

Canadian National Implementation Plan for AMAP 2004/5

Canada's National Implementation Plan for AMAP comprises 43 projects being conducted under the Northern Contaminants Program. These projects are organized under three categories: Human Health, Environmental Trends Related to Human Health and International Controls, and Education and Communications. Tables 1a, 1b, and 1c list the titles of each project and Tables 2a, 2b, and 2c include full plain language summaries. Additional updates may be provided over the course of the year to reflect any new projects, particularly as they may relate to issues of interest to AMAP but not addressed by the Northern Contaminants Program (ie. acidification, radiation).

Table 1a. Human Health

Project #	Project Title	Project leader
H-1	Monitoring Spatial and Temporal Trends of Environmental Pollutants in Maternal and Umbilical Cord Blood in Nunavik	Eric Dewailly
H-2	Monitoring Temporal Trends of Human Environmental Contaminants in the NWT and Nunavut	Deborah McLeod
H-5	Characterizing Risks Associated with Fetal Exposure to Methylmercury in an Animal Model to Aid Guideline Development for Exposure in Human Pregnancy	Mike Inskip
H-6	Assessment of Archived Human Sample Extracts Collected in Northern Regions for the Brominated Flame Retardant, Hexabromocyclododecane (HBCD)	John Jake Ryan
H-10	The Nunavik Health Study: Determination of Dioxin-Like Compounds in Plasma Samples from Inuit Adults Using the DR-CALUX Bioassay	Pierre Ayotte
H-11	Inuit Health in Transition Study: the Nunavik Health Study	Eric Dewailly
H-16	Long Term Effects Following Postnatal Exposure to Breast Milk Contaminants: Is it Real?	D. Desaulniers
H-17	Developmental Neurotoxicity of a Persistent Organic Pollutant (POP) Mixture Mimicking the Exposure of Canadian Northern Populations: Effects on Molecular Endpoints, Correlation with Neurodevelopmental Outcomes and Markers of Thyroid Hormone Status	Ih Chu
H-18	Interactions Between Northern Contaminants and Omega-3 Fatty Acids and Selenium in Central Nervous System Development	M.E. Mirault
H-19	Neurotoxicological, Thyroid and Systemic Effects of In Utero and Lactational Exposure to Polybrominated Diphenyl Ethers (PBDEs) in Sprague-Dawley Rats	W. Bowers
H-20	In Vitro Examination of Food-borne Polychlorinated Pesticide Residues for Effects on Cytochrome P450 Isozyme Induction/Activity	T. Schrader
H-22	Developmental Immunotoxicity of a Commercial Polybromodiphenylether (PBDE) Mixture	G. Bondy
H-23	Decision Support Tool for Risk and Benefit Balancing of Country Food Issues in the Canadian Arctic	C. Furgal/G. Paoli

Table 1b, Environmental Trends Related to Human Health and International Controls

Project #	Project Title	Project leader
M-1	Temporal Trends of Persistent Organic Pollutants and Mercury in Landlocked Char in the High Arctic	Derek Muir
M-2	Northern Contaminants Air Monitoring: Organochlorine Measurements	Hayley Hung
M-3	Air Measurements of Mercury at Alert	Alexandra Steffen
M-4	Passive Air Sampling for Persistent Organic Pollutants in Cold Environments	Hayley Hung
M-5	New Contaminants in Arctic Biota	Derek Muir
M-7	Temporal and Spatial Trends of Contaminants in Canadian Polar Bears: Part II	R. Letcher
M-8	Contributing to International Controls on POPs and Mercury	Don Mackay
M-9	Long Term Trend Monitoring of Yukon Fish From Selected Lakes	Pat Roach
M-10	Spatial and Long-term Trends in Persistent Organic Contaminants and Metals in Lake Trout and Burbot in Great Slave Lake, NT	Marlene Evans
M-12	Temporal Trends of Heavy Metals and Halogenated Organic Compounds in Arctic Marine Mammals (Beluga, Narwhal, Walrus)	Gary Stern
M-13	Temporal Trend Studies of Heavy Metals and Halogenated Organic Contaminants (HOCs), Including New and Emerging Persistent Compounds in Mackenzie River Burbot, Fort Good Hope, NT	Gary Stern
M-14	Time-Trend Studies on New and Emerging Persistent Halogenated Compounds in Marine Mammal from the Canadian Arctic	Gregg Tomy
M-16	Temporal Trends of Persistent Organic Pollutants and Metals in Ringed Seals from the Canadian Arctic	Derek Muir
M-17	A Retrospective Analysis of PBDEs and PFOS in Yukon Fish from Three Yukon Lakes	Pat Roach
M-18	Temporal Trends of Spatial Variations in Persistent Organic Pollutants and Metals in Sea Run Char from the Canadian Arctic	Marlene Evans

Table 1c, Education and Communications

Project #	Project Title	Project leader
C-1a	Distribute and Communicate NCP CACAR II Results to Yukon First Nations and CYFN General Assembly	Cindy Dickson
C-1b	Yukon Contaminants Committee Communications 2004/2005	P. Roach
C-2b	Making Results Make Sense: A Contaminants Research Handbook for Community Professionals in Nunavut	J. Shirley
C-2c	Gathering, Disseminating, Developing and Delivering Appropriate Education and Communication Information for the Inuvialuit Settlement Region	N. Cournoyea
C-2d	On-line Contaminant Course for NWT and Nunavut	L. Chan
C-2f	Education and Communication Priority Projects: International Contaminant Activities in Support Global Instruments and Activities	S. Meakin
C-2g	Providing Contaminants Information in the Context of Regional Environmental Health Initiatives: Communications in Nunavik	S. Dery
C-2h	Communicating in Labrador on Contaminants: Responding to Community Specific Concerns and Development of a Long Term Strategy to Engage Target Audiences on Contaminant, Food and Health Issues	M. Denniston
C-2i	Communicating about Contaminants into the Future: Analyzing the Inuit Communications Survey and the Establishment of an Inuit Strategic Plan	E. Loring
C-2j	ITK General Inuit Communications Package	E. Loring
C-3a	Community Consultations in the G.S.A. 2004/2005	J. Edwards
C-3b	Simple Language Translation of Research Results in the NCP-NT	C. Heron
C-3d	Communicating and Filling the Gaps of CACAR II	K. Pennycook
C-3e	Participation and Understanding	P. Simon
C-3f	Putting Public Service Announcements from the Second Canadian Arctic Contaminants Assessment Report into K'ahsho Gotline	B. T'Selie

Table 2a, Human Health

<p>Project Title: Monitoring spatial and temporal trends of environmental pollutants in maternal and umbilical cord blood in Nunavik</p>	<p>H-01</p>
<p>Project Leader(s): Éric Dewailly, ACADRE Centre for Inuit Health and Changing Environments</p>	
<p>Plain Language Summary</p> <p>The Inuit are exposed to a wide range of environmental contaminants through their traditional diet, which includes significant amounts of fish and sea mammal fat. During the past fifteen years, several studies monitored the exposure of Nunavik’s Inuit to persistent organic pollutants and heavy metals. More recently, increased emphasis was put on health effects studies in relation to exposure to polychlorinated biphenyls, chlorinated pesticides, mercury and lead in the Hudson Bay area. This project proposes to focus on exposure assessments in Nunavik (with emphasis on the Ungava Bay area), to compare current exposure levels with those prevailing ten to fifteen years ago based on our last surveys, and additionally, to assess exposure to emerging environmental contaminants for which increasing concentrations in wildlife and human samples have been reported worldwide. Analyses will be conducted on maternal and umbilical cord blood. This study will provide 1) an update of geographical patterns of exposure; 2) information about whether exposure levels to different classes of contaminants are increasing, decreasing or remaining the same in northern populations; 3) information about the efficiency of intervention programs implemented following earlier surveys.</p>	
<p>Project Title: Monitoring temporal trends of human environmental contaminants in the NWT and Nunavut</p>	<p>H-02</p>
<p>Project Leader(s): Deborah McLeod, Inuvik Regional Health and Social Services Authority, Nunavut Department of Health and Social Services Erica Myles, AXYS Environmental Consulting Ltd. (for proposal development only)</p>	
<p>Plain Language Summary</p> <p>A territorial baseline of selected organic and metal contaminants in maternal and cord blood was established for the NWT and Nunavut between 1994 and 1999. This program aims to establish temporal trends of selected environmental contaminants in human blood and hair in the Northwest Territories (NWT) and Nunavut. This proposal outlines year two of this three-year program. Year one (2003-2004) focussed on feasibility and planning, year two (2004-2005) will include recruitment, sampling and analysis, and year three (2005-2006) of the study will be dedicated to data analysis and communication of</p>	

results. This study will involve the recruitment of pregnant women from the Inuvik region of the NWT and Baffin region of Nunavut. Participants will be interviewed prior to delivery to assess diet and lifestyle during pregnancy, and they will be asked to sign a consent form agreeing to provide blood and hair samples for the study. In the Baffin region, the monitoring program will be conducted in collaboration with Laval University to ensure that program protocols will serve both the purpose of the monitoring program and the expansion of the Nunavik infant development study. The study will provide data to international contaminant monitoring initiatives such as the Global Monitoring Plan under the Stockholm Convention. Communication activities will be ongoing throughout the program.

<p>Project Title: Characterising risks associated with fetal exposure to methylmercury in an animal model to aid guideline development for exposure in human pregnancy</p>	<p>H-05</p>
<p>Project Leader(s): Mike Inskip, HECS, Health Canada</p>	

Plain Language Summary

The manner in which the fetal brain develops means that there are particularly sensitive periods where exposure to contaminants or certain pharmaceuticals by the mother (e.g., high mercury in fish) should be especially avoided and perhaps other periods when these considerations may be less important. Although the tragedies in Minamata, Japan and in Iraq involving mercury have given scientists some clues as to nature of the damage to the developing brain suffered by the baby in utero compared to a lack of apparent symptoms in the mothers, we still do not know whether eating a single meal (or a series of meals over a short period of time) with a high methylmercury content is enough to cause fetal injury, or if it takes continuous exposure over a longer period. Despite very thorough, complex and costly human epidemiological studies, we also do not understand why pregnant women in communities who regularly consume a lot of marine fish with mercury at fairly low concentrations have children who appear to show no health effects, whereas others who consume less fish overall but periodically ingest food with much higher contaminant levels, sometimes have children who appear to have subtle or mild symptoms that may be linked to the contaminants present.

The studies to be developed in the current proposal plan to use a mouse model to help better understand the fluxes of how mercury causes underlying toxic effects when it is consumed over a short period of time but at higher concentrations. It aims to carry out these studies at the stage(s) in pregnancy which coincide with the most susceptible period of pre-natal brain injury. In addition it uses a very new technique of enriched stable isotopes of mercury. It is anticipated that the results will add to the body of evidence that may permit scientists to develop better predictions about potential risks in humans having these kinds of exposure to mercury through their eating patterns (e.g. to predict the type of brain disruption and damage that could occur if pregnant women consumed a diet with elevated mercury levels at certain times [‘critical windows’] in pregnancy).

The study is relevant to the type of decisions which need to be taken in order to safeguard health and to provide sound health advice in communities in the North and elsewhere

because: (a) fish and marine mammal consumption in many northern communities is particularly high at certain times of the year, which might coincide in some cases with pregnancies in families; and (b) we need a better understanding of how methylmercury is transferred to the brain of the fetus during pregnancy; this would be of benefit to the many regulatory agencies charged with developing human health guidelines and which are required to include an adequate safeguard for the most sensitive stage of life - the fetus.

A rapid and environmentally friendly (low solvent consumption) analytical technique for methylmercury determination will be a key part of the work this year in support of tissue analyses from toxicology studies designed to examine the mechanism of toxicity for methylmercury. The method is a micro-extraction technique (MET) using isotope dilution mass spectrometry - which should allow faster analyses and a big improvement in precision and low level measurements in the very small samples of tissues in the mouse.

Project Title:

Assessment of archived human sample extracts collected in northern regions for the brominated flame retardant hexabromocyclododecane (HBCD)

H-06

Project Leader(s):

John Jake Ryan, Health Products and Food, Health Canada

Plain Language Summary

Health Canada is presently assessing human exposure of northern populations to emerging POPs such as brominated diphenyl ethers (PBDEs) and perfluorooctane sulfonates (PFOS). This work involves the analysis of blood plasma composites from Nunavut and the Northwest Territories (collaboration and support from DIAND under NCP) and human milk from Nunavik (collaboration with INSPQ). The former blood work will be finished in the present fiscal year. The completed human milk analyses have shown a three-fold increase of PBDEs in Nunavik in less than a decade. In addition to the PBDEs, hexabromocyclododecanes (HBCD) are one of the two other classes of brominated flame retardants (BFRs) widely used in industrialized society. This compound is lipid soluble, occurs in human samples from Europe and North America and is known to biomagnify in Great Lakes food webs. Current and past exposure to this emerging POP will be assessed from all regions of the Arctic by its isomeric determination in the archived sample extracts from the above two NCP studies. Data will be available in 2004-5 to allow an estimation of the potential of HBCD to impact on the health of northerners. The information will also be used to compare with new data being generated from southern areas in Canada. No new human sample collection will be required.

Project Title: The Nunavik Health Study: determination of dioxin-like compounds in plasma samples from Inuit adults using the DR-CALUX bioassay	H-10
Project Leader(s): Pierre Ayotte, Université Laval	
Plain Language Summary Compounds that possess a chemical structure similar to that of dioxin are among the most toxic substances and can elicit a variety of effects in laboratory animals including hormonal disturbances, immune system dysfunction and cancer. There are little data on exposure of the Canadian Inuit population to these compounds and no information on possible adverse health effects possibly resulting from this exposure. In the course of the Inuit Health in Transition Study, a cohort study that will start in Nunavik in 2004, we propose to analyse plasma samples from 1000 Inuit adults for dioxin-like compounds using a cell-based assay: the Dioxin-Receptor Chemically-Activated Luciferase Expression (DR-CALUX) bioassay. We and others have obtained fairly good agreement between results yielded by DR-CALUX bioassay and those obtained with the conventional high-resolution gas chromatography/mass spectrometry methods. Since this bioassay can be conducted with as little as one ml of plasma, at a fraction of the cost of conventional analytical chemistry methods, it can be applied in the course of large scale epidemiological studies such as this one. This will allow examining possible associations between exposure to dioxin-like compounds and the incidence chronic diseases in the Inuit population.	
Project Title: Inuit Health in Transition Study: the Nunavik Health Study	H-11
Project Leader(s): Éric Dewailly, CHUQ	
Plain Language Summary The present study will be conducted in Nunavik in 2004-2005 within the framework of The Nunavik Health Survey which will permit to gather recent information regarding the health of the Inuit population of Nunavik and to compare data and verify temporal trends with data obtained in 1992 by the Santé Québec Health Survey. Moreover, this survey will be the starting point of an international Inuit cohort study which will examine the significance of the environment, diet and living conditions for the development of chronic diseases. The first objective of the present study is to verify temporal trends of contaminant exposure among the Inuit of Nunavik in updating information by the measurement of contaminant levels, traditional/country food consumption and protective nutritional factors during the 2004 Nunavik Health Survey. The second objective is to begin the monitoring of a new generation of contaminants that are of potential concern in northern regions. The third objective is to investigate the effects of contaminants on chronic diseases in the course of the international Inuit cohort study. The study will provide to the Inuit of Nunavik updated information on contaminant exposure required for clearer decisions on their food use.	

<p>Project Title: Long-term effects following postnatal exposure to breast milk contaminants: is it real?</p>	<p>H-16</p>
<p>Project Leader(s): Daniel Desaulniers, HECS, Health Canada</p>	
<p>Plain Language Summary</p> <p>Our objective is to assess potential health risks associated with postnatal exposure to mixtures of breast milk contaminants. This is a sensitive issue because the suggestion of a risk in the absence of a real one could discourage breastfeeding, and breastfeeding is highly beneficial. However, if a risk exists, exposure of fetuses during pregnancy cannot be avoided, but reducing breastfeeding intensity during critical periods can decrease it. We administered the most abundant, and “most toxic” breast milk contaminants to baby rats and observed no effects at the level of exposure received by human babies. At higher doses preliminary results suggested that the most abundant contaminants had a persistent effect on the metabolism of estrogens, whereas the “most toxic” suppressed a gene involved in DNA methylation. Estrogens are implicated in reproduction, cancers, depression, and brain development, in both genders. DNA methylation is a mechanism that could “permanently” modify cell functions, and might be an indicator of developmental effects. We propose combining the most abundant and “most toxic” contaminants, and will test effects following postnatal exposure to this more complete mixture. In addition to measuring classical indicators of effects, this study will focus on estrogen metabolism and DNA methylation.</p>	
<p>Project Title: Developmental neurotoxicity of a persistent organic pollutant (POP) mixture mimicking the exposure of Canadian northern populations: effects on molecular endpoints, correlation with neurodevelopmental outcomes and markers of thyroid hormone status.</p>	<p>H-17</p>
<p>Project Leader(s): Ih Chu, HECS, Health Canada</p>	
<p>Plain Language Summary</p> <p>Our previous NCP-funded study showed that a POPs mixture, based on the blood contaminant profiles of Canadian Arctic populations, produced neurobehavioural impairments and changes in brain gene expression in rats at doses within the range of human exposure. This project will further investigate the molecular basis of the observed neurotoxicity. We will measure changes in brain functions (gene expression and protein quantification) and examine the extent to which thyroid disruption is responsible for the observed neurobehavioural effects following exposure to the POPs mixture or to its major groups of contaminants (polychlorinated biphenyls, organochlorine pesticides and methylmercury). These results will be interpreted in light of neurobehavioural, cognitive and motor activity outcomes measured in a parallel NCP study on rats treated using an identical dosing regimen.</p> <p>A better knowledge of the molecular mechanisms underlying the effects of</p>	

<p>neurotoxicants is essential to improve risk assessment of vulnerable populations. It will provide the basis for potential ameliorative strategies to minimize health impacts of the Arctic populations exposed to persistent contaminants. The results will also provide public health officials with a better understanding of the potential detrimental effects of the environmental mixtures of POPs to which the public is exposed.</p>	
<p>Project Title: Interactions between northern contaminants and omega-3 fatty acids and selenium in central nervous system development</p>	<p>H-18</p>
<p>Project Leader(s): Marc-Edouard Mirault, CHUL</p>	
<p>Plain Language Summary</p> <p>The traditional Inuit diet is rich in omega-3 polyunsaturated fatty acids (n-3 PUFAs) and selenium but is also contaminated by environmental pollutants such as methylmercury (MeHg) and organochlorines (OCs). Epidemiological studies suggest that n-3 PUFAs present in the traditional Inuit diet are probably responsible for the low mortality rate from heart disease in this population. An ongoing cohort study of Canadian Inuit infants indicates beneficial effects of n-3 PUFAs on physical growth at birth and on some neurological outcomes in children. We propose to carry out laboratory experiments to test the hypothesis that n-3 PUFAs and selenium may have protective effects against MeHg and OC neurotoxicity during brain development. Our first term 2004-05 objective is to assess in mice the effects of selenium and fish oil-supplemented diets (rich in n-3 PUFAs) on developmental toxicity induced by MeHg in utero. We will monitor offspring survival and assess adult offspring performance in neurobehavioural tests; the results will be related to mercury burden and selenium status, antioxidant and fatty acid status in newborns' brains. The results will indicate to which extent n-3 PUFAs and selenium can protect fetal brain development from MeHg-mediated in utero neurotoxicity. A second term objective will be to assess the effect of combined selenium and -3 PUFA dietary supplementation on in utero developmental toxicity produced by an Arctic-relevant OC mixture, combined or not with MeHg. This study, to be done at CHUL/Laval University, Québec City, is expect to provide experimental evidence supporting the benefits of the traditional Inuit diet on perinatal brain development.</p>	
<p>Project Title: Neurotoxicological, thyroid and systemic effects of in utero and lactational exposure to polybrominated diphenyl ethers (PBDEs) in Sprague-Dawley rats</p>	<p>H-19</p>
<p>Project Leader(s): Wayne Bowers, HECS, Health Canada</p>	
<p>Plain Language Summary</p> <p>In the last 20 years, exposure to polybrominated diphenyl ethers (PBDEs) has been increasing in North American populations. While there is little data on human exposures in Canadian Arctic populations, PBDEs have been found in the Arctic environment and wildlife. Because native Arctic populations rely on wildlife as part of their diet, it is likely that they are also exposed and there is concern that levels of PBDEs may be</p>	

increasing faster in the Arctic than elsewhere. It is thought that neurobehavioural function, thyroid function and cancer are the most likely consequences of PBDE exposure and that fetuses and infants are the most susceptible populations. Despite this, there is little toxicological information about the effects of exposure to PBDEs during pregnancy and lactation. The current study aims to evaluate the effects of exposure to the PBDE mixture DE-71 on neurotoxicological and thyroid outcomes in the rodent model. In addition, because of the limited data available, this study will also examine systemic toxicity after perinatal PBDE exposure. This study will examine the impact of PBDEs over the life cycle of exposed animals to determine the persistence of health effects as well as the potential for adverse health effects to emerge as animals mature. Levels of PBDEs will be evaluated in both mother and offspring to facilitate comparison of exposures between animals and human populations and thus exposure levels at which adverse health effects may occur.

<p>Project Title: In vitro examination of food-borne polychlorinated pesticide residues for effects on cytochrome P450 isozyme induction/activity</p>	<p>H-20</p>
<p>Project Leader(s): Timothy J. Schrader, Health Products and Food, Health Canada</p>	

Plain Language Summary

The polychlorinated pesticides chlordane and toxaphene are persistent environmental contaminants of particular concern in the Canadian Arctic. Both pesticides are complex mixtures and most toxicological examinations of health effects have concentrated upon the technical mixtures as originally produced. However, residue analyses of wildlife consumed as traditional Inuit country foods have shown that certain isomers or metabolites accumulate, and a similar profile has been demonstrated in samples of human milk and adipose tissue. The potential health concerns posed by these compounds in particular have not been adequately examined. Preliminary work in the laboratory has shown that technical mixtures of both toxaphene and chlordane inhibit the induction of different classes of drug-metabolizing enzymes in liver cell cultures. These results suggest that polychlorinated pesticide residues may interact with the metabolism and detoxification of chemicals such as steroid hormones normally metabolized through this system, as well as prescription drugs. In order to better characterize this potential health risk, the present project proposes to examine the major persistent chlordane and toxaphene isomers/metabolites for (a) effects on the induction of drug metabolizing enzymes in a rat liver cell line in culture used as a model and (b) direct effects on enzyme activity using commercial kits containing cloned human enzyme subtypes responsible for drug metabolism/detoxification.

Table 2b, Environmental Trends Related to Human Health and International Controls

<p>Project Title: Temporal trends of Persistent Organic Pollutants and Mercury in Landlocked char in the High Arctic</p>	<p>M-01</p>
<p>Project Leader: Derek Muir and Gunter Köck</p>	
<p>Plain Language Summary: This purpose of this project is to investigate changes in concentrations of contaminants over time in landlocked Arctic char from lakes in Nunavut. Our approach is to measure concentrations of pollutants such as mercury and POPs in the fish each year to see if levels are decreasing or increasing. The project began in 1999 by studying Char and Resolute Lakes because samples had been previously collected from both lakes in 1993. Since then we have continued to sample Resolute Lake each year and have added Amituk Lake (2001 - 2003), and Hazen Lake (2003) in northern Ellesmere Island which were originally sampled in the early 1990s. All of the fish collected so far have been analysed for mercury and other metals. A smaller number have been analysed for PCBs and other persistent organic pollutants (POPs). Levels of mercury levels in the fish are relatively low in Resolute Lake compared to some of the other lakes in the area. Concentrations of mercury in the char in Resolute Lake have declined by 10 to 20% from 1993 to 2002 and remained constant in Lake Hazen (1990-2003). Mercury concentrations have actually increased in Char Lake and Amituk Lakes over the same period by about 2-fold and are above guidelines for human consumption. However, this increase can be partly explained by the fact that more larger fish have been caught recently than in the early 1990s. PCBs have declined slightly in char from Resolute, and Char Lake but not in Amituk Lakes over the period 1992/93 to 2002. We have also found that concentrations of brominated flame retardants (BFRs) are increasing in Resolute Lake char. For 2004-05 our plan is to analyse POPs (PCBs, chlorinated pesticides such as DDT as well as BFRs) in fish from Resolute, Char, Amituk lakes and from Lake Hazen that were collected in 2003. We have previous data on contaminants in char from Hazen Lake (1990 for PCBs) and archived samples are available from 1992 and 2001. We are particularly concerned that climate warming may result in an increase in mercury in small lakes, or in those that are glacier fed. Sampling will be carried out by hand methods or gill netting as we have done since 1997 in Resolute and other lakes. We have found that the gill nets are only catching fish at the 7+ year classes and beyond. The fishing effort on the lakes near Resolute will utilize the traditional knowledge of local people in the community. The project budget also includes funding to hire a local person to help with fish sample collection and sample preparation. Fishing would be conducted in the first two weeks of August. It would involve day trips by helicopter to lakes near Resolute assuming that we have aircraft support from the Polar Continental Shelf Project. Results of the project will be reported to the Hamlet council of Resolute Bay in 2004.</p>	

Project Title: Northern contaminants air monitoring: organochlorine measurements.	M-02
Project Leader: Hayley Hung	
Plain Language Summary: The atmosphere is the main pathway for organochlorine contaminants to enter Arctic ecosystems. This project involves the measurement of these contaminants in the Arctic air. It is part of a continuing monitoring program started in 1992. The measurement of amounts and types of contaminants involves collecting large volumes of air through filters. The filter samples are then analyzed in a laboratory. Results from this continuing project are used to negotiate international control agreement and to test atmospheric models that explain the transport of contaminants from sources in the South to the Arctic. This phase of the project will see the continuation of measurements at Alert as our baseline site where trends are showing declining air concentrations of past-used pesticides, e.g. chlordanes and hexachlorocyclohexanes (HCHs), but steady trends for current-use pesticides, e.g. endosulfan I. These trends indicate the effectiveness of international control on the release of these pollutants.	
Project Title: Air measurements of mercury at Alert	M-03
Project Leader: Alexandra Steffen	
Plain Language Summary: <p style="text-align: center;">Mercury is a priority pollutant found at elevated levels in the tissues of aquatic animals in the Arctic. The goal of this study is to measure time trends of atmospheric Hg in the Arctic and to evaluate the role of the atmosphere in transferring Hg to the Arctic ecosystem. Both natural and man-made sources contribute to the mercury found in the Arctic. The mercury is found in the air in the vapour phase or attached to airborne particles. Globally, elemental mercury vapour stays in the atmosphere for long periods of time (up to 2 years) but mercury on particles and reactive gas phase mercury can be rapidly deposited onto the snow and ice surfaces. Once deposited, this mercury can enter the food chain. This study will help determine if concentrations of mercury in air, on particles and in snow at Alert are increasing or decreasing. It will provide data to assess how much mercury is transported to the Arctic by the atmosphere and how much is deposited onto the snow/ground surfaces and vegetation. The data generated from this study will aid in understanding the impacts of atmospheric mercury in the Arctic ecosystem and ultimately its effect on human health.</p>	
Project Title: Passive air sampling for persistent organic pollutants in cold environments	M-04
Project Leader: Hayley Hung	

Plain Language Summary:

Under the Northern Contaminants Program (NCP), air concentrations of persistent organic pollutants (POPs) have been measured in the Canadian and Russian arctic since 1992. This is mainly because air is the major transport pathway for these pollutants to enter the arctic ecosystems. POPs can be transported over great distances and tend to bioaccumulate and biomagnify through food chains which resulted in unusually high exposure of the northern populations relying on a high fat diet.

The conventional technique used to determine air concentrations of POPs involves active sampling. This technique relies on a pump to pass air through the sampler which traps the compounds of interest. The limitation of this approach is that it is expensive, labour intensive and is limited to sampling at locations where electricity is available. It is thus difficult to sample in the remote arctic and the high cost prevents simultaneous sampling at multiple locations. In FY03/04, work has begun on the development of two types of passive air sampling devices for POPs in cold, remote locations which require neither the use of a pump nor electricity, but rely on the devices' capability to directly take up contaminants from the atmosphere. This year, we propose to continue the development of these samplers to enhance their performance by improving their configurations and experimenting with the different types of sampling media used to capture POPs to optimize sampling capacity under cold (subzero) conditions.

Project Title:

New Contaminants in Arctic Biota

M-05

Project Leader:

Derek Muir

Plain Language Summary:

This two year project is in the process of determining new chemical contaminants in Arctic animals which are important food sources for northern people, e.g. ringed seals, beluga, seabirds. We have focussed on chemicals recently reported for the first time in the Canadian Arctic Assessment Report but for which we have very little information on levels across the north or on changes in concentrations over time. Unlike the persistent organic pollutants (POPs) measured in most previous NCP projects, most of the chemicals determined in this study are in everyday use as flame retardants, stain repellents and lubricants but they have the potential for long range transport to the Arctic and accumulation in top predators. The work in 2004-05 will focus on temporal trends of these contaminants in ringed seals and seabirds. The work will be done mainly in analytical chemistry laboratories, however, sample collection on Prince Leopold Island in Lancaster Sound, in cooperation with CWS scientists, is also proposed.

Project Title:

Temporal and spatial trends of contaminants in Canadian polar bears:
Part II

M-07

Project Leader: Robert Letcher	
Plain Language Summary: The polar bear (<i>Ursus maritimus</i>) is the apex predator of the arctic marine ecosystem and marine foodweb, and an integral component of Inuit culture. There are significant concerns about the effect of high organic and metal contaminant concentrations in tissues of polar bear, and subsequently for the humans who consume them. Levels of polychlorinated biphenyls (PCBs) and organochlorine (OC) pesticide contaminants have been monitored in western Hudson Bay polar bears throughout the 1990s, however there has not been a comprehensive study on the spatial distribution of organics or metals in Canadian polar bears since the late 1980s and early 1990s. In samples of fat or liver, we recently determined persistent organic pollutants (POPs), including established (e.g., PCBs, chlordanes and DDTs) and “new” chemicals (polybrominated diphenyl ethers (PBDEs), methylsulfone PCBs and perfluorinated compounds), and metals in tissues of bears from populations spanning the Canadian arctic. Female bears between the ages of 5 and 15 years (to reduce age effects) were selected from those harvested in Nunavut and the Northwest Territories and collected in the 2001-2002 season. The present funding request will permit, 1) the analysis of muscle for stable isotope (nitrogen and carbon) to assess trophic level in the food web of each population, and 2) the completion of the data interpretation, and presentation and publication of results by the end of the 2004-2005 fiscal year.	
Project Title: Contributing to International Controls on POPs and Mercury	M-08
Project Leader: Donald Mackay	
Plain Language Summary: A global model of contaminant fate (the Berkeley-Trent, or “BETR”-World model) was developed as a result of previous NCP contracts and applied to an organic substance, α -HCH. In this continuation of that project it is proposed to use this model to describe and predict the fate of other Persistent Organic Pollutants (POPs) and mercury globally and especially as they are transported to the arctic ecosystem. It is recognized that the only feasible approach to reducing levels of these contaminants in the ecosystem in general and human foods in particular, is to reduce emissions from all global sources and allow these levels to fall by natural removal processes. Encouraging such reductions internationally requires information such as: Where do the contaminants originate? How are they transported? Are we sure that these substances are subject to long-range transport? What new substances are of concern for which preventative measures should now be taken? How long will it take for reductions to become effective? Answers to these questions enhance Canada’s ability to influence international negotiations and agreements. These answers can be provided by global scale dynamic	

mass balance models of contaminant sources and fate.

The objective of this proposal is to generate scientific results and refereed publications which will be influential in international negotiations to reduce emissions of POPs and mercury. The aim is thus to apply our existing BETR-World model to these POPs and especially to mercury, thus exploiting and continuing the work done in previous NCP contracts. The intent is that the contract be with DMER Ltd., but DMER will subcontract to the Canadian Environmental Modelling Centre (CEMC) at Trent University under terms of an existing agreement between DMER and Trent University.

Project Title:

Long Term Trend Monitoring of Yukon Fish From Selected Lakes

M-09

Project Leader:

Patrick Roach

Plain Language Summary:

The Yukon has monitored organochlorine and metals contaminants in its traditional foods since 1993. The objective of this project is to *maintain the temporal data set for important subsistence fish species*. The past research has monitored three Lakes selected to represent the majority of Yukon Lakes and two primary subsistence fish species. This project is intended to focus on the two subsistence fish species for which we have the largest data sets and time points; lake trout and burbot and the Lakes for which we have the most complete temporal trends data; Laberge and Kusawa.

The project will allow us to maintain the current temporal data on contaminants levels in Yukon lake trout and burbot and to continue to assess the trends of bioaccumulating substances such as mercury, PCBs, DDT, and toxaphene. Samples collected will also allow for the future evaluation of trends for current use chemicals such as brominated flame-retardants (PBDEs, HBCDD), fluorinated organic compounds (PFOS), polychlorinated *n*-alkanes (SCCPs, MCCPs), PCNs, and other contaminants that are as yet unknown. These trend results will allow the Yukon Contaminants Committee to communicate advice on the consumption of traditional foods in a confident manner and also determine the effectiveness of international controls. All of the samples collected will have sub-samples added to the Yukon tissue archive and the results will be included in the Yukon Contaminants database.

Project Title:

Spatial and long-term trends in persistent organic contaminants and metals in lake trout and burbot in Great Slave Lake, NT

M-10

Project Leader:

Marlene Evans

Plain Language Summary:

Our study is designed to find out whether contaminant levels are changing in lake trout and burbot in Great Slave Lake and, if so, why. We

want to look at two regions of the lake. First, we want to look at the West Basin because it receives contaminants from the Slave River and the air. We also want to look at fish in the East Arm because they receive most of their contaminants from the air. We think that these two regions may show different time trends. So far, there is some evidence of decreasing contaminant concentrations in fish in the East Arm (Lutsel K'e) but not in the West Basin. We want to look at lake trout because they are the fish most commonly consumed and harvested throughout the lake. Lake trout would be collected from the commercial fisheries, because they are not abundant near Fort Resolution, and at Lutsel K'e. We also want to look at burbot liver because contaminant levels can be high in this organ. Burbot live near Fort Resolution (by the Slave River inflow) in addition to the East Arm. We collected data on these fish from in the mid 1990s and then from 1999-2002. We propose to continue these collections and monitoring. We are focussing our analyses on contaminants such as PCBs, DDT, toxaphene and mercury and will analyze a subset of fish for the new compounds of concern. Length, age, weight, lipid (fat) content, and sex are being determined for each fish along with stable isotope measures of feeding.

<p>Project Title: Temporal trends of heavy metals and halogenated organic compounds in Arctic marine mammals (beluga, narwhal, walrus and ringed seal).</p>	<p>M-12</p>
<p>Project Leader: Gary Stern</p>	

Plain Language Summary:
The objectives of this project are to maintain current data on contaminant levels in marine mammals and to continue to assess the temporal trends of bioaccumulating substances such as heavy metals and halogenated organic compounds (HOCs). This will allow us to determine whether contaminant levels in the marine mammals, and hence exposure to Arctic people who traditionally consume them, are changing with time. These results will also help to test the effectiveness of international controls and, in conjunction with projects such as CASES (Canadian Arctic Shelf Exchange Study) and ArcticNet, to understand the effects that climate variation may have on the contaminant levels in these animals and the health of the stocks.

<p>Project Title: Temporal trend studies of heavy metals and halogenated organic contaminants (HOCs), including new and emerging persistent compounds, in Mackenzie River burbot, Fort Good Hope, NWT.</p>	<p>M-13</p>
<p>Project Leader: Gary Stern</p>	

Plain Language Summary:
The objectives of this project are to maintain current data on contaminants levels in Mackenzie River burbot and to continue our assessment of the temporal trends of bioaccumulating substances such as heavy metals (mercury, selenium, arsenic), PCBs, DDT, toxaphene and selected current use chemicals such as brominated flame retardants

(polybrominated diphenyl ethers [PBDEs] and hexabromocyclododecane [HBCD]), fluorinated organic compounds (perfluorooctanesulfonate [PFOS]) short and medium chain chlorinated paraffins (SCCPs, MCCPs) and polychlorinated naphthalenes (PCNs). The results of this will allow us to determine whether contaminant levels in burbot, which is an important food source to northern peoples, are increasing or decreasing with time. These results will also help to test the effectiveness of international controls. Many of the organochlorine compounds will be banned and restricted under international protocols (Århus Protocol, Stockholm Convention on Persistent Organic Pollutants), while a number of the new and current use chemicals (PBDEs, PCNs, SCCPs) are being assessed for possible addition to these agreements.

Project Title: Time-trend studies on new and emerging persistent halogenated compounds in marine mammals from the Canadian Arctic.	M-14
Project Leader: Gregg Tomy	

Plain Language Summary:
 Changes in the inputs/emissions of chemicals into the environment are reflected in changes in concentrations of chemical contaminants in wildlife over time (OSPAR Commission, 1999, pp. 1-49). This project will use this principle and assess the changes in concentrations of new persistent halogenated contaminants in marine mammals (beluga, narwhal, walrus and ringed seal) from the Canadian Arctic. The animals chosen for our study are part of the traditional diet of northern people. Our focus will be on chemicals identified in the Canadian Arctic Contaminants Assessment Report II (CACAR II) as a priority [polybrominated diphenyl ethers (PBDEs), fluorinated sulfonic and alkanolic acids (perfluorooctane sulfonate (PFOS), perfluorooctanoic acids (PFOA)), short and medium chain chlorinated paraffins (SCCPs and MCCPs) and, polychlorinated naphthalenes (PCNs)] and others that have since attracted more recent attention [hexabromocyclododecane (HBCD), and neutral PFOS-precursors: N-ethylperfluorooctane sulfonamide (N-EtPFOSA) and ethylperfluorooctane sulfonamide (PFOSA)]. This is the first time trend study to focus on marine mammals for many of these compounds (HBCD, PFOS, PFOA, SCCPs, MCCPs and PCNs). This project will also fulfill part of Canada's obligations to existing international agreements (e.g., Stockholm Convention, Århus Protocol).

Project Title: Temporal trends of persistent organic pollutants and metals in ringed seals and walrus from the Canadian Arctic	M-16
Project Leader: Derek Muir	

Plain Language Summary:
 The objective of this project is to determine changes in concentrations of contaminants such as PCBs and mercury in blubber and liver of ringed seals and walrus from locations

previously studied in the 1980s and early 1990s. During 1999-2003 the project collected ringed seal samples with help of the HTAs in 11 communities (Arctic Bay, Arviat, Grise Fiord, Kangiqsujuaq (Wakeham), Kangiqsualujjuaq (George River), Holman, Inukjuaq, Mittimatalik (Pond Inlet), Pangnirtung, Quaqtaq, Qausuittuq (Resolute Bay), Sachs Harbour). We used samples of blubber of female seals to study trends in concentrations of PCBs and other POPs and liver and kidney of male and female seals to examine trends in mercury and other heavy metals. Combined with published results we were able to examine trends over 25 year period at 3 locations and over 12 to 15 years at 8 other locations. Concentrations of most POPs were lower in the late 1990/early 2000s compared to the 1970/80s and early 1990s, however, the extent of declines varied widely. ΣDDT had the largest decline (1.7x to 3.3x) while PCBs declined 1.6-2.4x over 25 years. Trends for mercury varied widely among the seal populations. Mercury increased 2-3x at three locations (Mittimatalik, Hudson Strait and Holman) and declined by 1.5-2x at Qausuittuq, Ungava Bay and Sachs Harbour and showed no change at Arviat and Inukjuaq. Overall there appears to be no geographically widespread increase in mercury in ringed seal liver. We propose to continue sampling at these communities plus others with data from the 1980s, at 4 or 5 year intervals. For 2004-05 we will collect seal samples from Arctic Bay, Qausuittuq, Gjoa Haven and Mittimatalik as well as walrus samples from Inukjuak and Akulivik. All sampling will be done with the help of HTAs in each community who are supplied with sampling kits and instructions. Hunters are paid for each animal collected and HTAs receive funding to cover coordination and administrative costs.

Project Title:

A Retrospective Analysis of PBDEs and PFOS in Yukon Fish From Three Yukon Lakes

M-17

Project Leader:

Patrick Roach

Plain Language Summary:

The Yukon has monitored organochlorine and metals contaminants in its traditional foods since 1993. The objective of this project is to *develop a temporal data set for important subsistence fish species and emerging contaminants*. Past research has monitored three Lakes selected to represent the majority of Yukon Lakes and two primary subsistence fish species. This project is intended to focus on the two subsistence fish species for which we have the largest data sets and time points; lake trout and burbot and the three trend Lakes; Laberge, Quiet and Kusawa.

The project will utilize the existing sample archive and samples portions from recent work on the trend Lakes for POPs and mercury to generate a temporal trend for emerging contaminants in Yukon lake trout and burbot. The analysis will be limited to two of the “new” current use chemicals classifications; brominated flame retardants (PBDEs, HBCDD), and fluorinated organic compounds (PFOS). The results will allow the Yukon Contaminants Committee to communicate advice on the consumption of traditional foods, evaluate future monitoring directions, and determine the effectiveness of international controls. The results will be included in an updated Yukon Contaminants database.

Project Title: #88 - Temporal trends and spatial variations in persistent organic pollutants and metals in sea run char from the Canadian Arctic	M-18
Project Leader: Marlene Evans	
<p>Plain Language Summary: This study will find out what the levels of contaminants are in char when these fish return from feeding in the ocean in the summer. We want to find this out because Inuit communities are being advised to eat more char and less seal, beluga, and walrus in order to reduce the amount of contaminants they consume. We also want to find out if contaminant levels are the same across the Arctic or if they are higher in some areas than others. Finally, we want to find out if contaminant levels have gone up or down since the last time they were measured. This summer, we want to measure contaminants in char at Paulatuk, Gjoa Haven, and Pangirtung. This will allow us to compare levels from the western side to eastern side of the Arctic. We will coordinate our studies with other researchers who will look at contaminants in seal or beluga in these communities. This will allow us to compare the amount of contaminants in food in char and mammals. Community members would collect the fish or work with us in collecting the fish. We propose to visit two communities to talk about our study, see the size of the run, and show people how to sample fish for scientific study.</p>	

Table 2c, Education and Communications

<p>Project Title: Distribute and communicate NCP CACAR II results to Yukon First Nations and CYFN General Assembly</p>	<p>C-1a</p>
<p>Project Leader(s): Cindy Dickson, Manager, Northern Contaminants Program, Council of Yukon First Nations</p>	
<p>Plain Language Summary</p> <p>The Northern Contaminants Program was established in 1991 in response to concerns about human exposure to elevated levels of contaminants in fish and wildlife species that make up the traditional diets of northern Indigenous peoples. Under NCP Phase I research was conducted to determine the levels, geographic extent and source of contaminants that were entering the north. Results from NCP I was published in the 1997 Canadian Arctic Contaminants Assessment Report (CACAR).</p> <p>NCP II began in 1998 and focused on the impacts and risks to human health that may result from current levels of contamination in key Arctic food species. The results of NCP II have been published in CACAR II.</p> <p>The current focus of the program is to address high priority areas, such as communities where people are being exposed to contaminant levels of concern to health authorities. Although the Yukon Territory is not a high priority area, The Council of Yukon First Nations is still a part of the Northern Contaminants Program and will need to provide input to the NCP Management.</p>	
<p>Project Title: Yukon Contaminants Committee Communications For 2004/2005</p>	<p>C-1b</p>
<p>Project Leader(s): Pat Roach, Department of Indian Affairs & Northern Development, Whitehorse, Yukon. (Representing the Yukon Contaminants Committee)</p>	
<p>Plain Language Summary</p> <p>The Yukon Contaminants Committee has operated since 1991 and continues to keep Yukon people informed of the Northern Contaminants Program’s initiatives. The recent survey review (2003-2004) of past Yukon communications activities and the curriculum materials produced needs to be evaluated in order to develop a complete strategy for future communications and educational activities in the Yukon.</p> <p>One important aspect of the emerging strategy will be the communication of contaminants information on traditional foods and their benefits back to the communities.</p>	

A preliminary review of the community survey questionnaires, identifies the need for community workshops. As there are 14 communities in the Yukon, these workshops will be spread over a period of three years.

As part of our preparations for future communications, a review and update of the Yukon Contaminants Database is past due and needs to be completed prior to any future distribution of this material.

<p>Project Title: Making Results Make Sense: A Contaminants Research Handbook for Community Professionals in Nunavut</p>	<p>C-2b</p>
<p>Project Leader(s): Jamal Shirley, Manager, Research Design and Policy Development, Nunavut Research Institute</p>	
<p>Plain Language Summary This project will develop a plain language handbook to help community professionals in Nunavut better comprehend, interpret, evaluate and convey contaminants research results. The handbook is designed specifically for frontline workers (e.g. community health representatives, renewable resource officers, HTO secretary managers, community liaison officers, municipal administrators, interpreter/translators, etc.) who, as part of their jobs, are occasionally presented with contaminants research findings and who are asked (or expected) to help convey this information to the public and/or help address community members' questions about research results. Using examples from Nunavut, the handbook will explain the various figures, tables, charts, graphs, and statistics that are employed to present findings from NCP biomonitoring and human health studies to Nunavummiut. The handbook will offer provide tips about how to comprehend, evaluate this information, how to communicate results to the Nunavut public, and about how to respond to and relay local questions and concerns about contaminants research. The handbook will also describe how and why particular field and laboratory methods are employed in NCP human health research and biomonitoring studies. A glossary of technical terms related to research will be included. Information from relevant education and communication projects completed under NCP I and II (e.g. frontline worker training materials) will be revised and incorporated in the handbook. The handbook will be printed as a 5.5 X 8.5 size booklet in English and Inuktitut syllabics (30 pages per language), and will be circulated widely to community professionals throughout Nunavut.</p>	
<p>Project Title: Gathering, disseminating, developing and delivering appropriate education and communication information for the Inuvialuit Settlement Region</p>	<p>C-2c</p>
<p>Project Leader(s): Nellie J. Cournoyea, Chair & CEO, Inuvialuit Regional Corporation</p>	
<p>Plain Language Summary</p>	

The Inuvialuit Settlement Region (ISR) remains concerned about the relatively new information from the Canadian Arctic Contaminants Assessment Report II (CACAR-II) report as well as all the previous reports and studies that have been conducted in our Arctic Regions. Much of this information is good news for the people living in the ISR because it shows that levels of certain Persistent Organic Pollutants (POPS) and Heavy Metals are below some of the Health Canada guidelines. However, these reports show some disturbing results as well, especially to people who eat a lot of marine mammals. In the ISR most communities harvest are dependent on marine mammals as an important nutritious source of nutritious food and it is vital that they remain informed of any concerns related to this source so they in turn are able to make informed and educated decisions. thus require to continue to review and be informed about results to make informed and educated decisions. In addition As well, information coming out of the Inuit Survey, conducted in both our and other region and regions across the north this past year, requires needs our direct involvement to participate in the process of analysis and then dissemination of that information - which will then need to be transferred back into our communities and then to be used as the basis for the development of a long term Education and Communication Strategy. In order for the ISR to be informed about wise food choices we will need to be coordinating our efforts between NCP researchers, Inuit Tapiriit Kanatami and our communities in an ongoing basis. This proposal will enable the ISR to continue the process of developing the required information and thus to prepare those to offer communication, research and liaison activities necessary to effectively communicate information on contaminants in the food chain and the environment – thus , enabling Inuvialuit and all community members in the ISR to make informed decisions.

Project Title: On-line Contaminant Course for NWT and Nunavut	C-2d
Project Leader(s): Laurie H.M.Chan, Ph.D.School of Dietetics and Human Nutrition, McGill University	

Plain Language Summary

McGill University, in collaboration with the Department of Health and Social Services of the Government of Nunavut and the Government of Northwest Territories (NWT) will develop, coordinate, deliver and evaluate an online (Internet-based) course on contaminants and food safety for frontline health workers (Canada Prenatal Nutrition Program (CPNP) workers, Home and Community Care (H&CC) workers, Community Health Representatives (CHRs), Aboriginal Diabetes Initiative (ADI) project workers) as well as people working in the area of renewable resources (Hunters’ and Trappers’ Organizations, (HTOs), Renewable Resource officers, Environment officers). The goal of the online course is to improve or develop skills and knowledge of the targeted workers in the topic areas of contaminants in traditional food, contaminants and health, and food safety and food choice. The proposed work will build on what has been learned from the previous three years of online course delivery to health workers in Nunavut and NWT

<p>Project Title: Education and Communication Priority Projects: International Contaminant Activities in Support Global Instruments and Activities</p>	<p>C-2f</p>
<p>Project Leader(s): Stephanie Meakin M.Sc. Technical Advisor Inuit Circumpolar Conference (Canada)</p>	
<p>Plain Language Summary As outlined at the November 5-6, 2003, Management Committee meeting, the NCP Policy Objective is: To reduce and, wherever possible, eliminate contaminants from long-range transport sources in traditional / country foods, while providing information that assists individuals and communities in making informed decisions about their food use.</p> <p>One of the four priorities, outlined at that meeting, to meet this objective include:</p> <ul style="list-style-type: none"> • Meeting Canada’s obligations under the Stockholm and LRTAP Conventions (temporal trends and assessing new chemicals of concern) <p>In identifying the new policy thrust priorities to address the human health effects of contaminants in the north, “the evaluation of whether the legal measures of LRTAP and Stockholm agreements are achieving the reductions in human exposures in the Arctic” was identified as an area of interest. In order to assess the performance of international, circumpolar and regional initiatives and provide relevant and useful information on international activities to Inuit communities and the general public, ICC Canada will undertake a series of communication activities. These activities and their products will ensure that the Inuit specific results within CACAR II and the data generated in Inuit communities is fully reflected in international, circumpolar and regional decision-making and that the utility of the data is effectively used to review and move relevant initiatives forward.</p>	
<p>Project Title: Providing Contaminants Information in the Context of Regional Environmental Health Initiatives: Communications in Nunavik</p>	<p>C-2g</p>
<p>Project Leader(s): Dr. Serge Déry, MD, Nunavik Regional Board of Health and Social Services</p>	
<p>Plain Language Summary This project will return results of the Inuit Communications Survey to the communities of Nunavik, as well as gather and develop appropriate information for the presentation explanation of contaminants research and findings in the region via the Nunavik Health Survey which will be conducted this August – September in all communities. The analysis of survey results will be used to develop a 5 year regional strategy for communications on contaminants, nutrition and health issues in the region with</p>	

measurable goals and objectives.

Specifically, this project will:

- Gather and adapt, and where appropriate develop, communication material to explain contaminants related research, recent results and their meaning for presentation to communities via the conduct of the Nunavik Inuit Health Survey to be conducted in August – September 2004;
- Present the material to participants and communities via the community visits and conduct of research under the Nunavik Inuit Health Survey;
- Deliver and discuss the results of the Inuit population survey on communications and perceptions of contaminants with the 14 communities participating in this survey in Nunavik;
-

Develop a long term communications strategy / plan for Nunavik on contaminants, health and nutrition for use in the region and with other Inuit regions for the national Inuit communications strategy development;

Project Title:

Communicating in Labrador on Contaminants: Responding to Community Specific Concerns and Development of a Long Term Strategy to Engage Target Audiences on Contaminant, Food and Health Issues

C-2h

Project Leader(s):

Mary Denniston, Research Department, Labrador Inuit Association

Plain Language Summary

Labrador Inuit are sustained by the animals, birds, plants and fish of the region. Research reported in the reports of CACAR-II shows that contaminants are present in these food sources due to contamination of the environment through short range and long range atmospheric pollution. The levels of contaminants in these foods which sustain people in Labrador and potential effects they may have on residents of the coastal communities are of concern to the Inuit of Labrador. Evidence from Nunavik is showing subtle effects on unborn children due to the consumption of wild foods. Just this past year, LIA and LIHC in cooperation with the Environmental Sciences group of Department of National Defense, released a health advisory for the consumption of wild foods in the Saglek area because of the potential for related health effects. Both of these issues are making it increasingly important to explain this information, the current state of knowledge on contaminants, and the related benefits and risks of wild foods to the population of Labrador. In order for Labrador Inuit to be informed about wise food choices the LIA Research Office must coordinate efforts between NCP researchers, Inuit Tapiriit Kanatami and our communities. Similarly, we must develop a long term strategy to orient communications activities into the future and ensure that we are fulfilling the responsibility of informing the public of research activities and results, gathering concerns and preoccupations on these issues, but all the while learning how to improve

our methods and techniques for engaging the public and supporting informed decision making. Two critical steps in this process will be the review and communication of the results from the Inuit Communications Survey conducted in 2003-04 in all coastal communities as well as the development of a grounded approach to engaging young women and informing them, as an identified “at risk” group, about these issues. This proposal will enabled the Labrador Inuit Association Research Office to continue these communication, research and liaison activities, in order to effectively communicate information on contaminants in the food chain and the environment, enabling Labrador Inuit to make informed decisions now and into the future.

<p>Project Title: Communicating about contaminants into the future: Analysing the Inuit Communications Survey and the Establishment of an Inuit Strategic Plan</p>	<p>C-2i</p>
<p>Project Leader(s): Eric Loring, Senior Researcher, Environment Department, Inuit Tapiriit Kanatami</p>	
<p>Plain Language Summary A great deal has been learned about contaminant transport, levels in the Arctic environment, and human exposure to these substances in the past two decades and the Northern Contaminants Program and their Aboriginal Partners and regional representatives have delivered much of this information to communities and individuals to support informed decision making in the North. The activities used to disseminate this information have been varied, ranging from print media to spoken word and we are just now conducting evaluative exercises to increase our understanding of successes and challenges related to the delivery of this information. With increasing knowledge regarding the potential effects of these substances on infant health and development in high exposure regions, the delivery of this message has become more complex and difficult. Additionally, with the establishment of the Northern Contaminants Program as a long term program under Indian and Northern Affairs, some degree of continuity exists for investigating these issues and providing this information to support wise food choices in the future. It is for these reasons, that Inuit Tapiriit Kanatami proposes to convene an Inuit Communications Working group to discuss and plan the future of communications activities and research in Labrador, Nunavik, Nunavut and the Inuvialuit Settlement Region. The Committee will meet via teleconference and twice face to face during the year to review past activities, set priorities and develop a strategic plan for the communicating about contaminants in Inuit regions in the future. In 2003-2004, a common Inuit Communications Survey was applied in Labrador, Nunavik, Nunavut and the Inuvialuit Settlement region. This survey must now be analysed to help establish goals for future communications activities and research. The analysis of this survey will be the first step in this planning process.</p>	
<p>Project Title: ITK General Inuit Communications Package</p>	<p>C-2j</p>

<p>Project Leader(s): Eric Loring, Senior Researcher, Environment Department, Inuit Tapiriit Kanatami</p>	
<p>Plain Language Summary</p> <p>The communication of contaminants information in Inuit regions has involved the development of numerous forms of materials and the use of various methods for their distribution. Some of these materials have been evaluated and shown to be very valuable in communicating specific issues to the general public. Only recently, has material specific to Inuit and some target audiences in Inuit regions been produced (Inuit public Country Food posters, Fact sheet for Women of Child Bearing Age in Nunavik, Fact sheet for Nunavut on Country Food Benefits etc.). These audience specific materials are showing to be effective in providing detailed information to the intended audiences. However, many of these materials have been produced in one region but are of value to all Inuit regions. It is for this reason, that ITK proposes to gather and review the Inuit specific materials produced to communicate on contaminants and country food issues, adapt and reproduce (including translation) those that are applicable to all Inuit regions, and assemble a general Inuit Communications Package of this material. If gaps are identified in this material, new items will be developed, however it is expected that this number would be very small as a great deal of information already exists today (or was produced in the past) that remains relevant. This material will then be distributed to all Inuit regions as it will be translated into each of the regional dialects.</p>	
<p>Project Title: Community Consultations in the G.S.A. 2004/2005</p>	C-3a
<p>Project Leader(s): John Edwards, Gwich'in Tribal Council</p>	
<p>Plain Language Summary</p> <p>The Gwich'in Community Liaison will continue to promote dialogue and information between the Gwich'in communities, Gwich'in Organizations, NCP representatives, (NWTECC) NCP scientists,</p> <p>The Gwich'in Community Liaison will facilitate the communication of the results of the Past CACAR 2, in particular results of relevance to the Gwich'in. Gwich'in Community Liaison will work with the education and distribution of information coming out of the Past Nunavik cohort study. Work with the existing structures of the NCP to increase awareness regarding long-range contaminants issues. Furthermore the Gwich'in Community Liaison will bring to the attention of the NCP contaminants issues of relevance to the Gwich'in that can be addressed through the NCP and NWTECC.</p>	
<p>Project Title: Simple language translation of research results in the NCP-NWT</p>	C-3b
<p>Project Leader(s): Chris Heron, Northwest Territory Metis Nation</p>	

Plain Language Summary

We would attempt to bring together the science community and traditional knowledge holders of the region. This would be done in order that the community understands the contaminants issue. If the issues of contaminants are understood by the TK holders/elders, it is hoped that the community as a whole would readily accept the message if they can go and consult with the elders on such issues. The TK holders/elders could then share information on these important issues, with the scientists giving a unique insight from the aboriginal perspective. At the same time the scientists involved could explain the western science approach. For this proposal the Northwest Territory Metis Nation would address the concerns over water issues. As water is a key component of the aboriginal world, this project would enhance the understanding from the aboriginal and science perspective. We would use a project that was completed and pertains to the particular community, and use this as the materials for the elders/scientists discussions.

Project Title:

Communicating and Filling the Gaps of CACAR II

C-3d

Project Leader(s):

Kelly Pennycook, Deh Cho First Nation

Plain Language Summary

In the last five years, there have been several projects and studies that bear relevance to people of the Deh Cho, as many people rely heavily on traditional foods. Highlights of our proposed project include: Continue to develop and communicating “Contaminants in the Deh Cho II, A Summary of CACAR II, Bret Elkin’s NCP, and Northern Water Research Institute;” and address the CACAR II questionnaire produced during community tours to bring the information to the communities and get feedback to identify research priorities in the Deh Cho.

Project Title:

Participation and Understanding

C-3e

Project Leader(s):

Patrick Simon, Akaitcho Territory Government

Plain Language Summary

First, under the title identified as Participation, I would like to continue to participate in the NWTECC as an active member. Continuing to ensure the utilization and partnerships of the Northern Contaminants Program by the Akaitcho Dene First Nations.

Second, under the title identified as Understanding, I would like to continue to build on the understanding/or lack of understanding of the Akaitcho Dene First Nation Members as it relates to the results of all the work/projects/research that the Northern Contaminants Program have funded Within the Akaitcho Territory with the Marlene Evans, of the National Water Research Institute (NWRI) out of Saskatoon, Saskatchewan. What

Marlene and I would like to do is hire and train one Akaitcho Member to go through an internship With the NWRI. They will assist and train him/her on interpreting, developing and presenting all the results the NWRI have on the Akaitcho Territory in terms of Contaminants

<p>Project Title: Putting Public Service Announcements from the second Canadian Arctic Contaminants Assessment Report into K'ahsho Gotine</p>	<p>C-3f</p>
<p>Project Leader(s): Bella T'Selie- Sahtu Dene Council</p>	
<p>Plain Language Summary</p> <p>PSAs were transcribed by Dene Nation for all other languages in the NWT. Kahsho Gotine was missed during the transcriptions within the Sahtu Region. I propose to listen, record and translate the key messages. I will do this by expanding on the terminology in Kahsho Gotine language. These messages will be provided to Dene Nation to include in their CD. It will also be played on the air.</p>	