because high-altitude winds are motions of electrically charged particles driven by electrical voltages). These maps are available on the internet with only a few minutes delay. Such information is important for all satellites, because satellites fly in this high altitude weather. These satellites are extremely important to the north because they transmit most communications signals (telephone, TV, internet etc.). Recently, scientists have found that the high-altitude weather is connected to the low-altitude weather, and the PolarDARN radar observations will help us to understand these connections. PolarDARN can measure part of the energy from the Sun to the Earth, namely the energy that comes from the "solar wind". This energy goes most directly to the polar regions, so these are very important regions to study. We are very fortunate that Nunavut and the NWT provide much easier access to the northern polar regions than Antarctica to the south polar regions.

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Project Title: **Evaluation of Metal Bioaccessibility in Northern Foodstuffs**

Summary:

The purpose of this research is to resolve uncertainty in human health risk assessments of Northern communities that have not adequately addressed metal bioaccessibility. Through the use of food samples representative of the diet of Northern peoples we will provide risk management options relevant to their diet and culture. The primary goal of this sampling expedition is the collection of berries and soils from pristine and metal contaminated sites in Iqaluit, Nunavut. This will allow the relationship between metal bioaccessibility and metal concentration to be investigated (Primary Objective). Risk management strategies will be generated by comparing the relationship between bioaccessibility and concentration between food-types and food-preparation methods.

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Project Title: **An Exploratory Field Campaign under ArcticNet Project 4.3: Vulnerabilities and Adaptation to Meteorological and Related Hazards**

Summary:

Climatic conditions vary along the coast and throughout the interior of Southern Baffin Island and even within Iqaluit. Such variations are an important concern to local communities and transportation industry. However, no detailed case studies of winter storms have so far been conducted in that area. From 18 October to 17 November 2005 we are planning to conduct a small field project within Iqaluit, and in the coastal mountains northeast of Iqaluit to investigate meteorological surface conditions associated with sever winter storms. To begin to dermine surface weather condition changes around

Iqaluit, we are planning to supplement the operational surface and upper air data with data from a mobile automatic weather station as well as with 10 additional weather balloon launches. The weather station can be carried in a backpack and set up and maintained by a single person. In the field it is powered by an internal battery that is recharged with a solar panel. No motorized transport is required, and no combustion power generators will be used. The exact installation site for the weather station is indicated on the included map. No additional structures will be erected at the observation site. There will be no trace of the installation after the field project. The weather balloons will be launched from the official upper air station at the Iqaluit airport.