TERRA BOREALIS

TRADITIONAL AND WESTERN SCIENTIFIC ENVIRONMENTAL KNOWLEDGE

INSTITUTE FOR ENVIRONMENTAL
MONITORING AND RESEARCH

N°1

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WORKSHOP PROCEEDINGS

NORTHWEST RIVER, LABRADOR
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EDITED BY MICHELINE MANSEAU

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PREFACE

Consistent with the mandate of the Institute for Environmental Monitoring and Research, and pursuant to the Institute's strategy to foster the inclusion of aboriginal environmental knowledge in it's research activities, the Board of Directors requested that a workshop on traditional and western scientific knowledge be organized.Members of the Board of Directors (or their delegates) representing the Innu Nation,the Labrador Inuit Association, the Labrador Métis Association, the Mamit Innuat, the Inuit of Nunavik, the Town of Happy Valley-Goose Bay and the 5 Wing Goose Bay formed a working group to direct this initiative.

The objectives of the workshop were to:

- promote understanding and respect of both systems of knowledge by members of the Board of Directors and the Scientific Review Committee of the Institute;
- examine how both systems of knowledge contribute in assessing the potential impact of human activities on the environment, and;
- establish guidelines as to how traditional environmental knowledge could be incorporated into the work of the Institute.

Aboriginal Elders from both the Labrador and Quebec communities and scientific experts from various parts of Canada presented at the workshop. In a first session, speakers presented case studies to introduce the different systems of knowledge.This introduction then led to four sessions whereby, in small groups, the participants were invited to answer a number of questions related to the conduct of the Institute's research program.

This workshop has provided the foundation for building a relationship of trust and information sharing amongst the aboriginal and scientific communities, and the Institute. Follow-up from this conference is essential to utilize any acquired knowledge and to further the Institute's mandate. As an initial step, this workshop has allowed the Institute to begin critical discussion on the development of ethical research guidelines; and to solicit recommendations as to how the different systems of knowledge can be incorporated into the research protocol.

The proceedings of the workshop consist of papers and transcripts that flowed from the presentations as well as summaries of the plenary sessions that concluded the group discussions.This document also presents the comments received from the participants at the end of the workshop as well as a list of their names and addresses. We hope you will enjoy reading these proceedings.

ACKNOWLEDGEMENTS

The Institute for Environmental Monitoring and Research would like to gratefully acknowledge all of those who helped make this workshop a success. Mr. Michael Rossignol Rich of the Sheshatshit Innu Band Council and Mayor Dougald Gillis of the Town of North West River for their support, hospitality, and encouraged participation of community members. Mrs. Donna O'Dell of the North West River Lion's Club, Mrs. Merle Roberts of the Labrador Heritage Society, Mrs. Melinda Baikie of the Town of North West River, Mrs. Beatrice Decker, Ms. Shirley Hamel, Mr. Charlie Sheppard and Ms. Janet Skinner of the Labrador Institute of Northern Studies for their generous supply of equipment and assitance during the workshop. Ms. Lillian Graham of Triple-D-Lite Restaurant, Angela Andrew, and Virginia Andrew of Innu Nation for organizing and preparing wonderful meals with traditional Labrador foods. Mr. David Scaplen of the Labrador Inn for the excellent service provided by the Labrador Inn staff. Mr. Goronwy Price and Mr. Trevor Paine of the Department of Tourism, Culture, and Recreation for allowing the Institute for Environmental Monitoring and Research to host the TEK Workshop at the Interpretation Centre in North West River, Labrador. Finally, to Mr. Leander Baikie and Mr. Reginald Powell for their timely help and expertise.

We give special thanks to Mr. Sam Anderson, Mr. Etienne Andrew, Mr. Greg Nuna, and Mr. J. C Bourque for their hard work and dedication in providing continuous language translation throughout the entire workshop.

Thank you to all of those who spoke at the Workshop and who contributed papers and information for these proceedings and to all members of the organizing committee who voluntarily helped with the workshop, assisted the Elders with their presentations and helped prepare these proceedings.

Above: Participants at the Workshop on Traditional and Western Scientific Environmental Knowledge

PROGRAM FOR THE WORKSHOP

DAY 1

9h00	Welcome to all participants by the Chair of the Institute, Louis LaPierre Introductory invocation on behalf of the Sheshatshit Innu Band Council, Michael Rossignol Rich, and Mayor of North West River, Hon. Dougald Gillis Presentation of objectives, description of program and timetable, information on logistics to all participants by the Executive Director of the Institute, Micheline Manseau
9h30	Introductory presentation The nature of Traditional Environmental Knowledge (TEK) and the Canada wide experience on the practical use of TEK Fikret Berkes
10h10	Coffee break
PART 1	FOUNDATIONS OF THE DIFFERENT SYSTEMS OF KNOWLEDGE
10h25	Session chaired by Daniel Ashini and Louis LaPierre Presentations by the First Nations, Inuit, Métis and Scientists on how different cultures describe the environment and construct their systems of knowledge. Special references were given on the taxonomic, spatial, temporal and social frames of reference. Speakers were invited to present case studies.
10h30	Some particulars of Innu knowledge of animals: The case of the beaver Josephis Mark - Mamit Innuat
10h50	The nature of scientific knowledge Gordon McOuat - Contemporary Studies Program, University of King's College
11h10	Innu environmental knowledge about waterfowl Pien Penashue – Innu Nation
11h30	Naskapi environmental knowledge and its value Joseph Guanish - Naskapi Band of Québec
11h50	Understanding and use of traditional knowledge in policy and decision making for sustainable development Julian Inglis - Consultant in Environment and Development
12h10	Wrap up session facilitated by Daniel Ashini and Louis LaPierre
12h20	Lunch served at the Town Hall, North West River
13h30	Char fisheries in Northern Labrador Amos Maggo - Labrador Inuit Association

13h50	Naturalized knowledge system on the environment as it applies to thanksgiving address Richard David - Department of the Environment, Mohawk Council of Akwesasne
14h10	Taking care of each other – A relationship between Labrador Métis and the environment John Howell - Labrador Métis Association
14h30	Nunavik Inuit perspective on traditional knowledge Mark Annanack - Inuit of Nunavik
14h50	Development of a land use and ecological database for Nunavik and its application to management and other wildlife issues Bill Kemp - Environmental consultant with the Makivik Corporation
15h10	Wrap up session facilitated by Daniel Ashini and Louis LaPierre
15h30	Coffee break
PART 2	HOW WOULD DIFFERENT WAYS OF KNOWING CONTRIBUTE IN ASSESSING THE EFFECTS OF HUMAN-RELATED ACTIVITIES ON THE ENVIRONMENT?
15h50	Session facilitated by John Mameamskum and George Finney Introductory presentation by Fikret Berkes Participants break in 4 groups to discuss the question(s). A facilitator was chosen in each group to report in the plenary session Plenary session chaired by John Mameamskum and George Finney Discussion, conclusions and recommendations on part 2
17h30	Supper served at the Town Hall, North West River
PART 3	SIMILARITIES AND DIFFERENCES BETWEEN DIFFERENT SYSTEMS OF KNOWLEDGE
19h30	Open discussion on the topic facilitated by Tim McNeill and Jim Schaefer

DAY 2

PART 4	HOW CAN BOTH SYSTEMS OF KNOWLEDGE BE USED IN THE RESEARCH PROJECTS OF THE INSTITUTE?
8h45	Session facilitated by Louis LaPierre and Guy Bellefleur
8h50	Contribution of different systems of knowledge Daniel Ashini - Innu Nation
9h10	Perspectives on the potential contributions of Innu environmental knowledge in the research projects of the Institute Gabriel Wapistan - Mamit Innuat
9h30	Inclusion of different knowledge systems in research Fred Roots - Member of the Scientific Review Committee of the Institute
10h00	Coffee break
10h15	Introductory presentation to the group discussions by Jean Huot
10h25	Participants break in 4 groups to discuss the question(s). A facilitator is chosen in each group to report in the plenary session Plenary session chaired by Louis LaPierre and Guy Bellefleur Discussion, conclusions and recommendations on part 4
12h00	Lunch served at the Town Hall, North West River
PART 5	WHAT SHOULD BE INCLUDED IN THE ETHICAL GUIDELINES OF THE INSTITUTE REGARDING THE RESEARCH OBJECTIVES, METHODS, FINDINGS AND THEIR INTERPRETATION, AND PUBLICATION?
13h30	Session facilitated by Todd Russell and Gerry Parker
13h35	Introductory presentation by Julian Inglis Participants break in 4 groups to discuss the question(s). A facilitator is chosen in each group to report in the plenary session Plenary session chaired by Todd Russell and Gerry Parker Discussion, conclusions and recommendations on part 5
15h15	Coffee Break
15h30	Wrap-up session by Louis LaPierre

Fikret Berkes
University of Manitoba

The Nature of Traditional Ecological Knowledge and the Canada-wide Experience

I would like to talk about (a) the nature of traditional ecological knowledge (TEK) from work done across Canada, (b) different kinds or different aspects of TEK, and (c) the difficulties in researching and using TEK — what outsiders as researchers can and cannot do in relation to aboriginal communities. I base my comments on TEK-related work as I have experienced over some 20 years in Manitoba, Ontario, Quebec, NWT and British Columbia. My views do not represent all natural or social scientists, and certainly not TEK-holders. The only real experts in TEK are aboriginal people who practice it.

What is TEK? The Constitution of the Institute for Environmental Monitoring and Research defines "aboriginal environmental knowledge" as a body of knowledge built up by a group of people, through generations of living in close contact with nature. The working definition I have used for TEK is a cumulative body of knowledge, practice and belief, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment. These are dry definitions compared to what aboriginal people themselves have to say about TEK. For example, when the participants in a 1995 conference in Inuvik, NWT, were asked to describe traditional knowledge, there was consensus on the following meanings: practical common sense; teachings and experience passed through generations; knowing the country; rooted in spiritual health; a way of life; an authority system of rules for resource use; respect; obligation to share; wisdom in using knowledge; using heart and head together.

It is clear from this that TEK has many meanings and many faces. Several authors have noted that traditional knowledge may be considered at several levels of analysis, consistent with the description of traditional ecological knowledge as a knowledge-practice-belief complex. In my view, there are at least three different elements in TEK. (Note, however, that this is an outsider's analysis; many aboriginal people do not see separate elements in TEK.)

First, there is the local knowledge of animals, plants, soils and landscape. This level includes knowledge of species identifications and taxonomy, life histories, distributions, and behaviour. Based on empirical observations, all such knowledge has obvious survival value. This is the level of knowledge in which biologists and hunters have a great deal in common. For example, Western scientists often admire and appreciate the detailed knowledge of caribou that hunters hold — their habits, their food, movements and where to find them.

At the second level of analysis, there is a resource management system, one which uses local environmental knowledge and also includes an appropriate set of practices, tools and techniques. An appropriate set of ecological practices requires an understanding of ecological processes, such as the functional relationships among key species and an understanding of forest succession. A traditional system of management also requires appropriate social institutions, sets of rules-in-use and codes of social relationships. At this level, practices and rules of traditional hunters differ considerably from those of scientists.

For example, the James Bay (Quebec) Cree caribou hunters' resource management system is based on field observations similar to the scientists' management system.But the Cree do not believe in counting or tagging the caribou as scientists do. The Cree traditional management system does not use a quantitative model. But it does look at population trends (whether the caribou are increasing or not), the behaviour of caribou, and the fatness of caribou. The fat content is, in fact, a very sensitive index because it says something about how healthy the environment of the caribou is. It seems to be used by such diverse groups as the Quebec Inuit, NWT Dene and the Alaska Inupiat. By the use of such indicators, traditional caribou hunters can construct qualitative models which allows them to monitor and manage the caribou.

At the third level of analysis is the world view which shapes environmental perception and gives meaning to observations of the environment. It has been referred to as "paradigmatic knowledge" or the ways of conceiving the universe. The concepts supplied by our conceptual order, the world view, invariably supply the interpretation of our observations of the world around us. This level includes religion, ethics and, more generally, belief systems, and rounds out the knowledge-practice-belief complex that describes traditional knowledge.

Western scientists have trouble with the notion of belief and spirituality as part of a knowledge system. Beliefs are thought to have no role to play in scientific knowledge, although there are often implicit beliefs in the practice of Western science as well. For example, conventional Western science (but certainly not all science) believes that nature can, and should be, controlled, and that nature is best described as lifeless and mechanical. These beliefs go back about four centuries in Western thought to Newton and Descartes who argued (and believed) that there was a clear split, a dichotomy, between mind/body, observer/observed, and humans/nature. By contrast, many traditional peoples worldwide do not see such dichotomies. They hold the opposite belief that nature cannot, and should not,be controlled,and that nature is alive and full of life forces. More and more Westerners, including scientists and especially ecologists, are coming around to a position similar to that of traditional peoples. At the very least, many are beginning to respect traditional peoples who think differently about the natural world.

These differences are at the root of the difficulties in researching and using TEK by outsiders. But they are also at the root of the great potential in using TEK and Western science together. Although we do not have the time to go into details, there are many examples of the use of TEK and science together to improve resource management and environmental assessment. Often the two kinds of knowledge complement one another. For example, in some cases, TEK can produce a time-series of information to establish a baseline and help make sense of scientific findings. As a TEK researcher, what can an outsider do and cannot do?

An outsider should not expect to extract useful bits of knowledge from a hunter or elder because such local knowledge is part of a larger system of knowledge, practice and belief. He or she cannot, for example, go to an elder and ask, "Tell me all you know about caribou." There are at least two important reasons why such a question cannot be asked.

First, to ask about caribou meaningfully, the researcher needs to know the elder's practices, rules,customs, beliefs and concepts. For example, the Dogrib Dene term ndè is usually translated as "land." But its meaning is closer to "ecosystem," except that ndè is based on the idea that everything in the environment has life and spirit. Without a knowledge of the concept, a researcher cannot very well ask questions about the animals that inhabit this live-ecosystem.

Second, there is the issue of intellectual property rights. Gone are the days when a researcher can visit a community, ask some questions and quietly disappear to write some papers, government reports or a thesis. The reality of the 1990s is that aboriginal communities can and do ask for accountability, and for the researcher to address the community's concerns and priorities.

So what can Western scientists and resource managers do with TEK, and what kinds of things can they ask? Based on Canada-wide experience, here are a few conclusions and suggestions:

1. A research and monitoring program may consist of both TEK and scientific research. In TEK research, aboriginal people will decide what is important. They will set the agenda for TEK research and application. The TEK research has to be coordinated with science towards a common goal — that of monitoring to keep the environment healthy. Scientists thus become partners in a reciprocal relationship and should be prepared to be responsive and accountable.
2. Some kinds of TEK information are more sensitive than others. The communities need to control certain kinds of information as their "intellectual property" within a general framework of reciprocity and sharing. Obviously, information important for environmental monitoring needs to be shared to address objectives which are established jointly. Just how the information, and what kind of information, is to be shared can be decided upon beforehand by means of a protocol.
3. The belief component of TEK is usually important for aboriginal peoples. It cannot be ignored. Beliefs and customs are culturally important as well. Western scientists do not have to believe in them, but they have to learn to respect them.
4. Using TEK and Western science together has a great deal of potential. This potential is just beginning to be used across the Canadian North, from Labrador to the NWT. The two can be practised separately but in partnership. That is, both kinds of research should be carried out under their own terms of reference and by people who are experts in each. This would preserve the integrity of each, and set the stage whereby complementary information produced by each can be combined to carry out the overall objective to monitor for a healthy environment.

Josephis Mark
First Nations of Mamit Innuat
(Transcribed by András Mák)

Some Particulars of Innu Knowledge of Animals: The Case of the Beaver

Now I will talk. I am 74 years old; 74 already. I lived in the forest. I did not live in the white world; I lived in the forest. There, hunting is a way of life. What was understood about animals was not written down. We did not use writing. There is someone for the animals. For a long time, the Innu have said, from generation to generation, that there were Innu who lived with the animals. That is how we learned and used the stories. The master of the caribou and the man who lived with the beaver, they were said to exist. That is how we lived. We paid attention to the bones of the beaver and the caribou. We hung them up or put them in water. That is what we did.

It is said that there is an Innu who lives with the beaver and watches over him. That is how the Innu learned what he knows. All the animals have someone with them, and from generation to generation, our grandfathers and our fathers told us what they did. There is nothing written down about what we did.

It is not just us, the Innu, who are like that. I believe that all Natives have the same stories. The Innu have been telling these stories for a long time. That is all.

Also, you know the caribou. It is said that there was an Innu who lived with the caribou, too. All the animals had someone who lived with them. The bear, you know the bear! He is very intelligent. He is like a human being. I am talking about the black bear. The caribou is very intelligent as well because it is said that someone watches over him.

I cannot know everything. The Innu have existed for a long time, and these stories were already in existence.

The Innu used many things, such as drums and shaking tents, when they were out on the land. With the shaking tent, we could find out if there would be an abundance of food. Those in the shaking tent speak with one another, and they can tell the hunter whether there will be a good hunt. That is our way. Thinking, for us, is like writing.

That is how we learn. But today, today, there are non-natives around. My children are no longer the same. They have adapted to the non-native lifestyle.

Also, the beaver, we know the beaver. For example, a very young beaver is called AUETISK. After a year, he is called UPUEUISK. He still lives with his mother. After three years, he is called PATAMISK, and he lives alone.

How did the beaver build dams like those people who build hydroelectric dams on our rivers? How does the beaver figure out how much food he needs to get through the year (winter)?

After 10 years, the beaver has no young. During the last mating, there will be just one.

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Before, the elders were the repositories of all the knowledge. They passed it on to us like that, it was like a legend. That is how we learned. Today, we no longer have that to tell to the young people.

The burrows. The beaver also has his burrows under the water. He makes burrows even though he has a lodge because the man-beaver told him to make them to avoid Innu traps. If there was no man-beaver, the beaver would surely have no burrows around his lodge.

That is all I have to say.

Gordon McOuat
History and Philosophy of Science,
Contemporary Studies Program,
University of King's College

What is Western Science?

We are faced with a fairly daunting task: to sum up the nature of "science" in such a short space. We students of science have been trying it for almost 200 years with only moderate success. To make it a little easier, I wish to divide this paper into three parts: The first will be concerned with some received definitions and fundamental characteristics of Western Science, distinguishing it from other forms of knowledge. The second will quickly identify some problems with those definitions. The third will introduce some attempts to understand science as a cultural phenomena in contact and dialogue with other cultural phenomena.

SOME DEFINITIONS

The term "science" itself has its history and has come to stand for, in its original meaning, a body of organised, systematic, knowledge. However, this definition will not do, for it fails to mark off science in the modern sense from other organised, systematic, knowledge, much of which we would not recognise as wholly "scientific." We have come to recognise modern science as knowledge of a certain kind, with a certain method. That method brings with it a certain approach to problems and questions. While it is somewhat difficult to attempt an all encompassing definition of science, we would do well to flag a few keywords — characteristics which supposedly separate science from other belief systems, other cultures. I list them here as an intuitive start to our understanding of science as a particular belief system, a particular approach to knowledge.

1. *Objectivity* — Science in the modern sense aims at the squeezing out of subjective interests. Scientists are certainly human and come with their own particularities, wants and needs. But as scientists these particularities are to be put to the side. The determining factor in science is, then, the "object," the need to speak plainly and directly about the object. And this object, supposedly, exists independently of the wants and beliefs of the scientist. This notion of an independent object has been called the "view from nowhere." That is to say, science avoids any privilege perspective. Perspectives come from the *application* and interpretation of scientific findings. Once science leaves its pure encounter with the object, then it gains perspective.
2. *Concern with facts and data* — Facts, upon which science is to be grounded, are not to be associated with subjective interests. Science is the accumulation of data about the world. In that sense, science has its own particular language — straightforward and concerned with facts.
3. *Unconcern with "why" questions* — With that separation comes a distance from wider questions of "ends" and uses. Science, it is said, is uncon-

cerned with "why" questions and concentrates on the "how." Science cannot tell us why we should do something, only "how" we could do it. In this sense, science is held to be "amoral" (not "immoral"), unconcerned with ethics. Science thus is separated from politics and aesthetics and traditional beliefs. These enter the picture from elsewhere.

4. *Analyticity* — To get at these "how" questions, science is "analytic." That is to say, science breaks up larger objects and questions into smaller, manageable questions which can be analysed. Science breaks problems into reducible parts.
5. *Language* — The language of those parts is often couched in terms of measurement and mathematics. Science is often, although not always, spoken in the language of mathematics and number, abstract mathematics and measurements. No metaphorical, poetic language.
6. *Rationality* — Now, along with its analyticity and specialised language, science has come to stand for a particular kind of rationality, if not "rationality"itself. To be rational, it is said, is to be scientific, analytical, objective in just the sense science gives to these terms. To be rational is to follow the "scientific method."
7. *Scientific method* — Now, there are various versions about what we mean by "scientific method." In the popular conception, the scientific method is just concerned with the unbiased gathering of facts as mentioned in the first three sections above. This, however,just won't do. Numerous,indefinite and possibly infinite number of facts can be gathered on any one object, not all of which are of equal importance.If science was just "fact-gathering" it would soon bog down in all the detail. Rather, data collection and analyticity is always based on a set of questions about the object. Scientists present a "hypothesis" based around a structure of scientific laws. The laws state something like,"if this occurs, then, necessarily, that will occur." The scientist, then, sets out to test those hypotheses in the light of what can be known about an object. Science, then, is a constant testing of hypotheses by data collection and experiment. Experiment is the controlled use of analyticity in the light of scientific laws.

   Now, it does not really matter where the hypotheses come from (traditional beliefs, good guesses, and so on). As long as they are put in testable form,then they can be said to be subject to the scientific method.
8. And in that sense, science is often seen as wholly caustic to traditional beliefs and cultures, like some sort of universal acid, which can cut through and test all forms of knowledge-claims. In that sense, science is seen as the best form of *critical thinking,* in a state of "perpetual revolution," always questioning fundamental beliefs.
9. Along with this notion of test and critical thinking comes a particular attitude towards *Nature*. Nature (in scientific ways of knowing it) is thought to be subject to control. That's how we know it. Control and reduction are at the very core of experiment and hypothesis testing. Along with the notion of control comes the notion of "optimisation." Using the experimental method of hypothesis testing, we can, theoretically, discover the best way to get "results" from nature based on the kinds of questions we ask of it.In this sense, science is often seen as both complimentary and hostile to traditional means of knowledge."Complimentary," insofar as science could, theoretically, produce the best results for the kinds of uses traditional com-

munities might require of nature. "Hostile," insofar as this version of science sees our only knowledge of nature through notions of control and measurement.

SOME PROBLEMS AND CAUTIONS

Now, I said that I want to flag all these characteristics. Some of you may nod in agreement right here. This seems, for all its lack of refinement, to describe what we agree science is all about. But, we should be careful about trying to describe such a complex entity as modern science by such a descriptive set of almost necessary properties. The closer we study it, the more we begin to see that this "received" notion is not so tight. It leaks here and there.

This questioning of these fundamental characteristics began about twenty years ago when we began to look at the cornerstone of scientific method — hypothesis testing. Hypothesis testing faces one big problem to begin with. Where do these hypotheses come from? Hypothesis gives us the problem sets, the very meaning of data, but it is difficult to delineate a strict "scientific method" to come up with hypotheses. Hypotheses are, to use one commentator, the moment of "creative intuition." As far as science goes, hypothesis *could* come from anywhere. It is not the job of science to decide where those hypotheses come from. Hypotheses set the type of questions to be asked about Nature. But, right away we had a problem. If hypothesis set out the sets of questions, then we were already narrowing the field to those questioned legitimated by our hypotheses. Were we missing something?

Such questions began with the justifiably famous,albeit controversial, work by Thomas Kuhn, *The Structure of Scientific Revolutions*. Kuhn, author of several influential works on the foundations of physics and cosmology, noticed that scientists never really questioned deeply their fundamental assumptions. Rather, they seemed to work enclosed within certain models,certain ways of proceeding, grounded on the skills and conjectures given to them in their scientific training. (This seemed to stand to reason. Scientists cannot question all of their assumptions all of the time. That would be wholly impossible.)

But Kuhn went one step further. Since hypotheses provided the set of legitimate questions to be asked by scientists, the move from one set of fundamental beliefs to another set was never grounded on the received canons of scientific reason. Rather, some scientists defended the older theories with gusto whilst newer, younger scientists would defend a new set of assumptions with equal vehemence.

The leap from one set of assumptions to another was often, in Kuhn's words, a "leap of faith." (Kuhn was far too hasty here. The notion of "faith" is much deeper than that. Rather, Kuhn wanted to point out that this shift of assumptions about the world was grounded on more that just pure scientific method.) Consequently, there is something "communal"about the set of questions asked of Nature. Science is as much a "culture," in the anthropological sense,as it was a method.

None of this was meant to question the rationality of science or the power of its method. Rather, Kuhn and subsequent historians of science wanted to question the set of assumptions given in part I of this paper as being fully descripting of the nature of science. Here is a modified set as presented by recent studies of the methodology of science:

1. *Objectivity* — Science is inescapably grounded in the perspective of the scientist and his/her community. In a sense, science is intimately culturally grounded. This does not mean that science is not "objective" or that it does not aim at truth. It just means that the subject, the community, is much more intimately related to that object than previously thought.
2. *Facts and data* — are determined, delineated by the theory, the hypothesis, the types of questions presented by the theory. Science's concern with data is commendable, but that date is circumscribed by the sets of questions asked by scientists.

3. *Unconcern with "why" questions* — Science, as a culture, is, in an often roundabout way, very deeply concerned with ethics, politics, and so on. Actual scientific practice is very much influenced by concerns outside science.
4. *Analyticity* — Scientists cannot get rid of metaphor and the contingencies of language insofar as scientists must rely on metaphorical language to catch any meaning of their terms, to explain their results, to be part of their language community. Moreover, science is very much grounded on "tacit" knowledge, acquired by years of skill acquisition and training in a way of life.
5. *Scientific method* — is not a particular, single thing but a collection of methods and practices located in different knowledge centres, different ways of approaching the object.

FROM METHODS TO ENCOUNTERS AND NEGOTIATIONS

Now we can reformulate our original set of characters, our original separation of two types of knowledge whilst mitigating sceptical views about science *and* notions that it is *the only* approach to knowledge. We can now see science as localised knowledge — originating, for example, in the practices of laboratories and statistical surveys — in encounter with *other*, different types, of situated knowledge.

And that is why we are participating in such workshops, such encounters.

Science,indeed, has its *method* — or more correctly, its *methods*. It acquires its incredible knowledge and successes through years of practice, years of training, bringing larger questions down to local size and giving it meaning. In our all-to-hasty move to see science as *merely* the "view from nowhere," we forget about its encounter — as historically located encounter — with other forms of knowledge. Other forms which may have different ways to legitimise those local practices.

Pien and Lizette Penashue
Innu Nation
(Translated by Daniel Ashini and transcribed by Peter Armitage)

Innu Environmental Knowledge

Pien/Daniel: Pien started off by saying that the knowledge that he is going to share with us today is not knowledge that only he and his wife only know about. There are other elders that are present here today that know about this knowledge of different plants and trees. It is common knowledge among the elders, and [is] knowledge that has been passed on from generation to generation.

The first type of medicine that he would like to talk to you about is one that comes from young juniper trees. It is usually the young juniper tree that he tries to make medicine out of. The medicine he makes out of the young juniper tree is this type of medication; it is boiled, and a fluid mixture is made out of it. This is used for coughs or it can be used for other purposes as well; the juniper he says also has other different uses. If you scrape the outside bark, the inner side of the bark, the white stuff, that also has a purpose. It can be used for infections or cuts or on an abrasion that happens in the country.

Pien/Daniel: The other medicine that Pien is talking about is this type of medicine, he said it looks like "Tang," but it is not "Tang." It is made from the spruce boughs that are gathered from the land. The purpose of this medicine is to serve when it is sort of hot. People sip it, to get rid of colds or shivers that people have in the winter time. That is the purpose of that medicine. The medicine that he is talking about here is general knowledge of all elders, whether they are from St. Augustin, La Romaine, Natashquan, Mingan or Sheshatshit or Davis Inlet. It is still commonly used in the country. This was more commonly used by the Innu people before hospitals or European contact, or in the early parts of European contact when people didn't have to go to the coast for the treatment of illnesses.

Lizette/Daniel: The other medication that Lizette here is talking about is some kind of powder made out of dead trees, rotten trees. She says that it is scattered from the forest and it is used...she says that she has often seen babies and young children have rashes, diaper rashes or rashes on their bodies. Quite often mothers have used baby powder on them and she has found out that they actually quite often didn't work on the babies. So Lizette prefers to use sort of powder on rashes for babies and young children.

Lizette/Daniel: The other type of tree that is used for making Innu medicine is the fir tree. You can see here there is turpentine, there [are] bubbles on the fir tree. The Innu people have many different uses for that turpentine. Innu people use it for making fluids of medication for different sorts of illnesses. They use it for cuts, [and as] medication for expecting mothers after they have delivered the baby. Lizette tells me that they usually have some complications and have a hard time getting well again, as you normally would, but that is used for those types of situations as well.

Pien/Daniel: Pien said they just brought the fir tree, they didn't have time to make the

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medication out of it. He just wanted people to see where the medication comes from. It actually comes from the tree. He has used that tree quite often, and many, many people from the country still continue to use it.

Lizette/Daniel: For example, Lizette says for people [with] diarrhea, for example there is medication in the fir tree,in the turpentine. You burst the bubble from the tree and the fluid comes into a container and you make that into a fluid and the person drinks it for diarrhea.

Lizette/Daniel: Can anyone tell them what this in? Laughter ("We call it 'beaver pride'" — member of the audience). These are the testicles of a beaver. This is another thing that Pien is talking about. This comes from the beaver. There is a lot of medicine in this, and a lot of Innu people are dependent on this for their well-being, for being cured of many diseases, infections, cuts. Not only the lower part is used but the upper part as well.

Pien/Daniel:Quite often the trappers,the Settler trappers as well, came to the Innu and asked them for some bait for their traps. This is excellent bait for trapping that Innu people have used. The beaver is not only used for medication.The beaver, when it is harvested, is used for food; it is used for its fur. All the Innu from the Lower Quebec North Shore, the elders that are here, can attest to this.

Lizette/Daniel: Lizette also showed me something here that she brought along. This is for children, young children who have runny ears, pus coming out of the ears and ear infections, and so forth. The thing that Pien showed us, the testicles of a beaver, the fluid is applied onto a cloth and wrapped around the ears of children so to cure the infection of the ear. This has helped and cured many children in the past.

Pien/Daniel: Pien said that him and his wife had to help out with an infected boy and a young child a couple of days ago. Apparently the child went to the hospital, to the clinic here. He had gone to the clinic over and over again. Apparently the medication that he was given, the penicillin and so forth didn't help at all. So Pien and his wife used the knowledge and the medicines that they had been brought up to learn about and make themselves from the land were applied to the boil. The child came back to them after a day or so and was very nice, and said I'm very happy that I can came to you, and the boil was gone. The infection was gone.Actually Pien is saying that he is not only a doctor and his wife a doctor, he also has tried to become a surgeon as well.He actually operated on two adults. Not on the inside parts of the body but on the outside where people were infected, had cuts or boils that were infected, that he had to do something with. He has done that on two occasions. He said that you have heard of his way of healing involving medicine.

He is not trying to say that he is not a believer in God. He is a very strong believer in God,he prays quite often and goes to church. So there [are] two sides to his healing. There [are] the things that he gets from the forest, and the prayer that he uses. He prays during the healing process.

He said that you quite often hear about the Innu people strongly opposing developments, industrial developments. You quite often hear about the Innu people protesting, blockading and so forth.He said these are the very reasons why Innu people protest industrial developments. Innu people want to protect their medicine. Innu people want to protect their wildlife, their land and their environment that has protected them over the years. The wealth of knowledge that he has been able to gain over his life-time didn't just come out of thin air; it was passed on from his parents, his parents learned it from his grandparents, and so forth.

Lizette/Daniel: Lizette adds that they didn't spend their time sitting in front of a classroom, in front of a teacher, at a desk in school. They learned by doing, they learned by watching, they learned by being on the land with their parents. Their professor didn't get paid, their teacher didn't get paid, they didn't get student allowances; they learned from having to survive on the land. Lizette said the medicine that they have shown us here, actually some people have already asked for the medicine that they have shown us yesterday, one of her...daughters' daughters is apparently having some rash, and she wanted the medication...to treat her baby. Even the other cough medicine and the other fluids that she has here for medication. She said that you have to be careful of these types of medicine. Some of the medication here is too strong for young children or babies. There is medication here that is good for both younger people and older people. But in terms of the medication from the tree,the fir tree, you have to be careful about the size and the age of the tree for the patient. You have to use a younger and smaller tree, fir tree, for developing medicine for young babies, because the medicine from older and bigger trees is too strong for the young babies.

Pien/Daniel: Pien says that what you see here is a very, very small part of Innu medicines that are available that are made from the land. It is a very tiny part. The types of medication, the types of plants and trees and so forth that Innu people use for medication are many, many, many; that it may take twenty years...and we only have a short period of time to talk to you, to talk about a tiny part of the Innu medicine that we use. It may take twenty years for people to learn the types of medicines that we use or it may take longer than twenty years.

Even when they were in the country, Pien said one of the non-Innu nurses that works at the clinic here, used to work at the clinic here, went in the country with them. She was actually a registered nurse, and one of her children become ill and she couldn't do anything for her in terms of the types of medication that she had. Nothing seemed to help the child so she brought the child to them, and they were able to provide medicine that was required to help heal the child that was sick. The nurse told them that, that type of medicine works wonders. It is amazing.

Daniel: I would like to thank Pien and Lizette for taking the time to show us a little bit about their secrets and their knowledge, I think it is very important.

Pien/Daniel: Now he is going to go into the market he said.

Joseph Guanish
Naskapi Band of Québec

Naskapi Environmental Knowledge and its Value

I come today to talk to you about the knowledge of my people, the Naskapis, and how it can be useful to improve the understanding of all Canadians and Quebecois of the environment and of how to act as its servant and custodians to its and our long-term benefit.

We are some 680 Naskapis. The vast majority of us now live in Kawawachikamach, where we settled in the early 1980s. Our ancestors and we have occupied the interior of the Quebec-Labrador Peninsula since time immemorial. We traditionally led a nomadic existence, following the caribou herds from Hudson Bay in the west to the Labrador coast in the east.

We signed a comprehensive land-claims settlement, the Northeastern Quebec Agreement, with the governments of Quebec and Canada, among others, in 1978. Among the rights and benefits recognised by the agreement is the right to hunt, fish, and trap virtually without restriction throughout a defined area. Harvesting activities remain at the core of our economic and cultural life. Virtually all members of our community hunt, fish, and trap, and many of us continue to depend upon the harvesting of wildlife, particularly caribou, to sustain ourselves and our families.

Our knowledge is the product of observations of the environment over thousands of years and of the sharing of those observations, shaped by our beliefs, values, and customs. Indeed, the teachings of our elders are based on respecting the creator, who left for us food from the earth to survive. Many of our elders' teachings deal with survival in the bush. There are also teachings for delivering babies, child rearing, and many other things. Both men and women are taught the same things.

The elders' wisdom was transmitted to me through my grandfather's teachings. As my father passed away at a young age, my grandfather taught me how to survive in the bush by hunting, fishing, and trapping. And I have since helped to keep our Naskapi way of life alive by teaching our young. I teach them our skills and our culture and traditions, so that they are able to live safely in the bush and to feel the joy of being there.

Our people traditionally travelled considerable distances, venturing to the Labrador coast, Hudson and James Bays, Ungava Bay, and the north shore of the St. Lawrence. This was necessary to pursue either nomadic wildlife that seldom showed themselves to hunters, or more abundant wildlife populations in other areas. In order to pursue effectively wildlife in faraway places, especially when experiencing a shortage of food or other materials, our hunting groups had to be knowledgeable of the larger environment beyond their immediate surroundings. Hunting groups therefore exchanged knowledge. Because of the exchange of environmental knowledge, hunting territories, and even hunting-group members, the environmental knowledge of our people covers a vast area, essentially the whole of what you call the Quebec-Labrador Peninsula.

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Knowing the environment can be a matter of life and death for us. A wrong move on the river ice can send a man to his death. We therefore study environmental factors like the winds and currents. Also, my grandfather taught me how to know when it was about to be very windy, or if a storm was rising, and how not to try to return to camp during a blizzard of high winds. Instead we were taught to find a safe place to dig in the snow, and to use a hollow stick to help with breathing.

My grandfather also taught me certain techniques and how to use tools like sticks and axes. With the stick, we could push away sharply pointed pieces of ice, which could damage canvas canoes, perhaps causing us to drown.Also, we would keep a certain distance between us when walking along the shore. If one fell through the ice, the other could use the axe as an anchor for support while offering the long stick to the person in the water.

We also study animal behaviour. The caribou are vital to our livelihood. Many times our people have survived because of the caribou. We therefore know the caribou well. We know how they travel, at what times of the year they travel, and where. By watching them and tasting their flesh, we know if they are in good condition or not.

Our knowledge is acquired through direct experience, in the immediate context of daily living. We live close to nature,through all seasons. We are therefore swift to detect very minor changes in the environment, in such things as vitality, quality, and odour, before they are known to government enforcement agencies or scientists. Our knowledge of the environment is intimate. Scientists are more removed from the environment. They compile the results of periodic surveys and conduct sampling over large areas.

Aboriginal and western knowledge systems have different philosophies. Western science is empirical,mechanistic, and analytical. Scientists rely on the replication of results for validation, and on the testing of hypotheses to generate theories and laws. For us, single observations are just as important as recurrent ones, and they are added to our body of knowledge. We perceive the world as a flux of interacting cycles. Our observations are organised informally and do not determine which subsequent observations are to be made.

In other words, aboriginal knowledge is holistic, whereas western science tends to be reductionist. The aboriginal explanation of environmental phenomena is very ecological, in that it considers all the interconnections, incorporating the human, natural, and spiritual worlds. The spiritual world is important to us. We accord the same degree of respect to nature and animals as to humans, as we all share the same creator. That is why we were taught to use every part of the caribou and the other animals that we killed, in sign of respect for the animals' offering themselves to us.

Our people have survived in a sub-arctic environment and have been the land's stewards for millennia. The survival of our people and of the trees, rivers, fish,birds, and caribou testifies to the value of our knowledge and its application to management practices. We could not have survived if we had not heeded the teachings of our elders.

After half a century of intensive European contact on this land, the unrelenting pace of resource exploitation and development threatens our environment. Aboriginal knowledge is essential for our mutual survival.It is a body of knowledge that encompasses an experience of more than 5000 years. It is holistic. And it is embedded in respect for creation.

Benefits can be derived by using both systems of knowledge. Our knowledge should not be confined to a secondary role, used merely to validate scientific data, but given equal standing.I look forward to our co-operation as equals.

Thank you.

Julian Inglis
Consultant in Environment and Development

Understanding the Use of Traditional Knowledge in Policy and Decision Making

This workshop is significant for two reasons. It is especially important for the Institute as it seeks practical and effective ways to use traditional and western scientific environmental knowledge in its work. It is also an important contribution to policy and decision making at the international level. What does the knowledge, skills, and experience of First Nations, Inuit and Métis in Labrador have to do with the global environmental agenda? Two examples from forestry and fisheries underscore the importance of community participation in the global management of resources.

A recent report (*The Last Frontier Forests: Ecosystems and Economies on the Edge*) concludes that almost half of Earth's original forest cover (3 billion ha) is gone. Much of it was destroyed within the past three decades. We lose 16 million ha per year. Just 20% of the world's original forest cover remains in large tracts of relatively undisturbed forest. Most of this forest is found in frontier areas of Canada, Russia and Brazil. Canada is one of the very few countries in the world with the opportunity to keep most of its original forests and to use them in a sustainable fashion. Relatively little scientific information is available, and that holds true for our boreal forests in Canada. Yet these forests have been home to Aboriginal people for several thousand years. The report acknowledges the significance of traditional knowledge and the key role that Aboriginal peoples should play if these forests are to be managed in a sustainable fashion. The sorry state of the Atlantic cod fishery is well known. The Department of Fisheries and Oceans recently acknowledged that scientists had not listened to local fishermen, and perhaps they should. There are similar stories from around the world, and it is reported that 70% of all fish stocks are in trouble. A workshop in S. E. Asia, the centre of global marine biodiversity, concluded recently that, "Community-based coastal resources management efforts should not be romanticised, — but in the south-east Asian context, there is no realistic alternative but to enlist and empower communities to serve as front line in the struggle for marine biodiversity conservation and the sustainable use of marine resources." (*Conservation and Sustainable Use of Coastal and Marine Biological Diversity – The Way Forward. A View from S.E. Asia*. Recommendations from the Southeast Asia Regional Workshop on Marine Biodiversity and the Convention on Biological Diversity. October 24-25, 1996. Subic Bay, The Philippines.)

Here are two examples, from forestry and fisheries, where there is an acknowledgement, from resource managers and specialists at the international level, that indigenous and local peoples have a critical role to play in ensuring the sustainability of the resources on which we all depend. But for this to happen, traditional knowledge must first be understood and incorporated in policy and decision making. What has been the experience to date?

Interest in traditional knowledge, under a wide variety of names goes back many years. That interest was largely academic with some exceptions, such as Indigenous peoples knowledge and use of plants, animals, and minerals for medicinal purposes. The Brundtland Commission (UN World Commission on Environment and Development, 1987) generated international interest, while public attention in the subject was captured in a cover article in *Time* magazine (September 23, 1991). The three-year process leading up to the Earth Summit in Rio de Janeiro (UNCED: UN Conference on Environment and Development, June 1992) though was probably the single most important contribution to the recognition and use of the traditional knowledge in policy and decision making. This intergovernmental process gave indigenous peoples the opportunity to tell their stories, in their own words and in their own ways. Their stories and dialogue had a profound impact on many of the participants at these high level discussions, as the results show. All of the documents produced in Rio reflect the need to recognise and use traditional knowledge. They include the Convention on Biodiversity, Forest Principles, Agenda 21 and the Rio Declaration. Canada is active in the follow up and implementation of these agreements and supports Aboriginal participation. For example, a special session on implementation of Article 8j of the Biodiversity Convention is being held in Madrid in November 1997. (Article 8j states that each contracting party shall: "Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from such knowledge, innovations and practices"). Canada has also been at the forefront of efforts to secure Global Forest Convention. The Intergovernmental Panel of Forests has made "traditional forest related knowledge" a high priority in its work. The Canadian government provided support to the National Aboriginal Forestry Association to prepare a position paper for the Panel, based on case studies and experience from across the country, and to participate in discussions with the Indigenous peoples from other parts of the world. These international agreements set the stage for action at the national and regional level as governments move towards implementation. Some governments have moved quickly. For example, the Government of the Northwest Territories has introduced a policy on traditional knowledge to ensure that it will be incorporated in to the government decisions and actions where appropriate. (Northwest Territories Policy 51.06). The policy applies to all departments, agencies and employees of the Government. On the national level, the environmental assessment process recognises the importance of incorporating traditional knowledge. The Canadian Forest Service has entered into partnerships with First Nations as part of its Model Forest program. There are many examples at all levels of government.

But there is much to be done, however, to translate wide support for community participation, and broad statements of policy, into action at the local level. Indigenous peoples around the world have made significant gains so far. This is a long term process, one which requires that communities continue to engage in dialogue with scientists and policy makers to ensure that the practical, day to day importance of understanding and using traditional knowledge is kept alive.

Amos Maggo
Labrador Inuit Association
(Transcribed by Randy Edmunds)

Char Fisheries in Northern Labrador

The Inuit of Northern Labrador have been using traditional methods of weir fishing since time immemorial. We found a shallow area in a particular river where char went up to spawn. These shallow sections were partially blocked off with rocks and when char were swimming through the weir they could be speared with a "Kakivak" or char spear. This form of nomadic weir fishing was practised by the Labrador Inuit up until they were centralised into northern communities.

Weir fishing was done in the fall around the end of September - first part of October when char were going in the rivers to spawn. At this time the Inuit caught char to store in food caches so that they could be left until the people returned from other nomadic routes chasing the caribou herds. After the Moravian missionaries came to Labrador and many Inuit moved into established communities, the weir fishery became a communal fishery. This was a case where the whole community went out and took part in the fall harvest of char. Char was then taken back and distributed throughout the community. Every family would get a share of the char that was harvested.

With more influence of outside interests, the traditional char fishery began to take on a commercial aspect around the early 1800's. Char at this time began to be harvested with nets and salted or pickled and bought by the Moravian mission. Trading was done not with money but Inuit traded salted char for clothing and food supplies.

After Newfoundland and Labrador joined confederation. The Newfoundland government took over buying salted char from the fishermen. In the early 70's fish plants were constructed in Nain and Makkovik and char were then bought fresh from commercial Inuit fishermen. With the char fishery having become a major source of income there are many concerns today about conservation and many forces playing a role in environmental damage. In the midst of all of this there are large communication gaps that need to be addressed to acknowledge common concerns.

This communication gap is getting smaller through meetings such as this where common concerns are being shared and action plans are being discussed. We now know that what unites us is much more important than what divides us. Sustainable development is still a big challenge and we have to fully understand the time meaning of sustainable development. I find it very unfair that the victims of technology are asked to provide information on the damage caused by the very technology that has been imposed on us.

We are survivors, have been, and we will continue to be survivors. It is important to remember that when the possibilities for life are over the survival instinct of our people kick in. In Labrador we are still living and we don't want to reach down to the level of having to fight just to survive. It is our traditional knowledge and expertise that has allowed us to survive. It is this knowledge and expertise that allows different aboriginal groups to have a better knowledge of each other's concerns.

Richard David
Department of Environment,
Mohawk Council of Akwesasne

Naturalized Knowledge System on the Environment as it Applies to Thanksgiving Address

Greetings. I'm happy to be here with you. I am Mic Mac living in a Mohawk Community. My dad was Mohawk, my mom Mic Mac. We are a matriarchal and matrilineal society. My mom is Eel clan so therefore I am Eel clan as well.

It always gives me great pleasure when I am given the opportunity to speak about our environment. When I first got involved in the environment I thought it was all quite simple. Never take more than you need and never waste what you take but with the idea that there is a limited supply. I guess that is sustainability. First Nation People have always practised sustainability, this process has given title to what we have done all along and it is always on our minds when we are making decisions in all aspects of the environment. My grandfathers talked about seven generations. A forest for seven generations. Water for seven generations. Air for seven generations. The animals for seven generations. We must always look ahead seven generations to ensure an on-going environmental balance.

You may ask, why seven generations? We all have it within us to conceive seven generations. We look to ourselves as one. Our children, grand children, and great grandchildren are at one end. Our parents, grandparents, and great grandparents at the other. Now all we do is start with our children and project ahead that same time span, and that is who our concerns about the environment should be focused on now. What we do will effect what will take place seven generations from now.

Akwesasne is involved with Eastern Ontario Model Forest and our influence around the Board table was such that now our motto is "A forest for seven generations." We have small wood lot owners, large industries, sugar maple farmers all working together to make the motto a reality. Act locally but think globally. We are in control as our ancestors' decisions were; we now feel the effects of their decisions good or bad. Our descendants will feel ours, good or bad.

At Akwesasne, we ran into environmental problems many years ago. Our first major confrontation was with Great Britain and the industries they represented. This was the construction of the Beauhourais Control Structure, near Valleyfield Quebec, in 1834 which was designed to raise water levels in order to make the river navigable and provide the area with electricity. Our Traditional Mohawk Council of Chiefs tried to explain to the governments and the industries that wanted this structure built, that the construction of this structure would flood our low lands; that we would loose vast areas of marsh meadows used for agriculture and livestock.

I need to explain about the leadership and jurisdiction we deal with daily at

Akwesasne. There are three different leadership bodies at Akwesasne. One is the Mohawk Council of Akwesasne which is sanctioned via the Indian Act. In power on the so-called Ontario and Quebec portion of the territory of Akwesasne. One is the St. Regis Tribal council put in by the USA and sanctioned by them to have power on the so called US portion. We also have the Mohawk Traditional Council of Chiefs which knows no jurisdictional boundaries and is the council that was in place before any Europeans set foot on this country.

When I say traditional leaders, I mean the original council. Our traditional leaders explained that we would loose spawning beds thus lowering the fish stocks in the river. They explained that we would loose valuable medicines. They explained that we would lose many animals and that overall, we would lose our way of life.It may have been the first ever environmental impact statement and the process was ignored then like it is today. Despite all this, they went ahead with the project.The British Government paid money but could not comprehend the long term damage to the environment and the negative impacts that would take place on the economy of the Akwesasne.

After that, in the years 1949-59, the construction of the St. Lawrence Seaway and the power station with its huge dams started. Our leaders explained that there would be vast areas of land that would be flooded. Some of the burial grounds would be flooded or dredged without proper consideration of our ancestors remains. Our people lost more lands along with valuable trees, medicines, and animals.

Along with the dam came cheap hydroelectricity which attracted large industries to the area. All this added strain to an already stressed area. Pollution began spewing from stacks all around us and our waters were being filled with all kinds of poison.

It seemed that every time we protested along the way, the outside communities made it tougher and tougher for our voices to be heard. Our concerns fell on deaf ears for some time. Just over twenty years ago, a young Henry Lickers, began working for the Mohawk Council of Akwesasne. He started a researcher working on health studies. The health studies became more intense with all the findings and more people began working on these studies. From here grew the Department of the Environment which continues to this day to raise environmental concerns at Akwesasne. Henry belongs to many Boards of Directors, science committees, working groups, and is a member of many environmental organizations so his work has taken our concerns world-wide.

The goals of the Department of Environment are to protect and enhance the natural environment of Akwesasne and the surrounding territory. We act as an information, research, and remedial facility, informing the Mohawk community of environmental issues. We also supply expertise to support other Native and Non-Native Nations.

It was not that long ago when we at Akwesasne seemed to be the only ones banging the environmental drum. It took us many years to get others interested in the environment. For some time we were labeled as trouble makers or do-gooders. The outside communities were afraid that if the industries were forced to run environmentally friendly factories, that they would be forced to shut down and many jobs would be lost. It took a while but we got them to listen.

Some of you may know my Director, Henry Lickers. I have worked with him for the past few years and my presentation today is the result of him sharing his thoughts with me. He would have liked to have been here with you today but our Chiefs at home require his services today. He says, knowledge is only powerful when it is shared and his knowledge becomes more powerful whenever I use his work.

At Akwesasne, we don’t talk about Traditional Ecological Knowledge or TEK. We call the process Naturalized Knowledge Systems or NKS. The term TEK seems to pull on the past and in my thinking locks me in a mind-set of that time frame. We use NKS because it allows for evolution, not only with time but from location to location.It is knowledge that naturalizes from a specific time and place but changes with time and or place.

I need to talk a little about Naturalized Knowledge Systems (NKS) before speaking of the Thanksgiving Address in order that you can grasp where I'm coming from. In the NKS Model developed by Henry Lickers (1994) we look at six basic principles. Everything else develops from these. These principles are:

1. The Earth is our Mother.
2. Co-operation is the way we survive.
3. Knowledge is powerful only if it is shared.
4. The Spiritual world is not far from earth.
5. Responsibility is the best practice.
6. Everything is connected to everything.

These principles will help researchers understand that when working with First Nation Communities that respect, equity, and empowerment have to be included in order to generate enthusiasm or zeal. Most First Nations Communities equate knowledge, personal networks, social and political power as equity because dollar equity can be hard to come by and potential partners in environmental projects will usually fund because they have much to gain in these partnerships.

When we speak of Native People or First Nations People we always include in our thoughts more than just North America. Included in our thoughts are indigenous people from all over. Our travels to other communities in countries like Mexico, Costa Rica have reinforced the idea that our concerns about the environment are similar. Some of these people are now at a place in time where we were just a few years ago. By addressing these issues with NKS we hope to eliminate mistakes we made along the way.

The first principle, "*The Earth is our Mother*." We must treat her with respect and honor. We depend on her for our existence. We are a part of her in life and we all will return to her loving arms when we leave this world. Our people still perform honor songs and dances for our Mother. We dance with moccasin feet to caress her tenderly. We inform her in our burnings before we plow her fields. We thank and honor her for her bounty.

"*Cooperation is the way to survival*" is the second principle. We believe that by cooperating with one another in all aspects of life, we will survive all the adversities of our lives. We are interdependent for good life; if any of us does anything to harm our situation, more than one will feel the effects even if that adversity is aimed at only one person, race, or nation. Chief Seattle is credited with saying, "What we do to our Mother, we do to ourselves."

Principle three, "*Knowledge is powerful only if shared*." Knowledge does no one any good if all we do is sit and think even if we are the most knowledgeable person in the world. In order for that knowledge to be powerful, it has to be shared with someone. It becomes more powerful the more it is shared.

Principle four, "*The spiritual world is not distant from the earth*." It is an integral part of being. Emotions and feelings have substance and must be acknowledged as important facets of human existence.

Principle five, "*Responsibility is the best practice*" teaches us that if we are all responsible for actions,our actions will bring us closer to harmony.With harmony, we will ensure our world will be a better place.

Principle six, "*Everything is connected to everything*" tells of the interdependence that we have as people with all of creation. If you study the forest, you have to look at the rivers, the birds, the animals, the plants, and everything else. Every strand in the environment has a purpose and every purpose is important to a balanced environment.

Chief Seattle is credited with the following words from 1854:

"You must teach your children that the ground beneath their feet is the ashes of your grandfathers. So they will respect the land, tell your children that the earth is rich with the lives of your kin. Teach your children what we have taught our children, that the earth is our mother. Whatever befalls the earth befalls the sons and daughters of the earth. If you spit on the ground, you spit on yourselves. This we know – the earth does not belong to man; man belongs to the earth. This we know, all things are connected like the blood which unites one family, all things are connected."

It is not enough anymore to say that we should leave this world to our children in the same manner that we inherited it.It has come to a point that we must do something to leave this world a better place than we received it.

Time has come when we must set priorities and one of the methods that is obvious to me and others, when it is pointed out, is to follow the words of the Universal Thanksgiving Address that the Haudenosaunee follow. Even the order of thanks should be followed as a guiding principle.

At Akwesasne we have an Environmental Assessment System using the Thanksgiving Address. We have hired Kirby Jock as our Environmental Assessment Specialist and he has developed a format with the following in mind.

I want to talk about our Thanksgiving Address (words before all else) and what it means. I will explain how we use it to look at and evaluate our place in the natural world. The Thanksgiving Address is a good vehicle to express a Native Perspective on the environment. We follow a specific order when giving thanks and that same order is a good place to focus our attention when it comes to the environment.

In our address we start with the people. We have been given instructions by our Creator to live in harmony with all living things. We have been given the responsibility for all other living things in this world. We do have the power to change things. We are the only living creatures that can make these choices.

We have the choice to do good or bad – to do right or wrong.In environmental assessments, we have to look at the people that any changes will effect. We also look at the people that might cause these changes as a means to lessen any impacts that the changes may have.

We then turn to our Mother, the Earth, for she gives us all we need for life. She supports our feet as we walk upon her. We need to realize that we have to be gentle with her. We can no longer abuse her if she is to continue to provide us with all our needs. The photograph that was taken of the earth from the moon made us realize just how fragile our world is.

My first trip to the beautiful Northern coastal area of British Columbia and the trip here really convinced me that our Creator knew exactly what he/she was doing when this land was created, despite the Duck Billed Platypus. This land along the coastal area is so beautiful, almost to the point of disbelief.

Any EA concerning Mother Earth has to include all aspects and the thought that everything is connected to everything so every angle has to be looked at. It worries me when we hear that they are bringing in special beetles to destroy the purple loosestrife. There is also an exotic tree (Water Hyacent) in the everglades that is taken over vast areas of the wetland. They are bringing other beetles here to deal with that as well.What happens after? Where will the bugs go from here?

We then turn our attention to the waters of the world in all of its form. Water is the source of strength. We include all the creatures of the rivers, seas, oceans, streams and so on for each has a duty in the purification of the waters. Recently I saw a television show that explained that right now in this world we have all the water that we will ever have here. In fact all the water we have now is the same water our ancestors had many years ago – not a drop more or less. We have destroyed the level of usable/healthy water through a number of events. We may eventually get back the use of those drops of water but realize that we are also continuing to contaminate other drops as we go.

Our biggest water concern is the St. Lawrence River; once a mighty river. Construction on the river has reduced it to a series of lakes sectioned off by a series of dams and locks. The flow has slowed so much that areas of the St. Lawrence have lost its ability to purge itself of contaminants and other sediments. Spawning areas have been covered by silt and other debris.

We turn to all the different plants from flowers to herbs, from those that add beauty to those plants we eat, from land plants to water plants. We acknowledge the medicines that have kept us in good health. In most cases in the natural world there is a balance. For example, where you find poison ivy, you will find jewel weed which is the cure for poison ivy. All plants have a purpose in the harmony of life.

We acknowledge those people that have the knowledge of the uses of these plants and their willingness to share that with others. Our Creator set forth a plan for all things; we tried to change things but didn't do a good job doing that, look at the Purple Loosestrife that someone thought would add beauty to their lawn or garden. Look at what that has done. Our wetlands are slowly becoming useless for the usual migratory birds that have come to our wetlands forever.

We now look to the animals for they have much to teach us. We honour them in our songs and dances. They in turn, give their lives to us in order that we may gain their strength.This then gives us the responsibility to do those things necessary to protect their environment in order that they survive as a species. This is a true representation of the independency that our Creator set up in the balance of life.

We then turn our attention to the trees of this land. Some trees provide us with fruit, some with nuts, some with material to build things, some with fuel to heat our homes or to cook our food.The White Pine is a symbol of peace and unity within the Haudenosaunee.

We include all of the birds. They add beauty and grace to our lives. The birds fill our ears with music. The birds fill my heart with joy as I dream of the far off places that they travel. From the tiniest hummingbird to the majestic eagle, we honour them all.

We then turn our attention to the four winds. The winds bring us the rains and the change in the seasons. They whisper in our ears and we wonder of other unseen forces. The south wind brings us warmth and announces the coming of spring. The west wind is our prevailing wind and represents stability and dependability. The north wind cools us and announces the coming of winter. It warns us of the coming chill. The east wind seems to always bring us days of rain or snow.

We include our grandfathers, the Thunders. They provide us with warning that a storm is about to descend on us. They also provide the spark of the forest fires that open the cones to renew that section of the life cycle. They bring us the rain that renews life.

We now look to the sky and begin with our eldest brother, the Sun. It is the source of all heat, fire, and light. We include with our thoughts, our Grandmother, the moon. She watches over the birth of our children. She changes the tides of the oceans and renews the life in the oceans.

We also include the stars of the universe. They assist us with our travels, they provide us with much beauty in the night sky. The stars demonstrate the vastness of our Creator's ability and wisdom and longevity of being.

We turn our attentions to our Enlightened Teachers. It is their teachings that enables us to fulfill our original instructions. It is because of their teachings that I am able to stand here today and offer these words to you.

We now turn our attention to the Creator. It is the Creator that provides us with all of the things that I talked about and much more. It is the Creator that gave us all the ability to act as independent people with a high degree of interdependence on everything around us.

We have chosen to be here today because each and everyone of us has the ability to carry out the original instructions as provided to the first people of this world. I hope that this is not the end of living and the beginning of survival that Seattle spoke of.

We at Akwesasne use this Thanksgiving Address as the guiding principles in Environmental Assessment. It is our tool that enables us to look at the environment as a holistic thing or event that it is. Everything is connected to everything, as I said earlier. It is our belief that if you want people to remember something important, explain it to them four different times.

We continue to tell anyone that may make decisions on the environment to keep in mind the next seven generations. We are the seventh generation that our ancestors were concerned of all those years ago. Let us repay that respect to our environment. As I stated earlier, when we first started back in 1976, we seemed all alone in a never ending battle. As an example, we started testing for flouride in our air, land, and water and other contaminants came to the surface like mercury, mirex,and PCBs.

We began testing breast milk which in turn lead us to testing blood from umbilical cords for possible contaminants to our newest generation.All of this work at Akwesasne lead to include the watersheds of the St.Lawrence River which in turn lead to our involvement in the EAGLE Project. EAGLE means Effects on Aboriginals in the Great Lakes Environment. When we started working with other First nations, we discovered similarities in how we exchange knowledge. This has brought us to NKS Project here.

We at Akwesasne are involved in a NKS project which involves a number of other First Nations from Tobique in New Brunswick to its newest member at Kingcome Inlet in British Columbia. We are looking to elders in communities to determine how knowledge is exchanged from generation to generation.

The First Nations communities have traditionally depended on renewable resources of agriculture, hunting, fishing, trapping, and gathering. The sustainability of all these activities required sound management developed over thousands of years. Among First Nations groups, there is archaeological evidence that there was considerable trading amongst First Nations.

External forces of huge population shifts with no knowledge of the 'new' continent, thus no appreciation of what was available, produced unsustainable activities too often inappropriate and taxing on an over-burdened land and water. The collapse of coastal fisheries, the denuding of herb plants, the decimation of uncounted animal, fish, bird species, the unabated ability to pollute any water, and devastating forestry practices will be questioned for generations from all people, not just us.

While we can name the changes that have occurred, what we are lacking is structure, formalized analysis of these changes which enable to assess damage already done and to analyze causes of these detrimental changes in order to slow down their impact or, if possible, to reverse these trends.

Thus, the analysis and evaluation of changes in environmental indicators, as seen by communities, will significantly assist in preservation of the existing knowledge of sustainable use of renewable resources. This knowledge can be of importance for the non-First Nations communities nearby and the society as a whole – there are certain lessons about the use of resources and existence as part of our physical and living environment where we are well ahead of non-First Nations communities.

There has to be a link of NKS and western science in order for others to see what we see. Linking these two knowledge systems will strengthen both of them. The main advantages for First Nations communities are as follows:

1. formalize the existing knowledge in a form that make it more accessible
2. western science is a valuable source of information for validation of NKS
3. development of in-house scientific expertise through melding western science and NKS is another way of empowering communities: as that expertise increases, *communities are no longer at the whim of external "experts*."

The environmental services established in our community created the basis for the work with other communities in Canada. In this project, Akwesasne acted as the coordinating community and the Institute for

Research on Environment and Economy (IREE) of the University of Ottawa fulfilled the role of technical support.

The methodology of the work with communities can be described as a process which entailed several stages. First, the selection of the participating communities were approached and the possible project structure, funding, goals, and management was explained to community and Chief and Council. Second, the community representative started working in their communities with the support from the Environmental staff of MCA and IREE.

There were several criteria for the choice of participating communities. First, and the most important was the community willingness to participate in the project. The selection of community representatives was dependent upon the decisions of the communities. There were two criteria that the selection process of the community representative should be a person with a certain degree of 'formal'education and able to do the required work. Secondly, a community representative should be able to capture the First Nations environmental knowledge, be able to work with elders in the community and have the respect of the community.

The First Nations that were or will be involved are — from east to west: Maliseet Nation at Tobique, Algonquins of Kitigan Zibi, Akwesasne, Opaskwayak Cree Nation, Cumberland House Cree Nation, Little Red River/North Peace Tribal Council, Treaty 8 Tribal Association, Tsawataineuk of Kingcome Inlet.

We hope that in future years we can once again stand before you and talk of a success story that will involve many more First Nation Communities across the country. Thank you for listening and I hope that you can go home from here with the ability to make positive decisions with a view towards our unborn, seven generations from now.

John Howell
Labrador Métis Association
(Transcribed by Maura Hanrahan)

Taking Care of Each Other: The Relationship Between the Labrador Métis and the Environment

A century ago a stranger came to Labrador and called it "the land that God gave to Cain." The name stuck. But it was wrong. Labrador is not a barren, empty land. For us, the Labrador Métis people, our home is a bountiful land. The land has been good to us. Rather than being empty, it is full. Rather than being barren, it is fertile, giving life to everything from tiny plants to huge herds of caribou. The land and the sea never fail to provide for us, except when people actively show disrespect for it. The only time this happens is when people take actions that show they have lost respect. When this happens, the end result is a catastrophe, such as the cod moratorium and the uncertain future of other species.

The notion that the land in northern regions like Labrador could be friendly and generous often strikes outsiders as strange, but let me give some examples of how the land provides for us. Many people found their appetites declined and their energy reserves were low at the end of a long winter. Obviously, it wouldn't be wise to let this condition go on too long.As always,the land provided the solution. In this case it was the bog bean. Our mothers would go to certain bogs and, and using a hook retrieve this plant growing underwater. Then they steeped it and gave us the liquid to drink. It didn't taste good, but it was effective. Those who needed it and took it felt better before long. Then they would prepare to go to summer stations with everyone else.

Another problem that cropped up occasionally was broken bones. For many years nurses and doctors were rare visitors on the coast that is the heart of the Métis territory. We relied on our own medicine that developed over many years and was specific to our home,Labrador. In the case of broken bones, we used birch bark to fashion casts. These would be left on until the bone set.

Another frequent problem was frostbite. We treated it by drying out the crop of a partridge and placing it on the frostbitten area. These are just a couple of examples of how the land has provided for us. Our elders taught us that a solution for every problem is found in nature. They showed us this every day in the way they lived their lives.

The Labrador Métis have always lived off the land and sea. Everything we had was derived from nature: our food, our clothes, our boats and komatiks, our snowshoes and boots, our summer and winter houses, our fuel,our medicine. We learned to create these things from our Inuit and Innu ancestors. And we brought our own adaptability to bear on our lives on the Labrador coast.

The idea that people were meant to dominate nature is not part of Métis culture. Our history is not one of shaping and reshaping

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nature. We know this is the European ideal. It is what allowed agriculture to develop. But Labrador invites its people to fish, hunt, and trap – rather than sow seeds. So, although our ancestry is European as well as aboriginal, our ancestors knew that this ideal would not work in Labrador.

They also knew that our resources had to be respected, not abused. They knew that the land would take care of us only as long as we took care of the land. They passed on the knowledge that we had to be keenly aware of our responsibilities toward the land. They taught us that if we didn't live up to our responsibilities, the land would not provide for us. And, or course, this is what happens more and more in the modern world.

Our ancestors developed an elaborate set of unwritten rules about how we were to interact with the land. Perhaps the most important of these had to do with the scale of harvesting. In other words, we were taught only to take what we need. Elders and all adults, in fact, insisted that we never kill anything we didn't need. They told us never to pick idly at a tree trunk or to pull up a plant. Our parents didn't wait til we were out on the trapline to tell us these things. They were taught from early age, often as part of story telling in the evening. The elders believed that if you harm something now, you may need it later. Unnecessary harm to any living creature would bring swift chastisement. Everyone had this code of ethics instilled into them from infancy so these things didn't happen very often.

There were many strict rules about the methods of harvesting. There was no such thing as open access. The idea that you could hunt whenever you liked or take as many birds' eggs as you liked did not exist in Métis culture. There was no hunting during the caribou calving season. We harvested eggs only from the species that were plentiful and we were careful not to take too many.

We learned early on in our lives that you had to use every bit of whatever animal you harvested. Our prime directive concerning wildlife management was "do not waste." Any wastage would provoke the elders' anger so it didn't happen very often. The seal is the central animal for us. From sealskin, we made waterproof boots, jackets, pants, sleeping bags, and whips for the dogs. We also made soap, and rendered oil for oiling snowshoes. We made thread out of the seal's windpipe. And we got plenty of food from the seal: kullucks (a dough ball made with seal fat), blood puddings, and seal pie, and food for our dogs.

We had a mentor system. This applied for trapping, fishing, and hunting. Adults first took boys on the trapline when the boys were about 10 or 12. The boys were expected to be obedient and to watch and learn. The men would tell them to watch while they demonstrated something — maybe setting a trap or laying down a scent. Then the boys might have to do it themselves. A boy learned in stages and it would be a few years before he could go out to the distant traplines himself. Boys usually had their own small, local traplines.

Each trapper had their own family-based traplines and this was respected by all the other trappers. They spread out far and wide so that everyone could get their fair share and so that the animal populations wouldn't be depleted. Trappers were on their lines for weeks throughout the fall. They returned home in time for Christmas if they could. It was similar to the fishing grounds. Every family had their own berth, a particular area on the water, and everyone else respected it. This was where they fished year after year and generation after generation.

Everything was shared. The strong tradition of sharing in Labrador Métis communities has survived the modern era. For instance, a piece of the first salmon of the year is given to everyone in the community. This happens with square flippers which are large migratory seals, a flag is usually flown to announce that someone has caught one.

All these practices reflected a strong conservation ethic. The Labrador Métis practiced conservation in a conscious manner — although we did not use this word. We had models for sustainable development —

although we did not use this phrase either. The old people would always say, “keep it for another year.”

These practices have always been at the centre of Labrador Métis culture. Our pattern of seasonal migration also reflects how we see and interact with the land and sea. Our lives were based on the seasons. Each year, we trapped and hunted in the fall and winter. In the spring we harvested birds’ eggs and seals. In the summer, we moved out to our summer stations – small communities of only a few families. These places are very dear to us. They have names like Triangle, Punchbowl, Venison Tickle, Spotted Islands, and Snug Harbour. In the fall, it was back to our winter homes scattered through Lodge Bay, Cartwright, Rexon’s Cove, and elsewhere. The seasons have always been a part of our lives.

Because of the way we lived our lives, we did not see ourselves separate from nature. We knew we were part of nature — part of the web of relationships that make up the environment. In fact, we were always very aware that we depended on the bounty of the land and sea. We knew it was not the other way around. We knew we were the ones who were disposable: not the birch trees, not the harp seals, not the eider ducks.

We knew, though, that we could upset the balance, that we had the power to do the damage. We knew that one harmful action could cause a chain of harm throughout the environment. For instance, overfishing a small pond would harm the mink, otter, and martin populations. So it is important — in fact, it is our responsibility — to make sure that our actions are good ones. This is necessary to ensure that our children and grandchildren are able to derive a living from the land.

Much of this cultural outlook and many of our practices are inherited from our Inuit and Innu ancestors. But even more than that, this way of seeing the land and sea was the most appropriate way for Labrador and Métis society. It made sense. It worked. It allowed us to maintain our families and communities for a long time. That’s why it became so crucial to Métis culture. Respect for nature, minimal impact on land and sea, and a just and equitable distribution of nature’s provisions — these things are good for us and for Labrador.

Métis elders and experts have a lot to contribute to environmental research. We are not saying science is wrong, just that we have knowledge which is bred into us. This knowledge can complement Western science. Our knowledge is wide-ranging. It includes the role of each species, the interactions between species, habitat features, behaviour, migration patterns, and sustainability.

This knowledge must be recognized in studies sponsored by the Institute. It should also be used as a screening tool for proposals made to the Institute. While there are many threats to Labrador Métis culture, the old ways still offer up the best answers for building a future that is environmentally sound and beneficial to everyone.

PART 2 HOW WOULD DIFFERENT WAYS OF KNOWING CONTRIBUTE IN ASSESSING THE EFFECTS OF HUMAN-RELATED ACTIVITIES ON THE ENVIRONMENT?

András Mák
Mamit Innuat

Summary of Plenary Session

Following a presentation by J.T. Inglis, whose goal was to set the context for the discussion,the participants decided to stick to a general discussion in plenary, given that there was not enough time to work in sub-groups. The points that follow summarize the participants' comments.

- The general problem associated with this issue is knowing exactly where to begin. First of all, people have to rally around a problem, such as, for instance, a large development project on the territory. The next step is to initiate baseline studies of the species likely to be affected by the project.
- The studies must be carried out in cooperation with the elders because native environmental knowledge is acquired over a long period of time.
- Scientific studies are conducted over a relatively short period of time. Cooperation between academics and native experts would make it possible to carry out more comprehensive studies. For example, a cooperative experiment was done in New Zealand by the university environment and the Maori people. They studied a species of bird harvested by the Maori, whose survival was becoming threatened. The experiment was a success,and today there is a data bank on this species, which was built on forty years of joint studies.
- Data bases consisting of native environmental knowledge must not be "dry" but rather related to culture and philosophy. They must be integrated into the community and its life. Consequently, community feedback on the work being carried out is essential. This is a dynamic relationship. Data are collected in the community, and they must then be presented to the community for validation and determination of how they will be used.
- The elders play a major role in the research process, but other groups must not be overlooked (young people, women, etc.). Together, they must discuss methods, approaches, ethical guides, and so forth. It must be ensured that the people participate in the research process, that they appropriate the work, and that they control it.
- The usefulness of the data collected can vary and meet the priorities of the community. For instance, the data can be used in textbook production, resource management, or environmental assessment.
- Research on native environmental knowledge promotes the continuity or survival of this knowledge over time, in a context where it must be recognized that things change and that knowledge and practices tend to get lost.

- The Innu believe that it is difficult for scientists to understand how they do their environmental monitoring.The source of the Innuís knowledge is the forest, and if the scientists want to understand the Innu,they must go to live with them in the forest.
- Observation forms the basis of the Innuís environmental knowledge.
- Certain elements of native knowledge are known (e.g., taxonomy), but not enough is known about the nature of the cause and effect (causal) relationship between the observations that natives make of their environment. Our challenge is to incorporate these causal relationships into the environmental monitoring process while remaining aware of the fact that this approach cannot explain everything.What we are trying to identify is environmental change. We can therefore ask ourselves what the "traditional" definition of change is in relation to a more political definition.
- The models used by scientists do not always capture the whole picture. Native models are often more holistic.
- The systems of native and western scientific knowledge are pursuing the same objectives and both include a descriptive component. However, their approaches differ by the nature of the ties that connect them to the territory. Native knowledge is acquired through observation and practice during the course of a long learning process that is shared by all the members of the society and passed on orally from generation to generation. Scientific knowledge is acquired by means of quantitative methods, by formulating hypotheses, and by verifying those hypotheses in the field.This knowledge is objective, and scientists maintain a certain distance from the object that they are studying.
- Among natives, knowledge is shared by all the members of the society, whereas among occidentals, knowledge is in the hands of scientists and is therefore accessible to only a part of the society.

Fred Roots
Environment Canada

Summary of Plenary Session

Report on plenary discussion,based on reports from the three working groups which met to discuss "how different ways of knowing contribute in assessing the effects of human-related activities on the environment."

Each Working Group was composed of about 15 people,chosen in arbitrary fashion to break up "cliques" and self-formed groups and thus to include a random cross-section of aboriginal and non-aboriginal participants. The method worked well, and the value of breaking into smaller groups where there was greater opportunity for each person to take part in informal discussion was well shown. Although all groups were asked to address the same question, each group developed a somewhat different character and approach,showing that there are many ways, all of them valid, of addressing this complex but important topic.

Facilitators for the plenary discussion: Tim McNeill and Jim Schaefer

Group 1

Facilitator: Serge Couturier
Reporter: Natalie D'Astous

This group started with a free-ranging discussion to identify what aspects of knowledge seemed, to the participants, to have similarities in both systems of knowledge and learning, and what aspects were recognizably different. The discussion then moved on to how those similarities and differences could apply to consideration of the effects or importance of human-caused changes in environmental conditions or wildlife and then to ways in which both systems could best co-operate or be most useful in addressing problems shared by all.

The Group agreed that "naturalized knowledge," the term used by the Mohawk Council of Akwesasne, was in most respects a better name than "traditional knowledge," for the comprehensive knowledge and learning system of aboriginal people which was transmitted through the elders, because it avoided the static and old-fashioned connotation which seemed to be attached to the term "traditional knowledge" and emphasized its basis in Nature.

It was agreed that the effectiveness of both systems depends upon both the experts and practitioners "learning a language of knowledge." The language was different and specific to the culture of each system, and to learn it took dedication and time from all who would use it. It was also agreed there were similarities in the objectives of each system — to learn about the environment, to know better about those things and characteristics that were useful to people. However, there was a general difference in the perception of human relationship to the land, animals and vegetation. Naturalized knowledge includes humans and all human activities as part of the land and its responses, while western science tended to look at human activities and non-human natural activities as independent but acting upon one another.

Both systems of knowledge were based on experience and experiments. But naturalized knowledge incorporated experiences into a synthesized way of life. Individual experiments within this system were part of the accumulated experience, and difficult to describe — the meaning was more important than the details. Western knowledge tended to be based on individual separate experiments and depends upon careful, usually written description or counting of details and separate activities.

The knowledge of both systems depended upon experts. In naturalized knowledge, the experts were people of long experience and judgement who assimilated the meaning of collective experiences into an integrated whole that was related to a spiritual foundation, whereas in western science the experts were often those who had the technical ability to conduct experiments, test hypotheses, or collect new information.

Both systems have a component of careful observation, and both have learned from accumulated information. But western science tends to look for systematic, step-by-step additions to information, whereas naturalized knowledge tends to learn by trial-and-error, with the lessons learned interpreted by the elders.

As a general rule, western knowledge depends on recorded information, including that transferred from somewhere else; whereas naturalized knowledge depends upon local experience, reflection, oral transmission, and explanations by elders.

In the process of learning, western science tends to separate the investigator or observer from the subject being studied; naturalized science makes no such separation. When a new activity such as low level flying comes along western scientists strive to learn what the noise or disturbance will do, for example, to wildlife, whereas naturalized knowledge will look at the increased outside human activity, including noisy aircraft, and at the responses of both hunters and caribou as part of a single package.

Within their respective cultures, both western scientists and those possessing naturalized knowledge agree on the fundamentals of knowledge and learning. On the one side it is a belief in the powers of observation and rational deduction, an acceptance of the consistency and uniform applicability of “fundamental” laws of physics and biological processes, etc., and in the ability to improve human understanding by progressive testing of human-devised hypotheses. On the other side there is an acceptance of the wisdom and rightness of accumulated collective experience of the community as expressed by the elders, a confidence that all observations and experience relate to a spiritual framework, and that natural phenomena as well as human actions are guided by influences greater than immediate human decision.

The steps forward were seen by the Working Group to be to understand and respect the differences in the two knowledge systems, and to recognize areas when they can work together, without weakening the contribution they can make independently. Efforts must be made by each side to recognize subject areas or problems that they both share, even if the way of looking at the problem is different from each. The Working Groups said this workshop helps show that it can be done.

But to get the best from each knowledge system and to find how best to work together, it will be necessary to get rid of the fancy words used by the scientists. Most of the problems, and the knowledge, can be explained in simple language. However, to understand the meanings of even the simple words takes hard work, time, and patience. It will also be necessary for the aboriginal people to speak openly about their concerns, and not be considered by western sciences to be simply storehouses of local knowledge.

Group 2

Facilitator: Peter Armitage
Reporter: Stas Olpinski

Members of Group 2 spent some time finding a useful way of communicating with one another on a subject as complex as systems of knowledge when each person is already embedded in one or other of the systems. That problem in itself showed the value of having such a workshop to address, deliberately, the similarities and differences of two distinctive world views and ways of promoting or explaining each view. It was recognized that it was necessary to get rid of "jargon;" but often what was the effective language of communication within one system seemed to be jargon or even not important to the other side. Right at the outset, it was seen that building respect on each side included recognition that each side had its "language" regardless of the way that the words were translated, and that respect for each system included acceptance of the different means of expression used and meanings expressed by each.

The Working Group went on to consider some main characteristics of any knowledge system, and then to the similarities and/or differences of traditional environmental knowledge and western scientific knowledge with regard to that characteristic. The result was a useful, if hasty, summary of similarities and differences, on which both aboriginal and non-aboriginal participants could agree.

OBSERVATION

Both systems were based on observation and field study. Traditional knowledge gathered its observation in the course of ordinary living, and more or less continuously, while in western science the observations tended to be deliberate and focused on selected details, separate from ordinary living, and directed toward a "need for knowledge" identified before the observations began.

PREDICTION

For both systems, an important purpose and use of the knowledge is to predict what might happen if events or trends continue on their present course, or if some contributing factors should change. The western science tends to relate conditions, factors and forces of change to some "known" laws and relationships, and then to propose and test hypotheses or modeled relationships to get some ideas on what might happen. The traditional environmental knowledge tends to assimilate all observed factors and collective experiences into the distilled wisdom of the elders, to consider trends that might be the result of many causes some of which were unknown and, through the elders, to relate characteristics and changes to spiritual forces as expressed through shamans, dreams, or the insight that comes from wisdom and trust.

COMMUNICATION

Traditional knowledge is mostly communicated orally or through physical example and practice. It tends to have continuity through several generations but the central core is continually added to and kept up-to-date. Scientific knowledge is mainly communicated through writing, quantitative expressions (numbers and relationships) or through the artifacts of technology; it is taught or transferred as a separate activity or study or learning, and is added to piece by piece in details. The central precepts of western knowledge are rarely expressed or communicated.

GROWTH OF KNOWLEDGE

Traditional knowledge accumulates through collective experience and wisdom by means of extensive and continued contact with the land in a fairly restricted area. The wisdom is cumulative, intellectually distilled in the light of changing experiences, but the basic teachings are very rarely rejected.

Western scientific knowledge advances through testing of hypotheses, increased precision of observation and measurement, insights that come from deduction or experiences in other situations. It may reject or reverse earlier knowledge that has been found to be mistaken or not useful. Such rejections or reversals to do not threaten western culture but are part of it.

QUANTIFICATION

Traditional knowledge deals with trends and relative abundances or changes in time or place; western scientific knowledge tends to value quantitative precision and absolutes.

SHARING OF LEARNING

Traditional knowledge is concentrated in the elders but incorporated in all who partake in the culture. Its acquisition is "free" to all who live the culture, but requires lifelong dedication and learning to acquire. Western scientific knowledge, although open to all, requires a monetary investment and dedicated study, concentrating on the science apart from other aspects of living. Many or most members of the western culture do not possess western scientific knowledge.

SOCIAL ELEVATION

Western scientists have established a hierarchy of classes (degree, etc.) depending on specific qualifications of knowledge and practice. They may or may not have prestige and respect of society in general, within their culture, depending on their behaviour and on the public acceptance of the topic on which they are engaged. In the aboriginal societies, the possession and use of traditional knowledge is integral but not separate in the respect that the society has for the individual. The respect in which the elders are held is accorded by society as a whole, not by virtue of a specific qualification.

NEED FOR TOOLS

In western scientific society, knowledge is increasingly compartmentalized and specialized, and each practitioner becomes more dependent on tools or technological aids (from a compass in the field to a computer in the office) in order to function effectively. It is a characteristic of traditional environmental knowledge that each individual possesses the knowledge, awareness and personal skills to function effectively in the environment in which he or she is living, and to contribute fully to society on the basis of that knowledge without an array of artificial aids.

SPEED OF ADAPTATION

Traditional knowledge provides for progressive and protracted adaptation and change, based on trends, or local pressures, but supported by an inter-generational perspective and the stability provided by a spiritual core. Western scientific thought looks for new advances, revolutions in ideas, and turnover of previous technologies, and adapts by new information rather than insight.

PREDICTION OF DISASTERS

Both types of knowledge are sometimes in agreement in cases where environmental dislocations may occur because human activities have "gone beyond what Nature can take." Examples are the recent flooding in the Lac St. Jean area, or areas of over-fishing. In each case, both types of knowledge gave advance warning of what might happen;- and what was predicted did happen.

Group 3

Facilitator: András Mák
Reporter: Randy Edmunds

This group addressed first the philosophical and intellectual differences and similarities of traditional scientific knowledge as a part of aboriginal cultures,compared to western science as part of technical societies and cultures. It then moved to discussion of the linkages, pressures for amalgamation and adaptation of the two systems of knowledge, and examined some different characteristics of each system.

The question was posed at the beginning of the discussion on what perspectives or impressions do aboriginal people have about western science. Some aboriginal people felt that western science was cold, materialistic; it appeared to have no moral content. Traditional scientific knowledge, in contrast, was related to spirituality and the essential forces of right and wrong. Western science attempts to explain the characteristic and changes in the land, animals,etc., as being the result of physical and biological influences; traditional knowledge states that spiritual forces are responsible.

There are differences in the ways that knowledge is interpreted and passed on from those who possess it to those who are learning. Western scientific knowledge, at its best, is the same knowledge regardless of who possesses it, whereas there is a difference in the kind and significance of the traditional knowledge depending on who has it and who is going to use it. For example, western science, being as far as possible separate from individual people, is the same, or is intended to be the same for all genders and all classes of society;whereas the traditional knowledge passed on from women to girls is different in context as well as in subject from that which is passed on from men to boys. Although both types of knowledge are culture-based, western science purports to possess knowledge that is independent of culture or social setting, although the means by which it is expressed and understood is directly related to western cultures; whereas traditional knowledge is directly rooted in a specific culture and is related to a particular location where those who possess it live.

The question was asked: “If traditional scientific knowledge is gathered and accumulated through western scientific methods (e.g. counting caribou from an aeroplane), does it then become western scientific knowledge?” There was no consensus on the answer to this; but the statement was made that the basic characteristic of traditional knowledge was not how the knowledge was gathered or even the content of the knowledge, but the value and meaning attached to the information comprising that knowledge.

It was acknowledged that aboriginal peoples, through various pressures (e.g. land claims, low level flying, mineral development), are being forced to adapt and shape their knowledge, and the way they express it, to fit the format demanded by western science.When this happens, the knowledge may become distorted and some of the meaning is lost. Even the translation of indigenous concepts into words in western languages places traditional knowledge at a disadvantage. Persons of one culture cannot completely understand another culture through translation.

Can western scientific knowledge and traditional scientific knowledge be integrated? The Working Group was clear on this; - there is no point in trying to integrate the two systems, but they can be complementary. The two types can be used at the same time and can address the same or related subjects,with benefits to each, if each is understood and respected; but except for exchanging small details, it was not useful to try to mix them.

Each system has distinctive characteristics that can be used to advantage on issues where both are concerned.Some points made were:

1. Traditional science is long-term as it applies to human experience. It is localized to specific geographical or ecological areas of human practical acquaintance, and it relates happenings and changes to their human consequences. In distinction, western science has obtained its direct information usually over a comparatively short term. It can relate situations across large areas or over a wide range of environmental conditions not experienced locally, but it generally avoids linking natural changes to the human conditions, unless that is done as a separate exercise.
2. It was noted that long-term residents of the area who were not aboriginal but had lived in and depended on the land also may possess knowledge and viewpoints similar to those of aboriginal people, even if they were not members of aboriginal cultures. These people were not at the workshop.
3. Western science recognizes different levels of expertise that come from academic study, by awarding academic degrees. Western science and society is less clear about how it recognizes or respects practical experience or expert judgement. Traditional or aboriginal science has only one degree: “survival on the land.” But traditional cultures and communities recognize the expertise of elders and hold them in high regard.

It was agreed that there were several modes or patterns by which the relationship between western science and traditional science could be visualized. One pattern could depict western and traditional science as progressing along two separate but roughly parallel paths, with frequent bridges or lines of contact between them. This relationship was considered to be not very realistic because the attempts to communicate could easily become artificial and not represent either system of knowledge; and when the two paths sharply diverged as they would do at times, communication may be impossible. A more useful way of portraying the relationships was to think of the two systems as lines of knowledge following separate but irregular paths, each responding in its own way to the problems, opportunities and crises that they encounter (some of these problems or opportunities will likely be the same ones, as with regional decline of caribou herds or low flying aircraft). Sometimes the paths will diverge, sometimes they will converge; but it is unlikely that they will ever be identical.

The specialist character and narrow focus of western science may lead to overlooking obvious connections, and lead to much work in order to obtain a simple or self-evident result. The example was given of a fisheries biologist who needed to know areas of fish concentration in a given lake. After careful study of the whole lake, he identified a few areas where fish were concentrated. Only after having done the work was it pointed out that there was an aboriginal fishing camp close to each site and only near those sites. The same information could have been obtained by simply noting the locations of fishing camps. On the other side of the discussion, it could be noted that if the only purpose of this study was to find out where the fish were, the biologist accomplished in one month the same result that had probably taken the aboriginal people many years to achieve by trial and error. The lesson was that neither side should criticize the other without understanding the total picture.

The two knowledge systems differ in the way that those who hold the knowledge become convinced of its veracity and practical use. In western science, if a relationship is clearly demonstrated, and can be repeatedly shown to be so, the practitioners accept that it is probably true.“Seeing is believing.” In traditional science, on the other hand, relationships may be obscure or pronounced or given spiritual significance by the elders, after which the meaning and connections become clear.

"Believing is seeing." Both systems require the best possible observations and interpretations, but in different order.

In both systems, the knowledge is largely expressed through language - the languages of the culture within which the system resides. Attempts to relate the knowledge to common or shared issues, or to make them complementary, become exercises in understanding one anothers' language.

The separation of knowledge from the purposes for which it is used or from decision-making that is characteristic of western science contrasts sharply with the integration of knowledge with the purposes of the knowledge which is characteristic of traditional scientific knowledge. Aboriginal knowledge could,for example,have as its purpose to prevent any activity from occurring which potentially could damage the land; while western science might gather its knowledge to try to assess how much damage might occur if a particular activity were to take place;and that knowledge might then be used by someone else to stop the activity or to let it proceed at a cost.

Although acknowledging the many differences in approach and expression, there were many similarities between the two systems of knowledge. The Working Group concluded by listing a number of shared characteristics:

1. Both systems try to understand the environment and find some order in the universe, through care observation and applying logic based on culturally-accepted principles.
2. The resulting understanding or awareness of environmental condition or concern (e.g.poor physical condition of caribou) is often the same, even though western science may come to the conclusion by what it considers to be hard data and cold facts, while traditional science uses subjective comparisons and various lines of qualitative evidence of trends.
3. Both systems and their cultures recognize the need for knowledge to inform decisions and societal actions, and both must find continually more effective ways of applying that knowledge to the new situations or problems that are arising.

The Working Group agreed that science, in either or both cultures is a form of story telling. Science in either system is a way for finding an explanation for things that are not at first apparent, and of looking for causes and reasons or effects. In the telling of these scientific stories, hypotheses, information, observations, facts, myths, legends, theories and cultural beliefs all have an essential place in both systems. The difference lay, in part, in how openly these different elements were acknowledged and used.

Daniel Ashini
Innu Nation
(Transcribed by Peter Armitage)

Contributions of Different Systems of Knowledge

Good morning again. You may notice that we are in Part 4 of our workshop on using both systems of knowledge in solving research problems. I have been asked to speak to the issue of the contribution of different systems of knowledge. I have to say that I can only speak for one type of knowledge, and that is the traditional type of knowledge of our Innu elders, and how that can be incorporated, and be applied to the research projects that we are developing. I was hoping that someone from the western science community would also be involved here this morning, and speak to the issue of western science, and how it is going to be applied in the research projects.

First of all I would like to say that science is a newcomer in Innu territory. The Innu Nation has been involved in many projects including forestry, mining, military flight training, Trans-Labrador highway, snowmobile trails, fish camps, and so forth, and the Innu have become very much aware that science, in terms of western science, is very, very far behind the Innu in terms of how much it knows about our territory. It lacks a lot of baseline information based on data, as we have found out in forestry, in bringing in western science ourselves; in trying, for example, to see whether the forests here can sustain any kind of forestry logging. At that point the forestry department had never done that kind of forestry research before [*inaudible*]... We had to bring in a western scientist who had some understanding and willingness and interest to learn about the Innu knowledge about the forest.

That was a very positive experience for the Innu Nation, and certainly a very positive experience for the others who found out that this scientist was very much interested and very much willing to incorporate, include, their knowledge. In that regard, we were able to determine, not only in forestry but in mining as well, and I think military flight training, various studies that DND has been involved with in determining various species of wildlife [*inaudible*]... they completely missed it. The research about the land and the habitat and people in Labrador is very much unknown at this point in time. So I wanted to point out that, as I said at first, that science is a relative new comer to the territory.

In terms of trying to incorporate our knowledge into the research projects of the institute, becoming involved in this, I think one issue will be the questions that the elders have about the effects of western technology... can be a starting place for formulating research questions. There are some qualms right from the beginning, that there has to be discussion, meeting with the elders and the hunters, that a great deal of information and knowledge about the Innu territory that western science doesn't have... to come into it for formulating the research proposals to discuss what they are going to study, and what the concerns of the Innu are, and what the Innu are going to have included in the research projects.

First of all, the Innu will have to decide whether they are willing to participate in the type of research projects that are proposed because some research proposals may not be positive and required. I think once the questions, once the consultation and discussion has taken place, once the questions are determined, the consultation with the elders and the contribution of the community, elders and scientists can begin on the research projects. I think that will indicate that the research proposal is heading in the direction that the Innu feel comfortable with, that they have been consulted by the groups involved, and that their ideas and interests are included in the research proposal. I think that in this workshop, we have all heard from the elders that Innu science and western science have many differences, and they have some similarities, but I think on the aspect of differences on the two kinds of knowledge, the different methods have to be respected by both parties. Both systems of knowledge have to be incorporated in designing the research proposals.

I think that once we [*inaudible*]... they need to be discussed in open forms with other elders and see what it comes to at that point in an open forum, we can agree to disagree or whatever it comes to at that point. What we hope for, and what we are calling for, is the openness in the research projects on the part of western scientists. We are in 1997; we have a great deal of concerns behind us, where western scientists have come into the community and talked to a couple of elders, and the next time we hear about them, they have done their research and excluded us. In the final forum the Innu don't have a chance to agree or disagree with the results or incorporate some of their concerns or their interests in their final report.

I think we all agree that it is only a learning process when we talk about a new beginning. I think in a new beginning there is always a learning process, and frustrations or mistakes that we make. Western scientists will be concerned about completing their research projects on time and so forth.But I think that we have to say that we have concerns, and I am certain that both positions can learn from each other. If all of this takes place in the way that the Innu hope it takes place, I think that together, we can answer questions in ways where everyone might agree. We all hope that we can design research projects and carry out research projects in ways that we will all agree on. I think that this is what we all hope for and work for.

Thank you very much.

Gabriel Wapistan
Mamit Innuat
(Transcribed by András Mák)

Perspective on the Potential Contributions of the Innu Environmental Knowledge in the Research Projects of the Institute

I am delighted to be here with you today. I do not know how you live, you who come from the east and we who come from Natashquan or along the coast. I am pleased to participate in this meeting because this is the first time I have come to an anglophone community for such a meeting.

What I have to say today, I do not know everything, but that is where I lived, in the forest. I lived in the forest, and I was very small when I started to be taught about life in the forest. That is where my life is, in the forest.

Today, I still go out on the land in the winter and summer. I still go out on the land. But you, what I think, is that you should understand us. People have to understand one another. You have to try to understand us because we do not have the same mentality as non-natives. It is very difficult to get along, but we are going to try.

What I think about this meeting is that it is a little like if I was teaching a young person about trapping for the first time. That is how I see todayís meeting. Perhaps after four or five meetings, perhaps we will understand one another a little because it is very difficult to understand one another these days.

Today, when we go hunting, there is no longer much to eat on the land. Different activities have an impact on us because there is not much left on the land. There are no caribou, partridge, or hares. We have a hard time providing for our needs. We have nothing to blame you for but we do have something to blame the governments of Québec, Canada, and Newfoundland for. That is why we are speaking to you today. We want to make you aware of what is happening on the land. That is where we used to live before and that is where our medications come from to cure the sick. I like to be out on the land.

I am pleased to have spoken to you briefly, if only to tell you that there are activities that have an impact on us and on the land. There are the caribou that drowned (at James Bay). We could have gone to collect the caribou, but that is not your fault. However, if we had mistreated the governmentsí domestic animals,like cattle, we would have paid for it long ago

Fred Roots
Environment Canada

Inclusion of Different Knowledge Systems in Research

The two final objectives for our workshop, as stated in the information given to each of us before we came here, are:

- how can both systems of knowledge contribute, each in its own way, to the problem of assessing the potential impact of human activities on the environment?

and

- can we establish guidelines on how traditional environmental knowledge can be incorporated into the work of the Institute for Environmental Monitoring and Research?

You will notice that these objectives are loaded with "western" words and contexts:— "assessing the potential impact", "establish guidelines", "incorporate knowledge into work" — I really don't think that people whose grandparents were born around North West River are likely to talk that way. These objectives have been put into words by people who don't come from Labrador. But I think that most of us understand well enough what those objectives are saying, and it is these ideas that we want to talk about this morning.

I should say at the beginning that sometimes I feel very uncomfortable with the definitions that are given for "traditional environmental knowledge" and "western scientific knowledge", and even more with their labels TEK and WSK.Sometimes it seems that people who insist on classifying these "knowledge systems" don't have much knowledge of either kind. Where I grew up in northwest Canada,both the Indians who still lived in the mountains and the old mountain white men had very thorough *natural knowledge* gained from long observation and tradition, that was different from book learning. But *book learning* is also a very old tradition; it is also knowledge handed down through generations of study and recording of observation and experiment, and it is not only "western" in a geographic sense. Anyway, we have these labels for the different ways of knowing about the land in which we live and of which we are a part. One way is mainly, but not entirely, being taught directly by the land itself;— the other way is mainly, but not entirely, learning about the world through ideas and information that come mostly from somewhere else and bringing that knowledge to the particular place where we are. Let's leave the labels at that, for now.

SCIENCE AND THE STAIRCASE OF KNOWING

It is going to be hard to say anything about including different kinds of knowledge in research, without sounding like a professor or giving a sermon. We have already had enough definitions at this Workshop, and seen how hard they are to translate into other languages without destroying their meaning.But I have heard nothing in the last two days to change the simple dictionary meaning that

science *is organized and communicable knowledge of any kind.* If knowledge is not organized so that it relates to something or means something away from where the observation was made, it is not really knowledge, it is just a bunch of facts or ideas; and if that knowledge cannot be communicated to someone else who can receive approximately the same meaning from it as the person who sent it, it is not science.

In this definition, both TEK and WSK are truly science. However, they differ, often quite a lot, in the way that the knowledge is *orga - nized* and *communicated*.

Research , according to these definitions, *is the planned and deliberate pursuit of knowledge*.

What is knowledge? Of course,it is something you have in your mind, or some facts or ideas that someone is aware of and can speak or write about,and for which someone is reasonably sure about their being correct.In this sense, knowledge must be clearly distinguished from *data*, or *information*, and it is also different from *understanding*. A good way to look at the relationship between these concepts is to think about the "staircase of knowing" (Figure 1).This staircase applies equally well to TEK and WSK, but the words used may differ. It would be interesting as an exercise, to fit native words on to the different steps and vertical risers on this staircase.

Most knowledge starts with *observations*, — sometimes, in western technical science, it starts with *mesurement*.When the observations or measurements are related to some standard or common experience,they become *data*:

- that the lake froze last night is an observation.That the lake is frozen on 23 October is *data*.When data are selected, tested for reliability, related to a subject or problem, they become *information*. I have to ask a question about the simple fact that the lake is frozen, before I really have some information. And then if that information is organized, interpreted, or applied to some problem or story, it can become *knowledge*. That the lake froze last night, on 23 October, two weeks earlier than last year – this can be knowledge
- and if that knowledge is assimilated together with other knowledge and integrated with what is already known, it can become *understanding*. In our example, two days of strong north winds followed by two days of calm cold weather might give some understanding of why the lake froze two weeks early.

And, of course, understanding, put into perspective with judgment according to respected human values, can lead to *wisdom*.

Notice that as one proceeds up this staircase, the content and the ideas become more

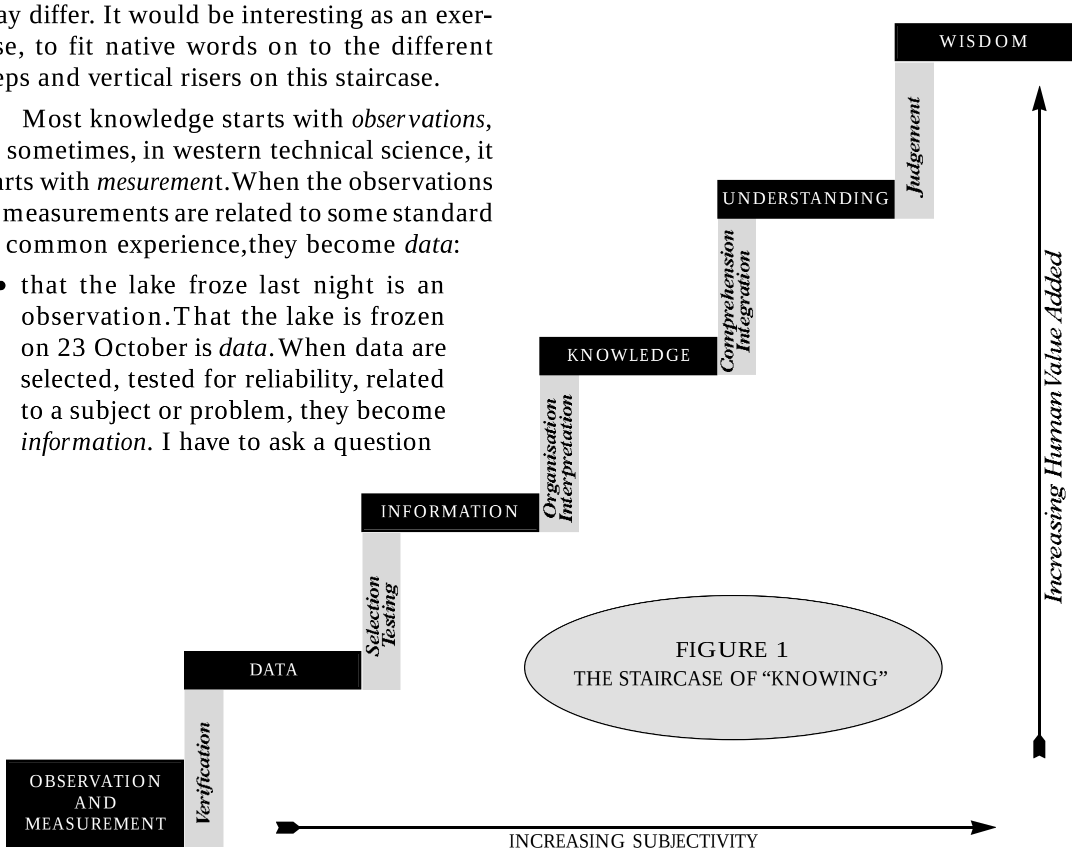

FIGURE 1
THE STAIRCASE OF "KNOWING"

subjective, and carry more human values. As Professor McOuat said yesterday, there can be no knowledge that is completely objective and free from human value.

Where does science fit on this staircase? Clearly, on every step. One might think of science and research as a sort of railing that helps individuals, or society, move from step to step – or on which one can jump to get a short-cut to the bottom,to make more observations, if one is stuck half-way up. For the staircase must be descended as well as ascended.

Western science, it seems, is concerned mostly with the first four steps of this staircase. We tend to expect science to stop with knowledge, and then expect the common sense of the public, the businesses, — and maybe the Wing Commanders — to turn that knowledge into understanding. In this cynical age, westerners don't expect much beyond that; but we may be lucky if some politicians and poets can provide the wisdom.

Natural or country knowledge, or TEK, in my observation, often tends to collapse the first three steps as part of living and learning in the environment itself, and focuses on the relationship between the top three steps. The wisdom of the elders leads down to and also is informed by, understanding and knowledge of the particular subject or problem to be dealt with.

How many times have you heard it said, in modern western society, that if only we had more data, or more information, we could make better decisions? And yet, there has never been a society with so much data, on almost any conceivable subject and problem. Our experience with the problems of the country and the world, and the local problems in this part of Labrador, does not give assurance that better decisions will come from putting most of our effort into the bottom steps of the staircase. What we need is help from the upper steps. I would ask you also, to think of the wisest person you know — wise in any subject you choose, or wise in general. Is that person wise, in your estimation, because she or he is full of data and information, or because of the ability to distill information into wisdom?

On the other hand, our experience also shows, here in Labrador and elsewhere, that the traditional knowledge system, by concentrating on the top half of the staircase, is vulnerable to being at a disadvantage when completely new problems or issues arise because the society does not have sufficient information, or experience which can relate to the new situation, to provide the in-depth knowledge of issues upon which understanding must be built.

Perhaps I have carried this staircase analogy too far. In dealing with major issues today where indigenous people have political power and heavy responsibility — such as with low-level flying, or commercial mineral development —, but do not have the technical familiarity with details or the decision infrastructure assumed by a "staircase of knowledge", it may be better to think of TEK not as a staircase but as a big cooking pot or community cauldron.Experiences and object lessons and stories from the past go into the cauldron,the workers and hunters and young mothers and youths keep the fire going, the elders stir the mixture, and everyone dips a ladle in and is nourished by the brew. If one follows this analogy, it is clear why no two brews are the same, and why the product, essential to nourish the community, is very hard to analyze.

CHARACTERISTICS OF KNOWLEDGE SYSTEMS

We have spent the past day examining some characteristics of traditional (naturalized) and western (scientific) knowledge systems. Prof. Berkes,Prof. McOuat, Mr. Inglis, Mr. David, Mr. Guanish and several others have given useful summaries of the distintive features of the indigenous-based system.And those who were with us two days ago heard from Mr. Standen,Mr. Bird,Mr. Chubbs and Capt. Larue present to us a fine example of use of sophisticated western technical science applied to an operational problem.

This is not the place to add to the comparisons, similarities and differences already pointed out and highlighted in the workshops last night, but if we are going to consider how to use these two systems to assess the impact of human activities on the environment, and to aid in the work of the Institute — which are the objectives of this Workshop —, perhaps we should look at some of the characteristics of these knowledge systems from that point of view.

Much has been made — and properly so — of the general characteristics that:

(i) Western science tends to separate the investigator, and humankind, from the non-human "natural" world, whereas naturalized science starts from the truth that humans are part of the total environment, integrated with what affects it and with how it is affected, and therefore studies the whole complex structure.

- One style of science is analytical, reductionist.
- The other style of science is synthesizing, integrative.

(ii) Naturalized traditional science is rooted in specific locations, and is composed of the contexts and experiences of a relatively limited and homogeneous society, collated through a fairly long period of human oral history; whereas western science, while it has access to knowledge from the distant past as well as current observations in many and varied places, searches for ideas and relationships that are as abstract and transferable as possible so that they may be applied to many new and different situations.

- Western science is a commodity to be exchanged, traded and used.
- The knowledge of naturalized science is a part of one's being, and is changed if it becomes also a part of someone else.

(iii) In naturalized science, time and place are integrated into the scale of personal human and societal experience; whereas western science ranges in scale from sub-atomic to the galaxy, and from nanoseconds to billions of years.

- Naturalized science integrates a time perspective over human generations of collective memory of the past, and projects over several generations into the future as part of an unbroken progression or cycles of nature.
- Western science makes extrapolations to the past based upon precise but short-period measurements and observations, and is suspicious about projecting into the future except for physical constants and processes.

(iv) In most western science there has been, at least until fairly recently, a goal of ignoring, dismissing, or excluding spiritual or mystical aspects of phenomena or their consequences; whereas spiritual aspects, in a wide range of meanings, are often central in indigenous naturalized science.

- Western science regards all phenomena and conceivable ideas open to the assault of rational thought and human investigation, and that which is unknown is taken to be a reflection of inadequate scientific knowledge.
- Natural indigenous science tends to reserve a place for phenomena which are basically and fundamentally unknowable and unsuitable for research, and the unknowable core gives strength to the knowledge system.

These differences — and several more have been pointed out — have particular significance in the context of assessing the impact of human activities on the environment, and on the future work of the Institute for Environmental Monitoring and Research. For example, in western science it may be straightforward, if not easy because of inadequate data, to estimate the ecological significance of a given impact or change in wildlife or environmental conditions, and from these estimates to apply economic or expressed social criteria to assess the human significance. But such a step-by-step approach may not be valid in naturalized science, where the effect on humans happens simultaneously and along with the effect on non-human life in the affected area.

How would one use these differences in the actual work of the Institute? Our workshop discussion last night showed that it is simplistic and not helpful to attempt to integrate these knowledge systems into a single summary of what we know, and today we want to think about how each, and *both*, ways of looking at environmental effects can contribute to useful recommendations about the effect of low-level flying.

Let's take osprey breeding as an example. Each person in this room has some knowledge or ideas that low-flying aircraft can disturb ospreys sitting on their nests during the breeding season if the planes come too close. Some of us think of that situation from our habitual viewpoint of "western" biological observation and study. Others here are thinking of the problems from the point of view of the ospreys who are our neighbors and who, like us, fish in the same waters that we do. Now, suppose it were established that after two years of low-flying, it was found that there was a 25 percent drop in young osprey growing to maturity in each of those years. How would each of us, from our respective viewpoints, use this knowledge or expect it to be used by the Institute, to make recommendations to the authorities about the low-flying programme?

And we can carry this mental exercise a couple of steps further. We each can ask ourselves: how will the knowledge of the change in future osprey population help each culture and each kind of society adjust to or cope with not only the osprey problem but new threats – let's say from pollution? It is fairly easy for those in the western society structure to say that this is a different but straightforward problem; however, the procedure for assessment has already been set up; some criteria for acceptability for the new threat will have to be established; then we will have to get the data, make the assessment and come to a decision. The naturalized indigenous society is likely to feel that the possibility of pollution is not a different problem but a new dimension of the osprey problem because both are manifestations of the intrusion of alien impacts on the integrated natural system including the people, and so the environmental information is just a part of the evidence needed to address, in a credible way, the net costs and the net benefits of the decisions to carry out and expand the disturbing activities. The paths taken, and the level at which the concerns will have to be addressed if the concerns are to be satisfied, may be quite different between the two systems. Both systems are scientific, as we have been discussing the concept here. But one way is mainly technical, using social and political judgment to achieve an accommodation as far as possible, to one kind of disturbance at a time, with least dislocation of the established operational activities. "Assessment" leads to "decision". The other way is largely political, in the best sense of the word; it brings social concerns and environmental evidence together to achieve,as far as possible, a more satisfactory concept of the whole operation."Assessment" and "decision" are not separated.

The Institute must be able to understand, and support, ways of using both kinds of knowledge. In this respect, the Institute for Environmental Monitoring and Research may be unique among environmental or impact assessment organizations in Canada. As Daniel Ashini has explained to us, the Institute owes its existence to Innu concerns, supported by concerns of other indigenous nations in the affected area, backed by a growing recognition of the scientific validity of traditional ecological knowledge.Most "environmental assessments"and their institutions are structured around conventional "western" industrial science, with the indigenous knowledge and concerns,if acknowledged at all, as peripheral minor add-ons; but this one is quite different.

THE KNOWLEDGE SYSTEM AND SOCIETY

Perhaps the biggest differences that the Institute will have to deal with lie not in the different characteristics of the two systems of knowledge, but in the relation of each type of knowledge to the society and the culture within which each is embedded. The fundamental differences in these relationships will have to be addressed by the Institute.

To look at these relationships it may be helpful to think of the underlying structure of indigenous and so-called "western" societies in the 1990's.

Any group of people living together that organizes itself to be more effective as a group than the individuals would be if they acted independently must develop a relationship between three basic characteristics of any society:

- its *knowledge*, individual and collective;
- its capacity for the decisions of a few to affect the actions of many (the way it exercises *coercion*, often seen today as management, organizations, marketing);
- its *production*, or ability collectively to meet its needs and wants.

Over the course of human history, three main types or structures of human society have developed and have persisted, each with a different relationship between these major characteristics. These have been called, not very appropriately, *hunter-gatherer societies*, *agrarian societies*, and *industrial societies*.

The structure of each of these kinds of society is distinctive, no matter where in the world the society is found and what kind of political system it has. All three are found, and are strong, in Canada today. Each has a distinctive relationship to knowledge, and to awareness of the environment.

- In *hunter-gatherer societies*, emphasis becomes naturally placed on development of wide and acute powers of observation about the environment at the level of the individual. *Personal knowledge*, of all aspects of the environment and life, based on observation and handed down within the family unit, is dominant.

  Production, based on such knowledge, is tied to immediate needs.

  Coercion is minimal, and is a tool for immediate production and communication of knowledge.
- In *agrarian societies*, humans take advance actions to manipulate natural processes to provide sustained food, tools and wealth. These actions lead to a structured society, with divisions of labour or occupations, to larger and larger units of human action, to accumulation of wealth beyond immediate needs, and the means to control or protect it. *Coercion*, as a means to organize and control production and ensure societal stability, becomes dominant. *Production* becomes a means of ensuring wealth and a focus for coercion. *Knowledge* becomes collective rather than individual, the domain of specialists, and a tool to support coercion and production.
- In *industrial societies* the effort becomes focused on use of a developing technology to use the material processes and energies of nature to accumulate wealth and influence;the social system becomes geared to competitive increase of output. *Production* becomes dominant,and often a goal in itself. *Coercion*, through organization, management, marketing, based on information and economic units,is justified as a means to serve production. *Knowledge* becomes mainly technological rather than conceptual, collective rather than individual, with a mostly utilitarian view of nature and environment.

Today, most of the industrially developed world has an agrarian government structure inherited from pre-industrial days. Most citizens expect law and order (through coercion) to be provided by a central authority (the government) and want and expect to be coerced into equitable use of resources, protection of the environment etc. We agree, collectively, to pay with our production to keep the control system working and dominant. A prime example of the agrarian instrument of coercion is the Goose Bay airport and the Low Level Flying Training Programme, whose ultimate purpose is not to increase production or individual knowledge but to secure collective peace for society. Almost all the knowledge and research that the Institute is engaged in has as its objective the accommodation or maintenance of this coercion instrument.

However, the economic and production system in which most Canadians live is not structured in the agrarian system, but is an industrial societal structure, where the emphasis is on continued innovation, competition, and increased production and not on maintenance of stability and control. There are examples all about us, all the time, of the tension or conflict between an inherited agrarian government control system that seeks stability, and which is slow to adapt to new situations, and a volatile competitive industrial societal system that rewards aggressiveness and seeks to exploit opportunities or explore new directions. Both the agrarian and industrial systems separate humans from the non-human natural world, and the knowledge and research related to the environment and natural resources is utilitarian or instrumental.

At the same time, interspersed with and alongside these societal systems, in many countries and particularly in this part of Canada, there are strong components of a hunter-gatherer society, in which personal knowledge and experience — or, in the electronic internet version, personal access to an endless store of knowledge — dominates, and where decisions are made close to the problem or situation with a minimum of organized structure. It is this societal system into which "naturalized" knowledge as we have been discussing it here fits.

While the Innu are quite correct in stating that over centuries they have needed their environmental knowledge to survive and have a good life, and that such knowledge, accumulated through generations of experiment and experience, has included a need to constrain or adapt their human activities in order to maintain the productivity of the environment for the future, it is also true that the knowledge and the skills represented by the Low Level Flying Training programme is considered by western societies and governments to be essential for their protection and survival, and in this sophisticated flying operation program we see the modern expression of accumulated experience of several thousand years of warfare which, for better or for worse, has been an essential part of western civilizations.

So we have here in Labrador the issue of the use of knowledge, of research and learning, to serve two different but over-lapping goals. We have the task of developing the knowledge base for carrying on activities considered important to the survival of modern agrarian-industrial society, and at the same time ensuring the economic and cultural survival of a diverse group of hunter-gatherer societies to whom a healthy natural environment is central. Our workshop, and the future work of the IEMR, is, when one comes down to it, to explore the contacts between, and the fits and mis-fits, of knowledge and research that is accumulated to support on the one hand the organization and control of the agrarian government system and the operations of advanced industrial technology to reinforce that control system, and on the other hand the accumulated perceptions and wisdom of traditional ecological knowledge. Out of that exploration and exchange of knowledge should come, we all hope, a better understanding of the ecosystems of central Labrador and Nouveau Quebec, and of their importance not only locally but nationally and to the global system; examples and an appreciation of accommodation between military objectives and the concerns of the resident people; increased healthy interchange and sharing of knowledge between various indigenous groups; and a new respect for the knowledge systems, the ways of life, the goals, and the feelings of a wide range of peoples, from military planners to biological researchers to caribou hunters who otherwise would not be in contract with one another.

SUMMARY — WHERE ARE WE NOW?

Our task this morning is to think about how the Institute for Environmental Monitoring and Research can help both systems of knowledge to be used to meet the objectives and the concerns of the low level flying programme — which is an important objective of our governments and of the agrarian-industrial system of our country —, and also to meet the concerns of the people who live in the area of low flying, who have legitimate fear that the natural environment and ecosystems, upon which as hunter-gatherers they are dependent on for material and spiritual sustenance, will be adversely affected.

At our present stage of understanding, it would appear that IEMR research on:

- what elements of the environment or ecosystems of the area are or may be disturbed or affected over a season or a few years:— draws from both systems of knowledge;
- the quantification of biological changes and identification of specific effects: the responsibility of western scientific study;
- integrated knowledge of trends, synergistic effects and behavioral changes: provided mostly by traditional or naturalized knowledge;
- assessment of causes, internal to the region: both systems, but traditional naturalized knowledge is especially valuable;
- assessment of causes, external to the region: mostly from western scientific studies;
- effects of changes, or of fear of changes, on the people in the area: both knowledge systems.
- effects on human rights and freedoms: in this issue, mostly from indigenous knowledge, but to protect these is the stated purpose of the low level flying training program itself.

Can the two systems work together? Yes; both are means of learning about the environment and natural resources, but each is set in its own cultural context.An important area of working together, at present not as well developed as perhaps it should be, is the involvement of traditional naturalized knowledge and concerns in the formulation of research questions and the design of research projects which will then be carried out by "western" scientists. It happens often that western scientists formulate the questions and the project, do the work, and after it is done the results are found not to answer very well the concerns of the indigenous people that the researches were ostensibly intended to address. Again and again, indigenous people ask to be involved early in the selection of research topics and design of research programmes.

Can the two systems be integrated or amalgamated? This appears to be useful or possible only at the level of descriptive observations. At the level of the meaning or consequences for humans, the two knowledge systems seem often to be distinct and they may not agree. This difference may be particularly true when the results of research lead to forecasts or outlooks that are not economically, ecologically, or culturally pleasant.

Can persons from one knowledge system learn the other system? It happens frequently, and increasingly, that persons with an indigenous science background, through "western" study and training, can become expert in and fully involved in "western" science. But to move in the reverse direction is very difficult for non-indigenous persons. Much can be accomplished, not so much by exchanging knowledge or facts, but by learning to respect and accept the cultural values and goals of the other system.

Can the Institute use and foster both systems? It must.

Jean Huot
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Summary of Plenary Session

Report on plenary discussion,based on reports from the four working groups which met to discuss the question: "How can both systems of knowledge be used in the research projects of the Institute?"

After identifying some of the differences between the two systems of knowledge the three discussion groups examined different approaches to use both systems. The following points were addressed by each group.

Facilitators for the plenary session: Louis LaPierre and Guy Bellefleur

IDENTIFICATION OF DIFFERENCES AND ADVANTAGES OF EACH SYSTEM

Western scientific knowledge (WSK) addresses short term questions and uses quantitative data collected over a short period of time. It analyses information over a large geographical scale and is good at solving technical problems or providing habitat mapping. Traditional ecological knowledge (TEK) is more qualitative and its basis is local, however it considers long time perspectives. It is useful to detect changes in environment and is a good source of hypotheses. It aims at developing understanding and wisdom in relation to the animals and the land.

BOTH SYSTEMS MUST BE USED BUT THIS REQUIRES CHANGES IN ATTITUDES FROM WESTERN SCIENTISTS AND INTEGRITY OF EACH SYSTEM MUST BE MAINTAINED

Because of those differences both systems must be used, however for the western scientist this requires time and additional efforts. Often, studies must proceed rapidly due to the animal seasonal life cycle, budget constraints and field methodology. It is important that western scientists realise at the early stage of planning that TEK must be taken into account. Although both systems of knowledge must contribute to the research it is important to maintain the integrity and individuality of each system. For that reason one must be cautious concerning the form of combination of those systems, to preserve the advantages of each one.

DIFFERENT DEGREES AND TYPES OF COOPERATION BETWEEN BOTH SYSTEMS ARE EXAMINED

1) Parallel and isolated processes on same issues with few contacts
2) Parallel processes with occasional contacts
3) Fully integrated process.

The first approach has been common in the past and co-operation is minimal. Often the research does not address the concerns of the local people and provides little or no information to the community.

The third approach risks to affect the integrity and individuality of each system and to reduce their individual advantages. Because of the differences in approaches, scales, methodology , data bases and, often, objectives integration or incorporation of both systems might not be desirable.

The second approach appears the most likely to provide positive results. The contacts must happen at the critical times of the research. Concerns of the community must be addressed in hypotheses of western research, information must be shared during the research by both systems and results must be presented locally at the end in such a form that they can be discussed and commented in view of TEK.

WESTERN SCIENTISTS MUST TAKE INTO ACCOUNT CONCERNS OF TEK IN RELATION TO THEIR METHODOLOGY

Western scientists must be respectful of the people, the animals and the land were they conduct their research. Their methods must follow ethical guidelines that respect the traditional views of the animals and the land and select their methods to reduce effects on land and animals.

PART 5 WHAT SHOULD BE INCLUDED IN THE ETHICAL GUIDELINES OF THE INSTITUTE REGARDING THE RESEARCH OBJECTIVES, METHODS, FINDINGS AND THEIR INTERPRETATION, AND PUBLICATION?

Maura Hanrahan
Institute for Environmental Monitoring and Research

Summary of Plenary Session

Report on plenary discussion, based on reports from the four working groups which met to discuss the question: "What should be included in the ethical guidelines of the Institute regarding the research objectives, methods, findings and their interpretation, and publication?"

After Mr. Russell and Mr. Parker introduced the topic, participants divided into three smaller groups for discussion purposes. Each group had a facilitator and a reporter who presented a summary of each discussion during the plenary session, which immediately followed.

The session was facilitated by Todd Russell and Gerry Parker

Group 1

Reporter: Jean Huot

This group reworded the question to ask, what is right and wrong in relation to community and in relation to the land? Any guidelines that are developed should be tools steering towards stated goals and objectives. The principles of humility, honesty, responsibility, respect, and accountability should apply to all stages of a research project.

Group 1 envisions a very active Board. Scientists doing research should be accountable to the Institute, its Board, and the organizations it represents. The Board should be responsible for obtaining consent; that is, the appropriate member should obtain community and individual consent.

Researchers themselves should be expected to provide answers to the following questions: why the research is being conducted, what is its purpose, and how will it be used. This is the only way the researcher can earn respect from the community.

Group 1 also began the discussion focused on what models will be used in research (i.e. Western or naturalized [TEK]). Participants said that more discussion on this topic was needed.

Group 2

Reporter: Stas Olpinski

This group felt that mutual benefit is critical for the researcher, and the resources being studied. It is also important that research has no adverse impacts.

Privacy and anonymity were seen as crucial, as was information about the distribution and use of the research results.

Group members said that guidelines must be applicable and appropriate right across the board, whether the studies are western or naturalized in origin. There must be a level playing field and parity at all stages: prioritization, conceptualization, research design, implementation, data analysis, report production, and any decision-making that flows out of research.

This group, too, emphasized honesty. There must be a clear understanding of such questions as what the research is about and why it is being done. This follows from the principle of respect.

Group 2 tried to determine ways of putting this into practice. They suggested a contractual arrangement reflecting a commitment between researchers and the Board. The contract would cover definitions of participants, costs, researchers' salaries, and the use of results.

The group discussed a variety of problematic issues that might come in the course of the Institute's work. One is confidentiality and the training of graduate students who need to publish as part of their degree requirements. This should be reviewed on a case by case basis.

Another issue concerning joint funding with bodies such as NSERC. How is publication to be dealt with in these cases? It is more difficult than with consultants who are performing a service for a fee.

Breach of contract was also discussed. Obviously, this situation could be grave. It could be dealt with through termination of contract or through a review of the situation followed by appropriate steps. There must be reciprocity; this applies to scientists and members of the community.

Group members recommended that the Institute conduct a search for other existing guidelines.

Group 3

Reporter: Randy Edmunds

He noted that this group had a large number of aboriginal participants. Members reworded the question to ask, what can you do and not do regarding research?

Researchers should realize that young people are not the most accurate source of traditional ecological knowledge. Young people are somewhat westernized and have to be taught respect for the land and respect for their elders.

Timing is important. Researchers should become familiar with seasonal land use and occupancy to make sure they carry out their studies when it is appropriate and convenient for aboriginal people.

Once naturalized knowledge is in the system, it still belongs to aboriginal people. This should be reflected in the way research is used.

Some group members reiterate their doubts about western science, specifically whether it could really use TEK and the wisdom of aboriginal people.

There was disapproval of scientists using research as a stepping stone in their careers and presenting themselves as experts.

The setting for discussions, interviews, etc. should be chosen by aboriginal people. Throughout research projects, there should be respect for people's privacy and their livelihood. In the past there have been incidences when this was not the case.Researchers must be aware of cultural differences and, subsequently, use caution as they go about their work.

There is a need to review low level flying from the position of traditional ecological knowledge. Both groups (aboriginal people and western scientists) must be equal participants in decisions about the availability of study results and the forms they are presented in.

Finally, there should be built-in benefits to those involved, especially aboriginal people. For example, it was reported that many elders would like to see their knowledge incorporated into the education system.

Comments on the Workshop From the Participants

At the end of the Workshop, the participants were asked whether the objectives of the Workshop were met. Here are some of the comments we received:

- A good start in overcoming the real or imagined barriers,misunderstanding and mistrust between TEK and SEK. Provided a forum for *all* to express frustrations and concerns. Need more of the same! Congratulations to organizers.
- Ensure that Respect — Equity and Empowerment are kept in mind.

  In future projects — western science may be more interested in the process. As a means of R.E.E. — small projects that will benefit aboriginal people should be done — Equity of project shall be native knowledge — Scientific financial backing — Empowerment — allow the aboriginal (people) to do it their way — allow it to be theirs.
- I have been to very many (very, very, many) workshops/conferences addressing the issues of Traditional Knowledge and Western Science. In all honesty — this has been the most open and the most successful of them all. I felt a real feeling that the Institute wants to "do it right." So congratulations on a healthy first — but important — step.
- The answer is Yes. This was a good first step in the right direction. However, everybody should keep in mind that respect is an important keyword.
- In general I feel that the conference was well—implemented, organized and conducted — a very impressive, knowledgeable, and diverse crowd of people were brought together to discuss difficult issues (perhaps for the first time?). Progress was made towards the workshop's objectives, and as acknowledged, this is merely a beginning to a long journey ahead. Hopefully we will continue to promote and develop trust and understanding amongst these groups.

  Suggestions for future workshops: smoother translation, more inclusion of aboriginal people in the structure and organization, and more input from women.
- Opened the door to cooperation and more mutual respect. Fascinating material covered!
- I think the workshop helped us a lot.
- Yes, the conference was very useful. It has brought out the concerns of both aboriginal and western science. Also it showed that both *can* work together in a friendly and useful manner.
- The conference was a worthwhile learning experience.

  I hope things brought forth will be acted upon and not be put on a shelf to collect dust.

  Other conferences like this should be held on a regular basis.

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- The working group sessions were not long enough.
- The conference was very useful in that it represents a step in the right direction.

  I still think that many of the scientists don't understand native culture and many natives don't understand science.

  This has to change in order for trust to develop.
- Yes. It is a first step to recognise the aboriginal knowledge.
- Yes. The workshop brought out a lot of ideas, and seemed to be carried out in a spirit of willingness to cooperate.

  There seems to be momentum now that must be sustained so that we all don't slip back into our former ways.
- Right: concept, selection of attendees, comradery and spirit

  Problem: agenda too full — not enough time for cross-cultural discussion, not enough attention to the load on the translators (they were barely acknowledged), not enough young people, and translating equipment often faulty.

  Suggestions: more displays.
- I think it is a stepping stone to a better overall understanding of our values on our land. For all groups, Innu, Inuit, and western scientists.

  Perhaps more meetings are (required) in order to recognize the needs of and objectives of the Innu, Inuit and Western Scientists. It was both wonderful to see all 3 groups work together.
- It was a good beginning on a difficult topic.

  Invited speakers did a great job.
- Good interaction and good will.
- I learned much from this workshop. It was very interesting and informative.

  I was very pleased to see different groups of people sharing their ideas and thoughts with each other.

  I am sure a lot will be accomplished from this workshop.
- Yes, the workshop was largely a success. I particularly enjoyed the range and diversity of invited speakers, interspersed with group discussions. A couple of suggestions (because often the most productive and interesting discussions occur in informal settings): the size of the discussion groups be reduced (and the number of groups increased to allow for more individual participation); and, that coffee breaks number and length be increased.
- We needed to briefly reference some of the work previously done on these issues — i.e. — ethical principles; studies already done that incorporate TEK. Otherwise, good conference, *But*, it is only a start.
- Workshop was very valuable with many good presentations and provocative discussions.

  It was an important "first step" however, it is critical that there be appropriate follow up and continuation on this subject to implement suggestions or recommendations.
- The workshop met the objectives of bringing the two knowledges/approaches together and familiarizing each group with the other. In summary, it was an excellent introduction;a good beginning. Future such workshops should be more focused with less presentation, more discussion and a much less ambitious schedule. By the time the end of the day (or night) comes, fatigue begins to set in and productivity (or even interest) decreases.

- The logistics and organization were very well done.

  I was particularly impressed with the participation of all aboriginal groups.

- In essence the conference did meet certain objectives or expectations that I had.

  The conference allowed for the opportunity to share different knowledge (Aboriginal/non-Aboriginal, Western, etc.) in an open way and with respect.

  The workshop did promote an understanding of the different knowledge systems and the need to respect and allow those knowledge systems to be a part of the Institute's work.

- Still more interested in seeing such a venture operate successfully.

- The conference was a good exchange and I will remember it for a long (time).

  I wish the Institute (the) best of luck in their endeavours concerning further exchange of western and traditional knowledge.

  An ongoing exchange is needed to further each other's learning of the eco-environment of Labrador and Quebec.

- The conference was a wonderful occasion to start building up trust — and develop mutual understanding.

- It was a good start!

  It was good to hear from other indigenous people about their knowledge.

  It is hard for us to give opinions about an unfinished product. When a report is done and how much of what was being said will be implemented, are the questions we have.

  If and when we see this, then we can give an honest opinion.

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