TRADITIONAL ECOLOGICAL KNOWLEDGE HANDBOOK:

A TRAINING MANUAL AND REFERENCE GUIDE FOR DESIGNING, CONDUCTING, AND PARTICIPATING IN RESEARCH PROJECTS USING TRADITIONAL ECOLOGICAL KNOWLEDGE

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Funded by the *Exxon Valdez* Oil Spill Trustee Council as part of Restoration Project 97052B

An earlier version of this publication was reviewed by one or more qualified peer reviewers as part of the *Exxon Valdez* Oil Spill Trustee Council restoration program. However, not all peer review comments have been addressed in this publication.

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FOREWORD

Since the beginning of time, the Alaska Natives have relied upon the land and sea for their sustenance. The vast knowledge of the natural resources and environment that has been gained through the traditional harvests of fish and game and interaction with the environment has been passed from generation to generation and is a major component of the Native culture. This knowledge is not just limited to common knowledge of the resources, but includes specific details related to the condition of many of the different resources and how these conditions may have changed over the years. In order to fully assess the damages created by the oil spill, a comparison of conditions prior to and following the spill must be made. Western scientific research will provide the necessary information regarding the present condition of the resources; traditional knowledge of the Native Community can provide detailed information on conditions in the years prior to the spill.

The Traditional Ecological Knowledge project has provided the opportunity for the scientists and researchers to compare the results of their research with the traditional knowledge that exists in the Native Community. The integration of the two into on complimentary process will benefit not just today's generation, but will be for the good of future generations.

Gary Kompkoff

President, Tatitlek Village IRA Council

ACKNOWLEDGEMENTS

Thanks are due to Melanie Bosch, Patty Brown-Schwalenberg, Don Callaway, Maria Fernandez-Gimenez, Carl Hild, Henry Huntington, Sandra Schubert, Hugh Short, Claudia Slater, Joe Sullivan, and the residents of the communities of the Chugach Region, especially those of Chenega Bay, Tatitlek, Port Graham and Nanwalek.

PREFACE

This handbook has been produced as part of the Traditional Ecological Knowledge (TEK) project, funded by the *Exxon Valdez* Oil Spill (EVOS) Trustee Council (restoration project /052B). The project was designed to make optimal use of the complementary nature of scientific data and traditional knowledge, while increasing the involvement of spill area communities in oil spill restoration.

People living in the spill area have detailed knowledge about the condition of resources, which can add to data collected as part of scientific studies and may enhance the success of the restoration effort. This includes knowledge of the historic population sizes and ranges of many of the species injured by the spill, as well as observations concerning the diet, behavior and inter-relationships of injured species. This information can help researchers evaluate the injury and recovery status of these species.

Through the efforts of the Community Involvement and Use of Traditional Knowledge project, and the TEK project (EVOS Restoration Projects /052 and /052B, respectively), there has been much progress in making EVOS project principal investigators aware of the availability and value of traditional ecological knowledge. TEK was a major theme of the annual Restoration Science Workshop in January 1996.

The current project builds upon this foundation. In federal fiscal year 1998, this project continues the EVOS Trustee Council's initiative to enhance community involvement in the restoration program through the application of TEK in Trustee Council-funded projects. There are three primary tasks, including: (1) Providing assistance in data collection, analysis, and interpretation (continue working with EVOS project principal investigators to develop appropriate ways to apply TEK in ongoing and potential projects); (2) Synthesis workshops

(organizing focused discussions between principal investigators and community experts to develop substantive interactions about restoration research findings and TEK); and (3) Community assistance (building understanding of the benefits and implications of research on TEK in local communities).

The project funds a TEK Specialist to: (1) serve as a contact point for spill area communities, the community facilitators and spill area wide coordinator hired under Project /052A, and principal investigators on issues related to TEK, (2) provide technical assistance to restoration project principal investigators who plan to use, or for whom it would be appropriate to use, TEK; (3) review FY 99 work plan to identify restoration projects that may benefit from a TEK component, (4) consult regularly with the TEK Advisory Group, and (5) organize and coordinate synthesis workshops between project principal investigators and community experts.

This handbook is intended for use as a tool by the TEK Specialist, EVOS project principal investigators, and community residents in the effort to meaningfully bring TEK into the EVOS restoration effort.

INTRODUCTION

This handbook provides guidance to community involvement facilitators and others who may serve as local research assistants for *Exxon Valdez* oil spill restoration projects that have a traditional ecological knowledge (TEK) component. The handbook also provides information and suggestions for principal investigators who would like to include TEK in their research. It is intended that this handbook be updated as local researchers and principal investigators gain experience in collecting and using TEK.

The approach in this handbook is based on social science methods in general, and anthropological methods in particular. We suggest that the collection and use of TEK in restoration projects will be advanced if EVOS researchers, both local and non-local, learn and follow some basic procedures that are used by social scientists to collect information about subsistence uses and other activities in rural Alaskan communities.

An important principle in science is that <u>how</u> you know something is often just as important as <u>what</u> you know. For example, if you visit a village and want to learn where seals can be found and how abundant they are, you could just ask the first person you see and then go look where they tell you to look. However, it's more likely that you'd first ask around to find out who the seal hunters are. You'd want to know something about the hunters: how long they've lived in the community, how frequently they hunt, how others view their skills as hunters. All these factors would help you evaluate the information you are collecting. You might discover

that there are differences of opinion, so you could dig deeper, or encourage discussions among experts to clear up points of confusion. If you use these methods, you will leave the community with confidence that you have learned something about seals.

The same is true when a scientist asks you a question, or asks for your help in getting a question answered. The scientist will not only want an answer to the question, but will also want to know how you know the answer. This may appear disrespectful or rude, but when you think about it, examining the source of your information, and seeking alternative answers, is how people in villages learn about subsistence and other cultural activities. You place more confidence in the teachings of a respected elder than that of a younger person with less experience. You will be more successful if you learn from a skilled hunter than from one with little experience or knowledge. Subsistence activities can be dangerous, so you are going to want to know something about your teacher, and you will want to test what you are taught. It's the same with science: asking questions and testing answers is how understanding is reached.

Because of the importance of being able to explain how you know something as well as what you know, this handbook places an emphasis on record keeping. Types of records include notes, journals, reports, maps, video and audio tapes, and photographs. Keeping good records requires being aware of and writing down such things as dates, locations, identity of sources, and context.

The handbook describes various ways to gather information systematically so that others can understand, use, and evaluate it. These methods include:

⇒ **interviewing** "key respondents," or people who are especially knowledgeable about a topic. For some topics, there might be just one acknowledged expert, while in other cases, several people might offer various ideas and observations on the subject.

⇒ conducting a systematic **survey** to get a range of information and responses, using either a set of open-ended questions (a "protocol") for discussion, or a more formal written set of questions with more directed responses (a "questionnaire"). These methods are appropriate when you need to talk to a "sample" or selection of people or households.

⇒ **holding meetings** in which a **number of experts** are present and discuss a topic in depth. This is a good way to explore the range of knowledge and experience in a community, identify different points of view, and if appropriate, reach consensus.

⇒ investigating archives, data bases, and other written materials. If a topic has been studied by someone else, it is a good idea to **study their material** before-hand. This may give you insights on questions to ask. It also provides time-depth.

⇒ **observing** during field visits to communities, **participating** in subsistence and other activities, and visiting sites with knowledgeable people.

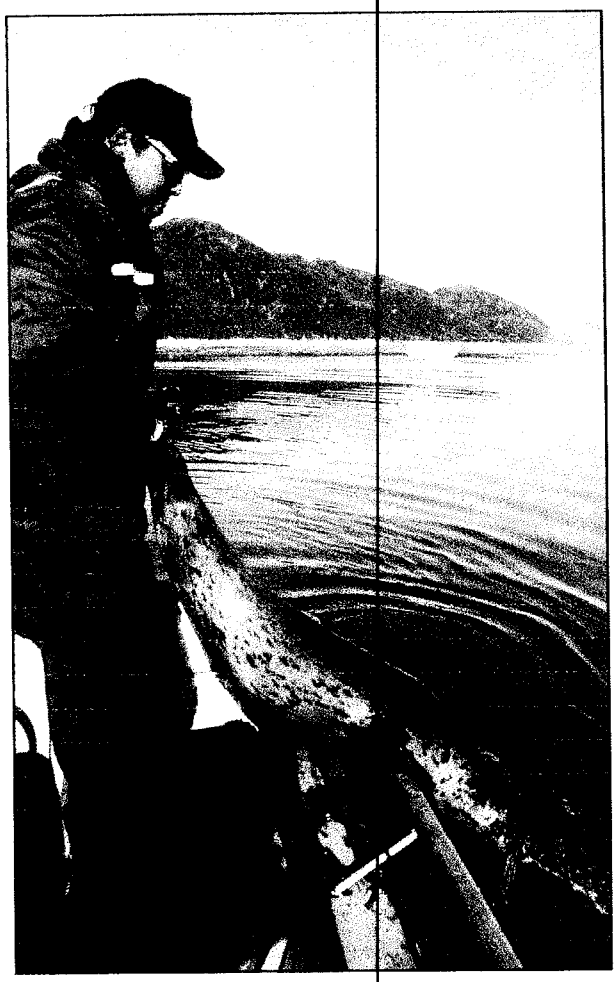
The handbook also describes the use of data gathering tools and visual aids to productive interviewing. Data gathering and recording tools include notebooks, calendars, tape recorders, still cameras, video cameras, and computers. Visual aids, which are also helpful in gathering data, include maps, artifacts, and photographs.

The handbook is intended as an introduction; the bibliography suggests additional readings on various topic areas. Before beginning the overview of research methods, the handbook first reviews several topics related to research ethics. Anyone involved in gathering information from and about people is wise to consider these topics before they begin their work.

WHAT IS TRADITIONAL ECOLOGICAL KNOWLEDGE?

Julian T. Inglis, Executive Director of the International Program on Traditional Ecological Knowledge at the Canadian Museum of Nature provides the following definition of TEK:

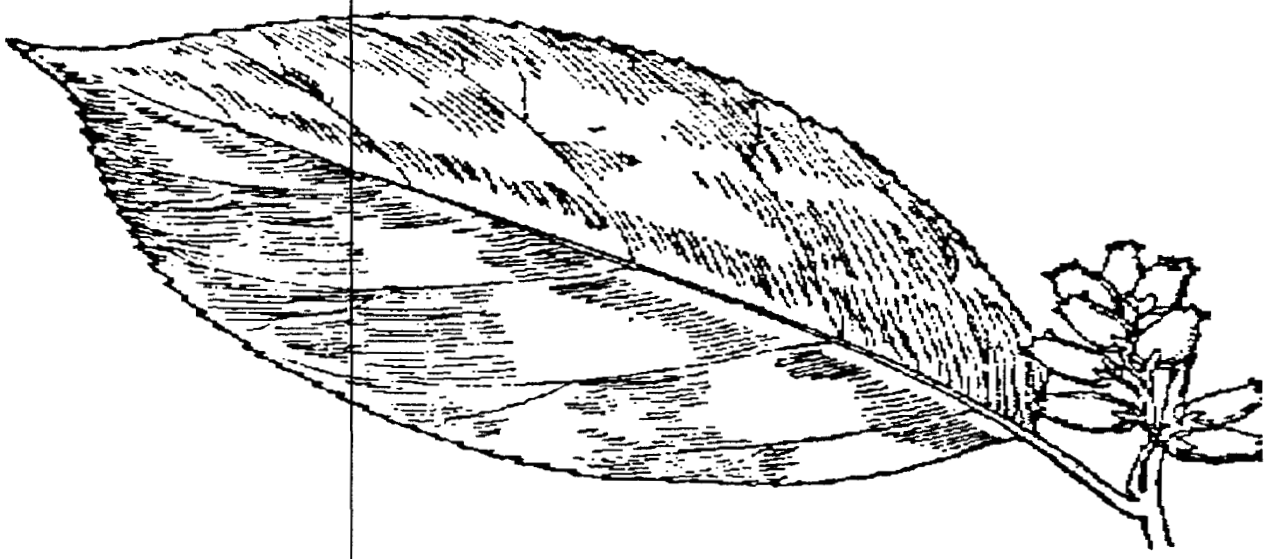
> TEK refers to the knowledge base acquired by indigenous and local peoples over many hundreds of years through direct contact with the environment. It includes an intimate and detailed knowledge of plants, animals, and natural phenomena, the development and use of appropriate technologies for hunting, fishing, trapping, agriculture, and forestry, and a holistic knowledge, or "world view" which parallels the scientific discipline of ecology (Inglis, 1993: vi).



There is currently much debate over what should be labelled traditional ecological knowledge, and what should more properly be called indigenous knowledge, local knowledge, or experiential knowledge (for a good discussion of these various terms, see Stevenson, 1996). For the sake of simplicity, we are here using the term TEK in its most inclusive sense to embrace all of these categories of knowledge.

Traditional knowledge generally refers to the knowledge collectively possessed by a people which has been accumulated through time and passed down from generation to generation. It should be remembered that even though we do not discuss them separately, the knowledge fishermen have of their fishing grounds (local knowledge), and the knowledge a hunter has accumulated through a lifetime spent hunting in a given area (experiential knowledge), are also useful to the restoration process. These other kinds of knowledge can also be brought into the restoration process using the techniques described in this manual.

TEK is more than useful facts possessed by local people; it is a knowledge system in its own right. It is important to understand the social and cultural embeddedness of TEK. Some TEK may not be accessed simply by asking questions. It may be contained in stories and reflected in resource management practices.



CASE STUDY #1

AN EXAMPLE OF THE PRACTICAL USE OF TRADITIONAL ECOLOGICAL KNOWLEDGE: TRADITIONAL USE OF NEEM BIO-PESTICIDES

Although traditional pest control systems were once widely used in tropical countries, their use has been severely disrupted by the introduction of modern agro-chemicals. This dependence on expensive modern pesticides, apart from posing a potential threat to the health of the poor traditional farmer, is often poisonous to the local ecosystem.

Throughout India and Africa, traditional farmers have known about the insecticidal properties of the neem tree for centuries. In Niger and Mali, farmers have long observed the immunity of its leaves to desert locust attack. Although not as powerful as synthetic ingredients, the neem extract contains 20 active ingredients, which makes it difficult for any insect pest to develop a resistance to them all.

Some farmers in India and Africa are using scientific assistance to develop a neem spray made from the seeds of the fruit. It works as a repellent and anifeedant to many chewing and sucking insect pests in the larva or adult stages, including desert and migratory locusts, rice and maize borers, pulse beetles, and rice weevils. It also upsets the insect's hormone balance so that it becomes permanently incapacitated.

Indigenous farmers in north-western Mali place leaves of the neem tree under the millet heads when they lay them on the ground to dry. This practice discourages insect infestation. A project funded by USAID recently brought together a team of entomologists and social scientists from Niger and the University of Minnesota to promote the exchange of indigenous knowledge on the uses of neem products in improving the sustainability of traditional agriculture in Niger.

Chemists in 1988 determined the chemical structure of the neem tree extract, azadirachtin. Currently, over a dozen companies in industrialized countries are working on commercial neem products. In 1983, the American Environmental Protection Agency registered a commercial neem pesticide for marketing under the name "Margosan-O". Efforts are on-going to discover a chemically modified version of azadirachtin that is stable and as effective as naturally occurring neem.

Adapted from Lalonde in Inglis, 1993.

Traditional knowledge is complementary to western science, not a replacement for it. There are both similarities and differences between these two ways of knowing. The following table lists ways in which traditional ecological knowledge and scientific ecological knowledge differ, as well as ways in which these two systems of knowledge complement one another.

Traditional Ecological Knowledge	Scientific Ecological Knowledge
Mainly qualitatitive (based more on other kinds of observations than on numbers or statistics)	Mainly quantitative (based on numbers and statistics more than other kinds of observations)
Partly based on feelings and instincts	Based on logic
Views nature as more than the sum of its parts and includes a spiritual aspect	Tends to explain nature with the same sorts of laws used by chemists and physicists. Specifically excludes a spiritual aspect.
Mind and matter are considered together	Mind and matter separated
Includes moral values	Ideally value free
Based on observations & accumulation of facts by trial and error	Systematic, deliberate accumulation of fact through experimentation
Based on data generated by resource users themselves	Based on data generated by specialized researchers
Based on long time-series information on one locality (diachronic data)	Based on short time-series information over a large area (synchronic data)
Does not try to control nature	Tries to control nature to benefit specific human interests
Primarily concerned with local interest and needs	Concerned with principles of general interest and applicability
The above are generalizations, and there are exceptions. Traditional ecological knowledge can be quantitative; scientific ecology can and often does use holistic approaches, and sometimes produces diachronic data.	

Another way traditional ecological knowledge may be distinguished from scientific ecology concerns the social context of traditional ecological knowledge. Traditional ecological knowledge is not just a system of knowledge and practice; it is an integrated system of knowledge, practice and beliefs. The social context of traditional ecological knowledge includes the following aspects:

1. Symbolic meaning through oral history, place names and spiritual relationships.
2. A distinct world view; including a view of the environment different from that of western science.
3. Relationships based on sharing and obligations toward other community members and other beings, and community resource management based on shared knowledge and meaning.

Adapted from Berkes in Inglis, 1993: 4.

Despite the differences, traditional ecological knowledge and scientific ecological knowledge do have much in common, a fact that is often overlooked.

> Concepts like traditional knowledge and ethnoecology can easily be mystified as a kind of undefinable wisdom of "natural peoples", long lost for urban westerners. In real life though, the difference between traditional and scientific knowledge is not that great. Freeman (1985) argues that both types of knowledge rest on the systematic gathering of empirical observations. The main difference lies in the methods used for collection and analysis of data. Scientific knowledge needs a wide range of methodical observations to establish a model of a situation, for instance to estimate the development of a certain stock of animals within an ecosystem. Before a biologist can come to a conclusion about the development of the stock, he must collect great amounts of quantitative data over some time. A local fisherman, who is familiar with the area, will react spontaneously to observations that deviate from the usual pattern. He will be observant to qualitative changes, signs which indicate that something unusual is happening. He will interpret such signs within the context of his experience and traditional knowledge, and discuss his interpretations with fellow fishermen and neighbors.
>
> From this standpoint there is no need for a contradiction between traditional knowledge and scientific knowledge. The two types of knowledge should be complementary, and resource managers would gain from using both types as a basis for management regimes (Eythorsson in Inglis, 1993: 134).

Local, indigenous people have a special relationship with their environment, by virtue of their intimate, long-term connection with the land, plants and animals. This means they can have much to contribute to any study that involves the local ecosystem, such as the EVOS restoration process. In the words of Chief Robert Wavey of the Fox Lake First Nation in Manitoba, Canada:

> As indigenous people, we spend a great deal of our time, through all seasons of the year, travelling over, drinking, eating, smelling and living with the ecological system which surrounds us. Aboriginal people often notice very minor changes in quality, odour and vitality long before it becomes obvious to government enforcement agencies, scientists or other observers of the same ecological system.
>
> Governments have begun to view indigenous people and their knowledge of the land as an early warning system for environmental changes, perhaps in much the same way as miners once viewed canaries. The difference is that a canary does not know why it died, or what was wrong; indigenous people do. The canary cannot propose solutions or provide an example of lifestyles and ethics to restore ecological balance; indigenous people can. The canary does not foretell environmental change, but indigenous people accurately predict ecological

disturbance, based on multi-generational accumulations of knowledge and experience (Wavey in Inglis, 1993: 12).

The box on the next page contains a list of some of the practical ways that TEK research can contribute to EVOS restoration and other environmental and ecological undertakings.

It is important that researchers trying to work with TEK recognize and acknowledge its value to the restoration process.

Nakashima (in Inglis, 1993: 100) points out that in many cases where traditional knowledge is recognized as important, wildlife managers do not accord it the same respect as science. He criticizes one researcher (Stirling, 1990:iii) for writing about "combining traditional and modern approaches", but at the same time describing the need for extensive scientific training for Native peoples, without any mention of the need for a reciprocal flow of knowledge from Native experts to wildlife scientists. Nakashima sees this as suggesting that the burden of integrating indigenous and western knowledge is to be borne by native individuals and communities, and is not to be shared by scientists and managers.

The task of bringing TEK into the EVOS process must be carried out in a spirit of cooperation and mutual respect.

THE PRACTICAL SIGNIFICANCE OF TRADITIONAL ECOLOGICAL KNOWLEDGE

The preservation of traditional ecological knowledge is important to community residents for social and cultural reasons. There are other reasons traditional ecological knowledge is important. The following list is adapted from the IUCN Programme on Traditional Knowledge for Conservation (IUCN 1986):

1. Biological and ecological insights. New scientific knowledge can be gained from the study of traditional environmental knowledge systems.
2. Resource management. Much traditional knowledge is relevant for natural resource management. "Rules of thumb" developed by ancient resource managers and enforced by social and cultural means, are in many ways as good as Western scientific prescriptions.
3. Protected areas and conservation education. Protected areas may be set up to allow communities to continue traditional lifestyles, with the benefits of conservation accruing to them. Where the local community jointly manages such an area, the use of traditional knowledge for conservation education is likely to be very effective.
4. Development planning. The use of traditional knowledge may benefit agencies in providing more realistic evaluations of environment, natural resources and production systems. Involvement of the local people in the planning process improves the chance of success of development.
5. Environmental assessment. People who are dependent on local resources for their livelihood are often able to assess the costs and benefits of development better than any evaluator coming from the outside. Their time-tested, in-depth knowledge of the local area is an essential part of any impact assessment.
6. Exposure of mainstream, western society to traditional ecological knowledge can enhance our appreciation of the cultures that hold this knowledge. The recording of such knowledge is also significant as a tool for social change.

Adapted from Berkes in Inglis, 1993: 5.

ETHICAL ISSUES IN CONDUCTING RESEARCH

A set of "Protocols for Including Indigenous Knowledge in the *Exxon Valdez* Oil Spill Restoration Process" (EVOS TEK Protocols, for short) has been worked out between researchers and the communities of the oil spill impact area (attached as Appendix A). The EVOS TEK protocols are intended to serve as a basic set of rules under which EVOS research involving the communities and traditional ecological knowledge are to be conducted. These rules do not go into a lot of detail. The protocol recommends that details of the research, such as ownership of data, participant consent, payment of project participants, participant anonymity or acknowledgment, and community reporting requirements, be negotiated as part of a research agreement between the researcher and the village council, on a case by case basis. This allows the details of how the research is conducted to be worked out according to what the community wants in each specific case. This flexibility means the researchers and village councils can use common sense to determine what they want, rather than having a lot of detailed rules that may or may not apply to a given situation. For example, in many cases, the community may require that residents who participate in the project be paid. However, there may be special cases where the community has asked for a project that the community considers

important, or where only a small amount of time and effort is required of the residents, and the community may decide in that case, payment is not needed. One community may want all respondents on a particular project to be anonymous and their responses to be kept confidential. Another community, participating in the same project, may want all respondents to get credit for the information they provide, even to the point of having their photographs alongside their contribution. With a negotiated research agreement, the community can either get the terms they want from a researcher, or the community can decline to participate in the research.

Three additional sets of ethical principles are provided in the appendices. These aren't intended to replace the EVOS TEK Protocols, but rather to serve as additional guidelines, where they do not contradict them. The "Ethical Principles for the Conduct of Research in the North" (attached as Appendix B) are the guidelines that have been used by the researchers working for the Division of Subsistence, Alaska Department of Fish and Game. The Alaska Federation of Natives has also developed a set of ethical guidelines, on which the EVOS TEK protocols are largely based. (These are attached to the EVOS TEK Protocols, at the end of Appendix A). The National Science Foundation has also produced a set of guidelines, which are attached as Appendix C. In addition, the Alaska Native Science Commission has some community-specific guidelines on file (Inquiries should be addressed to Patricia Cochran or Brian Helmuth at the Alaska Native

Science Commission, 3211 Providence Drive, Anchorage, Alaska 99508, 907-786-7704 or via e-mail at anpac1@uaa.alaska.edu).

One important concept incorporated into each of these sets of ethical principles is that of **informed consent**. Informed consent means that those who might be affected by the research have agreed that the research may proceed, after the research has been fully explained to them.

In seeking informed consent, researchers should clearly identify the sponsors of the research, sources of funding, the people working on the project, and the purpose of the research. Researchers should also explain the potential effects of the research, as well as potential benefits to the community. Informed consent should be obtained from the community as a whole, as well as from each individual participant in the research. At no time should pressure be applied to obtain consent for participation in research (condensed from "Ethical Principles for the Conduct of Research in the North", attached in its entirety as Appendix B).

THEORY AND SCIENCE

The purpose of science is to gather information about the world which is true and useful. It is also important to scientists that if they conducted the same research a second time, the outcome would be the same. That is, science is a process to gain reproducible results. Information is not gathered in a haphazard manner by scientists. Information collection is guided by theory, which is based on a body of knowledge about some aspect of the universe.

There are several types of theory:

Grand Theories

Designed to explain a lot, like the "Theory of Evolution," to explain the diversity of animal and plant life everywhere.

Middle Range Theories

Designed to explain a smaller slice of reality, like the "Theory of Biogeography," to explain the size and distribution of animal and plant populations.

Special Theories

Designed to explain an even smaller slice of reality, like a theory of why the herring population in Prince William Sound crashed in 1993.

Mostly, in the sciences, there are several "grand theories" that are taken for granted as a general frame of reference. Rarely is information collected in a study to support or refute a grand theory. Instead, the grand theory provides ideas and methods which are accepted as basic assumptions by the scientist, and which are used to organize and study a new piece of the world. Usually, information is collected in a study to support or refute particular parts of "middle range

theories". The scientist is attempting to refine the theory, and so improve what the theory can do (Wolfe, 1984).

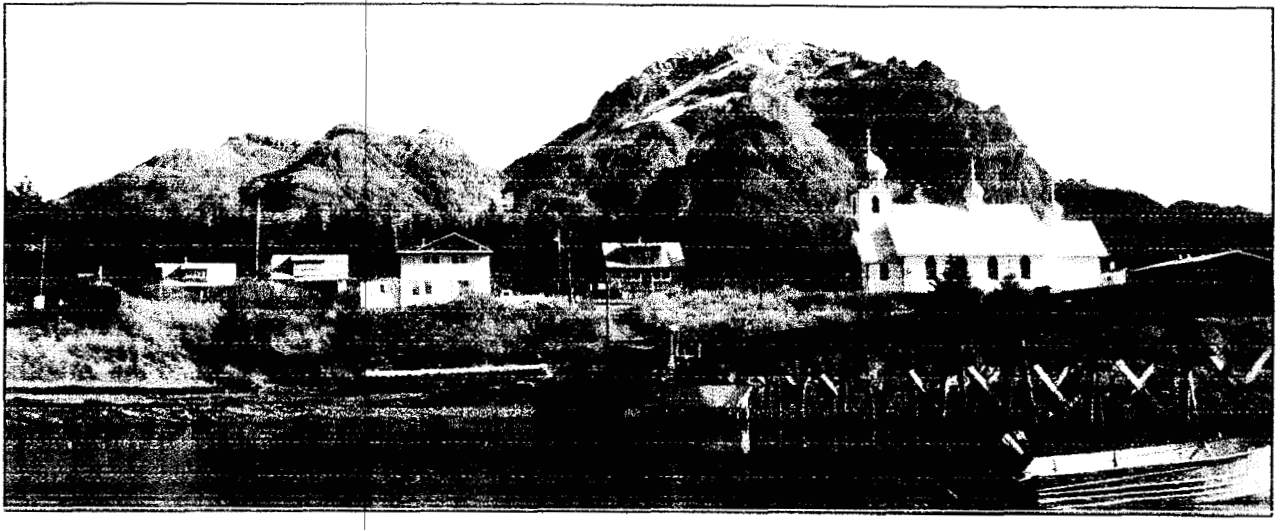
Theories do several things:

1. Describe

2. Explain

3. Predict

Many theories only do the first. They help the scientist precisely describe pieces of the world that are being studied. Some theories give a sense of explanation, an understanding of what is being described. More powerful theories enable a scientist to accurately predict the occurrence of future events.



THE RESEARCH PROCESS

The following table describes steps a researcher follows in doing research using TEK:

Components of the Research Process

I. Develop Hypotheses: What is the question to be answered? This should be decided in consultation with the community.

II. Literature Search: Includes researching what TEK has already been recorded in historical accounts and recent research efforts.

III. Overall research plan: Outlines where you will do your research, how long it will take, and how you will go about gathering data to answer your research questions.

IV. Negotiation of a research agreement: Lays out the rules under which the research will be conducted and reported to funding sources, research institutions and impacted communities.

V. Observation plan for a specific event: Guides how you observe and record information from a specific event, such as a spontaneous conversation, a formal interview, or a planned hunt.

VI. Observation and data recording: The transformation of observations to notes and other forms of information. This recorded information becomes the data upon which conclusions are made.

VII. Rewriting notes: Refining initial notes into clearer and more complete forms.

VIII. Organizing materials: Placing notes and data into an organizational structure, such as topic areas (for example, annual cycle, species categories, activities).

IX. Analyzing data: Sifting, winnowing, compiling, transforming, comparing, testing hypotheses with the data in the organized materials.

X. Writing "sub-reports": Writing sections of the report advancing preliminary descriptions and analyses of the data, as progress reports and summaries, for dissemination to other researchers and for local community review.

XI. Outlining report: Builds on the organization of materials, ordering the material as it will appear in the report, allowing the researcher to explore relationships among components of the research, results and conclusions.

XII. Writing report through several drafts: Refining for clarity and completeness.

XIII. Local and peer review process: Providing an opportunity for community leaders, other community residents, fellow researchers and other interested parties to review the research, including results and conclusions. This process could include public presentations, as well as reports

Adapted from Wolcot, 1994.

CHOOSING A METHOD

Research Methods

Traditional ecological knowledge can be collected in a variety of different ways. Which method, or combination of methods, you choose will depend on what kinds of questions you want to ask.

Key Respondent Interviews

Key respondents are people who are very knowledgeable on a particular topic. In this method, you find out who the most knowledgeable people in the community are on the topic you are trying to study and set up interviews with them. This kind of interview is open and mostly informal, like a conversation. You may prepare a few questions, but since the person you are interviewing is very knowledgeable, you want to give them the opportunity to talk as much as they feel they need to, and allow them to bring in topics that they feel are related. The strength of this method is that you have the possibility of learning a great deal. Since the interviews are open-ended, you do not necessarily have to know a lot about the topic ahead of time, although some knowledge is helpful. The drawback to this method is that it is very time-consuming, so you will only be able to do a relatively small number of interviews. Another drawback is that the kind of information collected in these sorts of interviews does not easily lend itself to statistical analysis.

Semi-directed Group Interviews

This type of interviewing is similar to key respondent interviewing in that you want to identify the most knowledgeable people. However, rather than interviewing each person separately, you bring them all together and interview them as a group. These interviews are also open ended, with a few questions raised for discussion. The idea here is to get the experts on a

particular topic in the community talking to one another about the topic. In this way you can get a sense of what the community consensus is on the topic, as well as what the disagreements are. It also allows you to find out who the locally acknowledged experts are on specific details. This has an advantage over the key respondent interview in that you interview all the respondents at once, so it is less time consuming. However, some people may be uncomfortable speaking in front of others on some topics, and just a few people may dominate the discussion.

Mapping Interviews

This type of interview is conducted with the use of maps. The respondent marks hunting and fishing areas, kill sites, or resource population observations on an acetate sheet laid over a map. This is a very powerful technique for gathering information on anything involving a spatial dimension. Maps drawn by several respondents can be combined in reports in order to avoid revealing information on a particular individual's activities.

Self-reporting

In this technique, you provide your respondents with a form on which they are asked to record activities or observations. This technique is only useful in cases where the respondents are highly committed to your project, either because they are interested in the research, or see some benefit to themselves from participating. It is important to remember that your respondents, especially those living an active

subsistence lifestyle, are very busy people, with many claims on their time. In most cases, it will be better to choose a method that puts less of a time burden on the respondent.

Questionnaires

These are lists of questions, usually requiring either short answers or a selection of multiple choice responses. Questionnaires can be administered directly, with the researcher asking the respondent the questions, either in person or over the telephone, or the questionnaire can be given to the respondent to fill out (see section on self-reporting above for drawbacks). Information collected on a questionnaire, if it is well designed, lends itself easily to statistical analysis. However, these kind of interviews, if they are long, can prove tedious for both the respondent and the researcher. Also, because these interviews are structured, little room is left for unexpected information. The researcher needs to already know a lot about the topic under study in order to design the questionnaire appropriately.

Participant Observation

In this technique, you study your topic by participating in an activity or event, and keeping notes on your observations. This might involve going hunting or gathering with a knowledgeable person or persons. If this technique is used, it is important to inform the other participants in the activity that notes will be kept, and obtain their permission. It is also important to check back with knowledgeable people in the community on your conclusions, to make sure you have not misinterpreted the observed practices. This can also be a good way to get to know people.

The choice of research method will in most cases be a joint decision between the community, the TEK specialist, the project principal investigator, and the local assistant. The

following guidelines will help explain how such decisions are made, as well as how to organize the research.

Things that should be considered when choosing a research method:

⇒ What is the question you are asking? It is important to limit your research questions to what can reasonably be done in the course of the research. It is not possible (or productive) to gather all information about everything.

⇒ What information is already available to help you to refine the question?

⇒ What additional information do you need to collect in order to find an answer?

⇒ What is the best (most efficient and least intrusive) method for getting this information?

Participatory Action Research and Community Participatory Research

It is appropriate to include in the methods section a discussion of participatory action research (PAR), and community participatory research (CP), even though these are more properly described as frameworks for the conduct of research, rather than methods. It is important for both spill area residents and EVOS project principal investigators to

think about how to involve the spill area communities more directly in formulating research questions and planning research, rather than just expecting community residents to provide answers to questions raised by others. The idea is to help local people to become full participants in the research and, in a sense, also to become owners of the results of the research. The use of participatory research techniques can broaden the horizons of researchers and at the same time further empower community members to direct research at the problems and questions that are most important to them.

Ryan and Robinson describe participatory action research as follows:

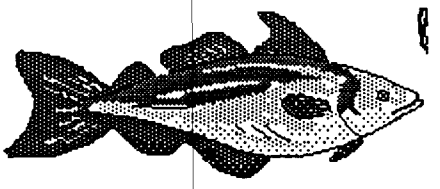
> PAR is initiated by the community and is defined, directed, analyzed, and implemented by the community. The goal is change—change in lives, in circumstances, and in economic and power relationships. PAR involves the whole community in the definition of goals, in the research process, and in the verification of data. In its practices, it involves segments of the community; a community advisory committee, research trainees, elders as experts, political leaders in fund raising, community agencies in contributions in kind. PAR helps people to identify their own strengths and resources and develop strategies for reassuming power and responsibilities; it mobilizes young and old for change. PAR operates on the basis of mutual respect. Decisions are made by consensus and participants share power, learning, and any advances or setbacks.
>
> PAR initially uses an external research facilitator, or community worker, to help to get people focused, participant [sic] and trained. The facilitator lives in the community and participates in community activities and events, but seeks to be out of a job in twenty-four to thirty months. PAR anticipates that once people are mobilized, have defined their goals, and have started action, the momentum for change will continue for many generations. In other words, PAR is a one-shot

> mechanism for change that involves the whole community in ways in which one change leads to another and another and another (Ryan & Robinson, 1996: 8).

Community participatory research is also strongly focused on local participation, but is less oriented toward change.

> CP is a method of community-based research that involves an outside facilitator or trainer and a small group of community people in a focused project of short duration, usually from three to six months. It is distinguished from PAR in that it involves less training, less institutional development, less political change, and less cost. It relies more heavily on the facilitator to analyze the data and write all the reports. The verification involves only the clients—those people in the community who have direct need of the results and who are paying for the project. CP projects have a marked practical orientation, and they often result in the negotiation of comanagement agreements, investment plans, or rapid program evaluations.
>
> CP is useful when time and money are short, and when communities are further down the development road, and therefore not in need of the full PAR approach (Ryan & Robinson, 1996: 10).

The mapping and group interview techniques described above are excellent participatory methods. Mapping, in particular produces a tangible product that communities can keep after the project is over. Other participatory methods include expansions and modifications of the mapping concept. For example, groups can make historical maps or timelines of changes to the status of a resource or to the local landscape. Maps made by different groups of residents (men, women, elders, youth) may reveal different types of knowledge or perceptions of the landscape and potentially conflicting conceptions or uses. Drawings, models, and diagrams can also be useful. They can provide a lot of information about relative harvest effort or harvest quantities, if not exact numerical data. Sometimes the most powerful data are the spoken words and reported experiences of local people.



CASE STUDY #2

AN EXAMPLE OF PARTICIPATORY RESEARCH: A PILOT STUDY IN PRIVATE FISHERY MANAGEMENT

New York State has about 40,000 farm ponds and 6,400 small to medium-sized lakes which are privately owned or controlled. Most of these ponds are either unmanaged or mismanaged, yet they have the potential to support significant fishing efforts that can provide both food and recreation.

The pilot private fishery management program assumed it was important to get the owners of the fisheries resources involved in management. The object was to establish a partnership where the owners would be encouraged to contact program leaders when they felt advice was needed.

To achieve the goals set by the owners, the project applied three features of liminological and fishery research to the management of each body of water.

1) The program used anglers to collect data about the status of fish populations. Angler diaries, ideally suited for participatory learning when coupled with appropriate educational materials.

2) The predator-prey balance was assessed through an analysis of the zooplankton community.

3) Zooplankton samples were taken, along with fish length and catch records from cooperating anglers, to provide the information necessary to make size-selective harvest recommendations that would enhance the quality of the fishing.

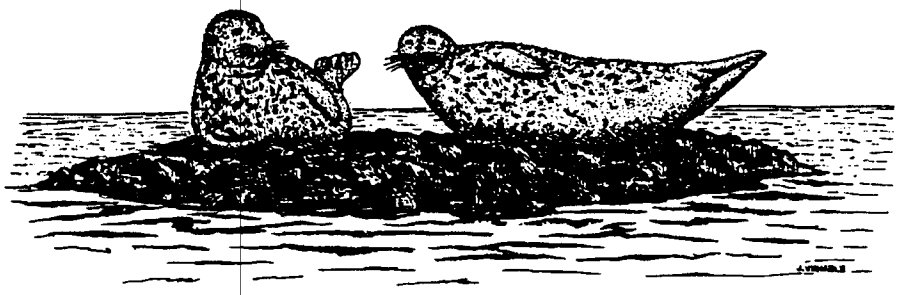
Program coordinators were issued a diary, a fish measuring rule, and written instructions for collecting information. An educational videotape was also sent to reinforce the written materials and demonstrate sampling and data collection methods. Cooperators recorded in their diaries trip information including date, duration, number of anglers, type of fishing, and data for the fish caught (species, number, length of each fish, and whether the fish were kept or released). Anglers/owners used a sampling kit and instructions provided by the program to collect data on water quality and zooplankton.

A questionaire was sent to participants with one to three years in the program to evaluate whether they improved their understanding of the fishery resource. Most indicated they gained a better understanding of how fishery resources could be managed through size-selective harvest. Many respondents indicated they'd learned a good deal about indicators of fishing quality (79%), the concept of carrying capacity (67%), and predator-prey balance (64%).

The 19 waters in the pilot program represented the majority of the types of waters found in the warm water farm ponds and small lakes in New York, making the management approach applicable throughout the state. The extension program was also shown to be economical requiring 1 to 1.5 technician, and 1 to 3 professional person days per water. Perhaps the strongest aspect of the program is the direct participation of the anglers in decision making as well as carrying out the management decisions. Participants developed firsthand understanding of "their resource" and in so doing gained more realistic expectations of its management potential. In this participatory learning process, anglers became involved early in the decisions about the fishery and participated continually in management.

Adapted from Green, Mills & Decker, 1993.

One advantage of drawings, maps, and diagrams is that they facilitate communication if the person you are interviewing is not fluent in English. You can ask them to draw bar charts showing the amount of time they spend on different resource harvesting activities at different times of the year. These types of techniques involve the respondent more directly and give them an opportunity to see and revise their ideas as well as providing a tangible product. Exercises such as asking people to contrast objects or ideas and to rank them provide fast, quasi-quantitative information on preferences and behavior. Often you can obtain more information about something by having someone compare it with something else, rather than describing it in isolation. Participating in an activity with community residents outdoors is often useful and revealing. Walking or boating a transect through the community or resource area, and then mapping it with local people can be especially useful for researchers new to an area.



CASE STUDY #3

AN EXAMPLE OF PARTICIPATORY ACTION RESEARCH: THE ALASKA NATIVE HARBOR SEAL COMMISSION

Harbor seals (Phoca Vitulina) are among the injured biological resources of Prince William Sound that have not recovered following the *Exxon Valdez* oil spill. The harbor seal populations of Prince William Sound and the northern Gulf of Alaska were in decline before the oil spill for unknown reasons. The spill injured these populations, adding to the decline. The continued decline in seal numbers in these areas of Alaska is of particular concern to Alaskan Natives for whom seals are of traditional, subsistence, and cultural importance. The goal of the project is to help restore harbor seal populations by involving subsistence users in research and management activities, bringing traditional knowledge in to supplement the data from scientific studies.

Workshops were convened to improve communication among seal hunters as well as with agencies involved in seal research and management. One outcome of these meetings was the formation of the Alaska Native Harbor Seal Commission whose mission is to promote conservation and sustainability of harbor seals for the cultural well-being of Alaska Natives. In addition to expressing their concern for the sustained health of the seal population, workshop participants voiced their desire to be active participants in harbor seal research projects. As a result, a harbor seal biological sampling program was initiated in Prince William Sound and Kenai Peninsula villages in 1996 to combine the skills and interest of seal hunters with the scientific expertise of harbor seal researchers.

The sampling needs and protocols of a variety of researchers from the Alaska Department of Fish and Game, University of Alaska and National Marine Fisheries Service were compiled into a user-friendly sampling manual, dataforms, and training program In November and December 1996, two demonstration sessions were held in which hunters from six oil-impacted villages were given the background, training, and supplies necessary to collect tissue samples from harvested seals.

Hunters collect samples from harbor seals harvested for subsistence use. Samples collected in this program have been archived at the University of Alaska Museum or dispersed to a variety of researchers for current or future analysis of the diet, genetics, reproductive status, health, and contaminant loads of the state and region's harbor seals.

Research funded by the Exxon Valdez Oil Spill Trustee Council, Restoration Project /244.

Possible Problem/Method Pairs:

A researcher can also choose to use more than one method; this is called triangulation, which is the strategy of approaching the same research problem or question with two or more techniques in order to cross check your results. If two methods such as **group interviews** and a **questionnaire** result in two very different pictures of what is going on, the researcher will want to explore further to find out the underlying reasons for the contradictory results.

If you want to study **Changes in the Status of a Resource Through Time**, you might want to use a combination of **Key Respondent Interviews** with elders and active harvesters, **Semi-Directed Group Interviews** and **Mapping Interviews** to record information on the respondent's life-long use and observation of the resource.

If you want to study the **Current Health and Distribution of a Resource**, you could use a combination of **Key Respondent Interviews** with active harvesters, and **Mapping** of kill sites and current resource distribution.

To answer questions concerning **Land Use**, you might work with harvesters to **Map** activity areas, and record seasonal cycles of use through administration of a **Questionnaire**.

If you want information on the **Timing of Harvests**, you could record seasonal cycles of use through administration of a **Questionnaire** to active harvesters.

Sampling Methods

When the population you want to study is too large to interview every member and stay within the time and budget you have, you will want to take a sample. A sample is a relatively small subset of the population under study. In order to get statistically dependable results you need to choose your sample at random (see Random Sample, below). However, sometimes you may not want your sample to be random (see Chain Referral Sample, below). As with the research method, the selection of a sampling method is determined by the nature of the questions to be answered. The possible types of samples include:

Census

In this method, you try to interview every resident in the community. It is usually not practical to interview everyone; this method is best used only in cases where a very brief questionnaire is being administered, or in a very small community.

Random Sample

In cases where it may not be possible to interview everyone, but you want to get a cross-section of all the different types of people who live in the community (including both knowledgeable harvesters and those who do not harvest at all), this method may be best. You assign each household (or each individual) in the community a number, and then use a random numbers table to choose which ones you interview. To select a sample at random the selection method has to have two properties: 1) the sample has to be unbiased, which means each unit has the same chance of being chosen, and 2) the selection of each unit has to be independent, meaning the selection of one unit has no influence over the selection of other units (Gonick & Smith, 1993: 93).

Stratified Random Sample

This method is used in a situation where you want to get a sample of all residents in the community, but you want to sample one group more than another. For example, you may want to estimate how many households do not use a particular resource, but you also want to make

sure you interview the active harvesters. You would divide the households in the community into two groups: 1) those that you know harvest, and 2) those that you don't know about. These would be your two strata. Each stratum would then be sampled in a different way. You might interview all of the harvesting households, but do a random sampling (see above) of the households that you don't know about.

Systematic Sample

This is like a random sample, in that you don't interview everyone. However, instead of using a random numbers table to choose your sample, you use other criteria. For example, you might choose to interview the residents of every other house in the community, or only people born in odd numbered years. The risk here is that you may choose your sample using criteria that introduce a bias.

Chain Referral

This method is best used if you only want to interview respondents that fall into a particular category. For example, if you are only interested in interviewing very active seal harvesters in a large community where just a few people harvest or use seals. You start out by talking to a knowledgeable individual in the community, and get a list of all the seal harvesters they know about. You interview the people on that list, each time asking whether they know of any active seal harvesters not on the list. If they give you any new names, these are added to your list of people to interview. The risk here is that you may miss a few people who are involved in the activity you are studying.

Discussion of Relative Merits of Different Sampling Methods

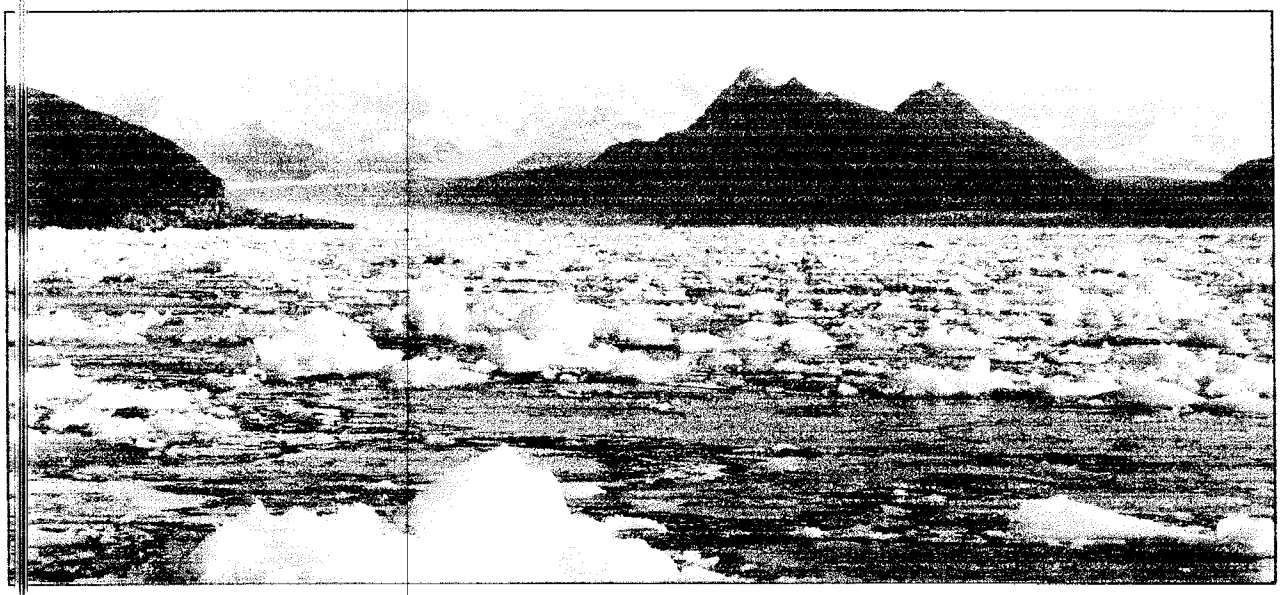
The researcher should try to get as large and knowledgeable a sample as possible. A **randomized sample** will produce a **statistically representative cross section** of the activities and use areas of the community. However, this is not the best sample if the intent is to produce a complete depiction of all the areas used for subsistence activities. This is because often only a few people will produce most of the fish, game, and plants used by the community. Accordingly, the sampling method should try to select individuals who have the most experience and knowledge about particular subsistence activities. These individuals may be called "local experts".

Active adults supporting families, and elders who have a lifetime of experience in subsistence activities, are logical starting points for interviews. These persons are more likely to know the areas used for fishing and hunting by the community. Both men and women should be sampled so activities allocated along a sexual division of labor are documented. The sample of persons interviewed should be drawn from all the extended families in the community. This is because particular river drainages, lakes, and hills may be recognized as the traditional use areas of certain kin groups. These use areas may not be recorded if members from that kin network are not interviewed. Identifying the elders in the community is one way to identify kinship groups, as extended families typically have an elder head accorded special status.

If the goal is to make generalizations about **relationships** such as those **between use areas and other social characteristics**, such as age, sex, and income of hunters, then a **stratified selection** may be a preferred sample selection technique. For instance, if a comparison is to be made between the use areas of adolescents, young adults, and mature adults, then persons from each age range must be sampled and interviewed.

DATA GATHERING TOOLS

A variety of tools are available to the researcher in the gathering of information on traditional ecological knowledge. These include **notebooks, tape recorders, still cameras, video cameras, calendars,** and **computers**. Whichever tool is used, it is important to keep accurate written records of when and under what circumstances the information was recorded. This will allow for more accurate interpretation and reporting later. The researcher should obtain a written release from the respondent for the later use of audio recordings, video recordings, and photographs. Again, it is necessary to inform the respondent that recordings or photographs are being taken, as well as of the uses the material may be put to in the future.



VISUAL AIDS TO INTERVIEWING

Visual aids such as **maps, photographs,** and **artifacts** can make the interviewing process easier, and more interesting for both the respondent and the interviewer. These are especially effective in key respondent and semi-directed group interviews, where they can serve to spark the memory of respondents. Another useful technique is to conduct the interview in the location

being discussed, or for example, to conduct a key respondent interview on seal hunting while participating in a seal hunt. Because local names for some resources can vary, accurate drawings of resources, such as Mac's Field Guides[1], may be helpful in making sure both the respondent and the researcher are talking about the same animal species.

ORGANIZING, ANALYZING, AND REPORTING THE DATA

There are two principal kinds of data: 1) **Quantitative Data**, or data based on numbers that lends itself easily to statistical analysis, and 2) **Qualitative Data,** which is based on observations and is difficult to analyze or express in numbers or statistics.

DESCRIPTION, ANALYSIS, AND INTERPRETATION

Description deals with the question, "What happened?" The data here can be things seen by the researcher (Qualitative Data) or the measurements and frequencies of things that occurred (Quantitative Data).

Analysis means figuring out what parts of the description are the most important in explaining what happened and what the relationships are between the parts described—in other words, analysis involves using the data to attempt to answer the question "How do things work (or not work)?"

Interpretation goes beyond analysis to ask the question "What does it mean?"

Adapted from Wolcot, 1994: 12.

Once you have collected the data, your next challenge is to organize, interpret, and report it. The first step in this organization process is to review and refine your fieldnotes. You want to do this as soon as possible after you have conducted the fieldwork, while the interview or trip is still

[1] Mac's Field Guides can be ordered from The Mountaineers, 1011 S.W. Klickitat Way, Seattle, WA 98134; (206) 223-6303.

WAYS TO ORGANIZE AND PRESENT DESCRIPTION

1. Chronological Order Events always can be related in the order they occurred, with relevant context added as needed.
2. Researcher or Narrator Order The way the story has been has been revealed to the researcher may offer another way to organize. An informant's way of unveiling his or her life story ought to be examined for its own internal logic rather than automatically reorganizing it into a chronological sequence.
3. Progressive Focusing The descriptive account may be revealed through a progressive focusing that goes in either direction, slowly zooming from broad context to the particulars of the case, or starting with a close-up view and gradually backing away to include more context. Most likely the zooming will move in both directions.
4. Day in the Life Readers may be privy to a fictionalized account, an entire day, or a typical daily sequence of events.
5. Critical or Key Event The description can focus on only one or two aspects, creating a story-within-a-story in which the whole story is revealed or reflected.
6. Plot and Characters Where individuals are central to a study, the researcher may proceed as though staging a play. First, the main characters are introduced. Then the story is put into motion. The researcher may either fade into the wings or assume the role of narrator.
7. Groups in Interaction In the same way it is necessary in some tellings to keep individual characters clearly identified, it often proves helpful to researcher and reader alike to create distinct group identities to emphasize differences important to a case.
8. Follow an Analytical Framework By having a framework in mind during the fieldwork, the researcher, increases the likelihood that, when the time comes for analysis, they will have the data they need. Making sure that the descriptive portion of an account will include the detail necessary for subsequent analysis or interpretation raises an important issue: how to ensure that one does not gather only data that support a preconceived framework. To avoid this, the researcher should ask: "Am I attending as carefully to what *is* going on as I am attending to what I *think* is going on?"
9. Multiple Points of View As a story telling technique, any descriptive account can be related through the eyes of different participants, seemingly freeing the researcher from having to disclose his or her own view—except for the presence of the authorial hand that has guided each viewer's recounting.
10. Write a Mystery Organize and present the study as though writing a mystery novel. The problem focus becomes a mystery to be solved. With the researcher in the key role of detective, data are introduced in the manner of accumulating evidence, to be sifted, sorted, and evaluated according to their contribution to solving the mystery. The challenge here is to write with a sense of excitement and discovery.

Adapted from Wolcot, 1994: 17.

WAYS TO APPROACH ANALYSIS

1. Highlight Your Findings Report or summarize whatever was counted, measured, inquired about. Organize the data in such a way as to reveal underlying properties, structures and relationships.
2. Display Your Findings Organizing data in tables, charts, diagrams, maps, and figures can help one explore relationships among the data. Such graphics are also a good way to present and illustrate findings. Other visual approaches include the use of photographs, film and videotape.
3. Identify Patterned Regularities in the Data Look for and discuss the relationships among the data. What do the data tell us that can be applied outside the specific case studied. A major contribution of qualitative research is the formation of conclusions that have broader applicability.
4. Compare With Another Case Controlled comparison between a known case and the case being analyzed, noting similarities and differences between them, offers a way for the researcher to explore the data.
5. Evaluate Evaluation is a form of comparison in which some explicit or implicit standard supplies the comparability by which judgments can be made. The critical element is to have a recognized or agreed-upon standard. An alternative approach is to have those immediately involved or affected by the research evaluate the data, with the researcher acting as information processor.
6. Contextualize in a Broader Analytical Framework Most often this is accomplished, through informed references to some recognized body of theory, or to earlier studies that are recognized as classics, in the tradition of the literature review. The researcher can also make the connections personal, such as to one's own expectations, to experience, to conventional wisdom, or to social norms.
7. Critique the Research process Break loose and be more speculative. This can be accompanied by "full disclosure", advising your reader that, although what you are able to convey from your observations does not conform to your own customary standard of reporting, the possible significance or implications of those observations seem too great to ignore.
8. Propose a Redesign for the Study If the problem with the research was more serious than one of inadequate techniques or inadequate data, you may still have something important to contribute if you turn your analytical efforts to issues of conceptualization or design

Adapted from Wolcot, 1994: 29.

fresh in your mind. The goal here is to make your notes as clear and complete as possible so you will not have to rely on your memory later. You should then organize your material into topic areas, in order to make the next step, analysis of the data, easier.

Analyzing the data means looking at the information you collected and trying to make some sense out of the responses you received. This can mean performing statistical manipulations on the information you gathered from administration of a questionnaire to a large sample population. Statistics is a branch of mathematics which, based upon the laws of probability, allows for comparisons among data and generalizations from the sample to the larger population of which it is a part. (A full explanation of statistical analysis is beyond the scope of this handbook. Suggested readings on this topic are provided in the bibliography.)

You analyze your data by testing out ideas of what you think it may mean, to see if the evidence fits your idea. At this point in your research, you may want to write out some of your ideas and share them with the respondents, other community residents and other researchers to find out if you are on the right track.

Once you have completed the analysis of the data, and reached some conclusions, you can write a draft report. You should allow opportunities for community leaders and other community residents, as well as other researchers to review

INTERPRETATION

1. Go Beyond Analysis This is an opportunity to speculate. Note the implications or inferences that one might draw from the data.
2. Make the Leap Hunches are appropriate here, as long as they are presented as such. You do not need to present your every written statement with certainty, there is vast interpretative possibility in uncertainty.
3. When You Come to the End Stop! Presenting a weak interpretation is worse than presenting no interpretation at all. If you cannot find an interpretive framework that fits, do not take away from what you have accomplished by tacking on a weak interpretation. Take the account as far as you can with confidence, then stop.
4. Do as Suggested Try to incorporate suggestions made by your critics. Your critics include your colleagues, editors, and anonymous referees. If you are struggling with the challenge of interpretation, there is no better way to overcome that hurdle than to place your case before interested associates and to invite their comments. The crucial element in soliciting feedback is to engage in a dialogue about interpretative possibilities.
5. Turn to Theory For interpretation, theory provides a way to link case studies with larger issues. It is this linking power, rather than explanatory power, that makes theory so popular with researchers. One interpretative tack is to examine a case in terms of competing theories to see which best fits your observations.
6. Refocus on Interpretation Itself Sometimes intentionally, sometimes not, interpretation works its way to center stage, the descriptive account serving only as introduction or example for a major effort at interpretation. More than simply linking up with theory or leaning on it for an interpretative framework, the objective here is to develop that framework. Descriptive research previously reported may be reviewed briefly for illustration or inspiration, or some newly proposed conceptual apparatus may be turned back on original data as a test of its explanatory power or completeness.
7. Connect With Personal Experience This approach offers two interpretative options. The first is to personalize the interpretation: "This is what I make of it all." The second is to make the interpretation personal: "This is how the research experience affected me."
8. Analyze the Interpretive Process In lieu of the solid interpretation you may have hoped to provide, you might instead analyze the interpretive process. Explain what seems to be holding you back or what pieces of the puzzle are still missing. Try to identify other factors as well, considerations that may leave your readers with a clearer sense of the problem in spite of the fact that you yourself feel no closer to an answer.
9. Explore Alternative Formats. The more imaginative you may want to be in your interpretation, including the exploration of personal feelings and beliefs, the more you may feel hampered rather than empowered by the academic format. Consider alternative literary or cultural forms such as poetry, historically or ethnographically accurate fiction, or performance of text.

Adapted from Wolcot, 1994: 40.

and comment on your draft report. It may be a good idea to schedule a community meeting so you can present the research to the community and take their comments into consideration before writing your final report.

The products of your research may take several forms in addition to a written report. You may produce data sets, maps, equations (a mathematical way of representing relationships), orfamily trees. It is important that the details of how each product will be used is worked out as part of the research agreement negotiated with the village council.

FINAL WORD/CONCLUSION

While the collection and use of traditional ecological knowledge requires planning, negotiation, and careful work, there are benefits to be gained by both the oil spill restoration process itself and the communities involved in the research. Researchers and village councils can work together in an atmosphere of mutual respect to ensure that residents of the communities impacted by the *Exxon Valdez* oil spill have the active role they seek in the restoration process, while at the same time advancing the goal of restoring the resources and lives impacted the spill. It is hoped that this handbook will bring us a little closer to achieving that goal.

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PROTOCOLS FOR INCLUDING INDIGENOUS KNOWLEDGE IN THE *EXXON VALDEZ* OIL SPILL RESTORATION PROCESS

Exxon Valdez Oil Spill Trustee Council
December 6, 1996

Introduction, Purpose, and Objectives

Indigenous knowledge, including traditional ecological knowledge (TEK), provides an important perspective that can help the *Exxon Valdez* Oil Spill (EVOS) restoration effort by providing information and analysis of the environment and resources affected by the oil spill. Fishers, hunters, and gatherers have detailed descriptions of animal behavior and ecology. For many species, subsistence harvesters possess the following information:

- where it is found in any season
- what it eats
- how it moves from place to place
- when it mates
- where its young are born
- what preys on it
- how it protects itself
- how best to hunt for it
- population cycles

As astute observers of the natural world and as repositories of knowledge on the long term changes in their biophysical environment, practitioners of TEK can provide western biologists and ecologists with systematic and analytical observations that cover many years. While the differences between indigenous and scientific ways of knowing must be understood, restoration projects which successfully incorporate both perspectives will improve our collective understanding of the natural processes involved in the EVOS-affected region.

Working in and with Alaska Native communities requires sensitivity to their cultures, customs, traditions, and history. Successful working relationships are built on mutual respect and trust. The people of the communities of the oil spill area have experienced severe dislocations in their lives due to the *Exxon Valdez* Oil Spill. Subsistence and commercial fishing activities have been interrupted. Researchers and agency personnel

Trustee Agencies
State of Alaska: Departments of Fish & Game, Law, and Environmental Conservation
United States: National Oceanic and Atmospheric Administration, Departments of Agriculture and Interior

have used the communities as logistical bases. Disruptions related to the clean up, litigation, and increased bureaucratic demands have impacted the people's ability to conduct their daily business.

As a consequence of these stresses to their privacy and out of concern to preserve respect for their traditions, the Alaska Native communities of the area affected by the spill, assisted by EVOS staff, the Chugach Regional Resources Commission, and staff from Trustee Council agencies, have developed a series of protocols formalizing their relationship with outside researchers. These protocols provide a set of guidelines that will facilitate collaboration between Alaska Natives and scientists in meeting the goals of EVOS restoration. The protocols describe the major elements of a research partnership, but their application depends on common sense and courtesy. For those researchers planning to collaborate with local respondents in the collection of indigenous knowledge or whose proposed research directly affects subsistence activities, the EVOS Trustee Council requires consideration of these protocols prior to the initiation of research.

The objectives of these protocols are:

1. Provide guidelines for restoration project planning and review
2. Identify a set of ethical principles that establishes the parameters for a research partnership between Alaska Native communities and restoration scientists
3. Establish procedures for facilitating the collection of indigenous knowledge in restoration projects
4. Provide guidance on the development of research agreements between Alaska Native communities and researchers.

Protocols

1. Project planning and review.

a) In developing projects that include the collection and use of indigenous knowledge, researchers and community residents should keep in mind how this information will be used in improving restoration, management, education, and future research.
b) In designing restoration projects that include indigenous knowledge, researchers should recognize that local communities' knowledge of and interest in natural resources extends beyond the physical boundaries of the communities themselves to their harvest areas and beyond.
c) All research proposals involving indigenous knowledge will be reviewed by the TEK Specialist, the Community Facilitators, and village councils, and their

recommendations will be forwarded to the Executive Director. The overall program of research involving indigenous knowledge will be reviewed annually.

d) Costs for incorporating TEK in a restoration project should be reflected in the project's budget.

2. Ethical principles. EVOS research which involves the collection and use of indigenous knowledge should follow the ethical principles for research listed below, which are based upon guidelines adopted by the Alaska Federation of Natives (AFN) Board of Directors in May 1993 (attached).

e) Advise Alaska Native communities and people who are to be involved in or affected by the study of the purpose, goals, and time-frame of the research, the proposed data-gathering techniques, and the potential positive and negative implications and impacts of the research.
f) Obtain the informed consent of the appropriate governing bodies and of individual participants
g) Protect the knowledge and cultural/intellectual property of the Alaska Native people
h) Seek to hire local community research assistants, and provide meaningful training to Alaska Native people to develop research skills, as appropriate
i) Use the local Alaska Native language in oral communications whenever English is the second language
j) Address issues of confidentiality of sensitive material
k) Include Alaska Native viewpoints in the final study report
l) Acknowledge the contributions of local research assistants and respondents in project reports
m) Provide the communities with a summary of the major findings of the study in non-technical language.
n) Provide copies of the annual and final project reports and related publications to the local library

The AFN Guidelines also include establishing and funding a "Native Research Committee." This may not be necessary in most EVOS Restoration Projects, depending upon the scope of the collection of indigenous knowledge and the wishes of the local community. Also, a new entity may not be necessary. For example, the traditional council may serve as such a review body. This point should be addressed in a "research agreement," as discussed in #4, below.

3. Facilitating the collection of indigenous knowledge.

o) Initial contacts should be made through the TEK Specialist hired under Project 97052B to discuss the potential collection of indigenous knowledge in a project. The TEK Specialist will then pass the requests on to the communities concerned, and assist in establishing contact between the researcher and the Community Facilitator. The TEK Specialist will also inform the Spill Area Wide Coordinator of such requests.

p) Once contact has been established through the TEK Specialist, researchers should use the Community Facilitator or designee as the primary community contact.

q) The Community Facilitator or designee will arrange for the researcher to meet with the Village Council (or other appropriate body authorized by the Village Council) to discuss the project's goals, scope, methods, expectations, benefits and risks. The Facilitator or designee will help orient the researcher to the community and its customs.

4. Research agreements.

The researcher and the Village Council (or other appropriate body authorized by the Village Council), assisted by the Community Facilitator, will work together to set up a research agreement. In developing the agreement, the following topics should be considered: the nature of the research, the form of consent that will be required, the need for local research assistants, compensation of participants, acknowledgments, anonymity and confidentiality of personal and other sensitive information, project monitoring, project review, final disposition of data, and provision of study results. The agreement may take one of several forms, such as a binding contract, a memorandum of agreement, a letter of agreement, or a village resolution. In any agreement, the responsibility and expectations of the researcher and the community should be spelled out. Terms and conditions should be clear and understandable to all parties, should not place unreasonable or unfair burdens on the participants, and must be consistent with applicable laws.

AFN BOARD ADOPTS POLICY GUIDELINES FOR RESEARCH

At its quarterly meeting in May, the AFN Board of Directors adopted a policy recommendation that includes a set of research principles to be conveyed to scientists who plan to conduct studies among Alaska Natives.

The principles will be sent to all Native organizations and villages in the hope that compliance by researchers will deter abuses such as those committed in the past which lately have come to light.

Alaska Natives share with the scientific community an interest in learning more about the history and culture of our societies. The best scientific and ethical standards are obtained when Alaska Natives are directly involved in research conducted in our communities and in studies where the findings have a direct impact on Native populations.

AFN recommends to public and private institutions that conduct or support research among Alaska Natives that they include a standard category of funding in their projects to ensure Native participation.

AFN conveys to all scientists and researchers who plan to conduct studies among Alaska Natives that they must comply with the following research principles:

* Advise Native people who are to be affected by the study of the purpose, goals, and time-frame of the research, the data-gathering techniques, the positive and negative implications and impacts of the research.

* Obtain the informed consent of the appropriate governing body.

* Fund the support of a Native Research Committee appointed by the local community to assess and monitor the research project and ensure compliance with the expressed wishes of Native people.

* Protect the sacred knowledge and cultural/intellectual property of Native people.

* Hire and train Native people to assist in the study.

* Use Native language whenever English is the second language.

* Guarantee confidentiality of surveys and sensitive material.

* Include Native viewpoints in the final study.

* Acknowledge the contributions of Native resource people.

* Inform the Native Research Committee in a summary and in non-technical language of the major findings of the study.

* Provide copies of studies to the local library.

APPENDIX B

ETHICAL PRINCIPLES FOR THE CONDUCT OF RESEARCH IN THE NORTH
(Based on the Association of Canadian Universities for Northern Studies, Draft Document, 1981)

Introduction
In too many cases, researchers have worked in isolated communities without regard for the people who live there. Communities have been disrupted, and essential local resources used without consultation. Privacy is difficult in small communities, creating additional problems for participants. Guidelines, or principles, are needed so that research may be carried on with a minimum of friction and social disruption. The principles proposed here are intended to promote co-operation and mutual respect between researchers and the people of the North.

Northerners are involved with research in several different ways:

1. As research subjects.
2. Providing information.
3. As part of a research team.
4. Using the completed research.
5. Identifying research needs.

If research is to be explained clearly, conducted ethically, and used constructively, it must be guided by principles that consider all of the above mentioned ways in which Northerners are likely to be involved in research activities.

Principles
1. The research must respect the privacy and dignity of the people.
2. The research should take into account the knowledge and experience of the people.
3. The research should respect the language, traditions and standards of the community.
4. The person in charge of the research is accountable for all decisions on the project, including the decisions of subordinates.
5. No research should begin before being fully explained to those who might be affected.
6. No research should begin without the consent of those who might be affected.
7. In seeking informed consent, researchers should clearly identify sponsors, purposes of the research, sources of financial support, and investigators responsible for the research.
8. In seeking informed consent, researchers should explain the potential effects of the research on the community and the environment, and should explain the use and value of the research to the community.
9. Informed consent should be obtained from each participant in the research, as well as from the community at
10. +large.
10. On an on-going basis, participants should be fully informed of any data gathering techniques developed and used during the course of the research (such as tape recordings, photographs, physiological measurements, etc.), and the use to which they will be put.
11. No undue pressure should be applied to get consent for participation in a research project.
12. Research subjects should remain anonymous unless they have agreed to be identified; if anonymity cannot be guaranteed, the subject must be informed of the possible consequences of this before becoming involved in the research.
13. If, during the research, the community decides that the research may be unacceptable to the community, the researcher and the sponsor should suspend the study.
14. On-going explanations of research activities, methods, findings, and their interpretation should be made available to the community, with the opportunity for the people to comment before publication. Summaries also should be made available in the local language.
15. Subject to requirements for anonymity, descriptions of the data should be left on file in the communities from which they were gathered along with descriptions of the methods used and the place of data storage.
16. All research reports should be sent to the communities involved.
17. All research publications should refer to informed consent and community participation, and acknowledge community contributions to the research project.

Principles for the Conduct of Research in the Arctic

Introduction

All researchers working in the North have an ethical responsibility toward the people of the North, their cultures, and the environment. The following principles have been formulated to provide guidance for researchers in the physical, biological, behavioral, health, economic, political, and social sciences and in the humanities. These principles are to be observed when carrying out or sponsoring research in Arctic and northern regions or when applying the results of this research. This statement addresses the need to promote mutual respect and communication between scientists and northern residents. Cooperation is needed at all stages of research planning and implementation in projects that directly affect northern people. Cooperation will contribute to a better understanding of the potential benefits of Arctic research for northern residents and will contribute to the development of northern science through traditional knowledge and experience. These "Principles for the Conduct of Research in the Arctic" were prepared by the Interagency Social Science Task Force in response to a recommendation by the Polar Research Board of the National Academy of Sciences and at the direction of the Interagency Arctic Research Policy Committee. This statement is not intended to replace other existing Federal, State, or professional guidelines, but rather to emphasize their relevance for the whole scientific community. Examples of similar guidelines used by professional organizations and agencies in the United States and in other countries are listed in the publications.

These "Principles for the Conduct of Research in the Arctic" address the need to promote mutual respect and communication between scientists and northern residents.

Cooperation will contribute to a better understanding...and the development of northern science through traditional knowledge and experience.

Implementation

All scientific investigations in the Arctic should be assessed in terms of potential human impact and interest. Social science research, particularly studies of human subjects, requires special consideration, as do studies of resources of economic, cultural, and social value to Native people. In all instances, it is the responsibility of the principal investigator on each project to implement the following recommendations:

1. The researcher should inform appropriate community authorities of planned research on lands, waters, or territories used or occupied by them. Research directly involving northern people or communities should not proceed without their clear and informed consent. When informing the community and/or obtaining informed consent, the researcher should identify:
    a. all sponsors and sources of financial support;
    b. the person in charge and all investigators involved in the research, as well as any anticipated need for consultants, guides, or interpreters;
    c. the purposes, goals, and time frame of the research;
    d. data-gathering techniques (tape and video recordings, photographs, physiological measurements, and so on) and the uses to which they will be put; and

e. foreseeable positive and negative implications and impacts of the research.

2. The duty of researchers to inform communities continues after approval has been obtained. Ongoing projects should be explained in terms understandable to the local community.
3. Researchers should consult with and, where applicable, include northern communities in project planning and implementation. Reasonable opportunities should be provided for the communities to express their interests and to participate in the research.
4. Research results should be explained in nontechnical terms and, where feasible, should be communicated by means of study materials that can be used by local teachers or displays that can be shown in local community centers or museums.
5. Copies of research reports, data descriptions, and other relevant materials should be provided to the local community. Special efforts must be made to communicate results that are responsive to local concerns.

Researchers should consult with and, where applicable, include northern communities in project planning and implementation.

6. Subject to the requirements for anonymity, publications should always refer to the informed consent of participants and give credit to those contributing to the research project.
7. The researcher must respect local cultural traditions, languages, and values. The researcher should, where practicable, incorporate the following elements in the research design:
   a. Use of local and traditional knowledge and experience.
   b. Use of the languages of the local people.
   c. Translation of research results, particularly those of local concern, into the languages of the people affected by the research.
8. When possible, research projects should anticipate and provide meaningful experience and training for young people.
9. In cases where individuals or groups provide information of a confidential nature, their anonymity must be guaranteed in both the original use of data and in its deposition for future use.
10. Research on humans should only be undertaken in a manner that respects their privacy and dignity:
    a. Research subjects must remain anonymous unless they have agreed to be identified. If anonymity cannot be guaranteed, the subjects must be informed of the possible consequences of becoming involved in the research.
    b. In cases where individuals or groups provide information of a confidential or personal nature, this confidentiality must be guaranteed in both the original use of data and in its deposition for future use.
    c. The rights of children must be respected. All research involving children must be fully justified in terms of goals and objectives and never undertaken without the consent of the children and their parents or legal guardians.

d. Participation of subjects, including the use of photography in research, should always be based on informed consent.

e. The use and disposition of human tissue samples should always be based on the informed consent of the subjects or next of kin.

11. The researcher is accountable for all project decisions that affect the community, including decisions made by subordinates.

12. All relevant Federal, State, and local regulations and policies pertaining to cultural, environmental, and health protection must be strictly observed.

13. Sacred sites, cultural materials, and cultural property cannot be disturbed or removed without community and/or individual consent and in accordance with Federal and State laws and regulations. In implementing these principles, researchers may find additional guidance in the publications listed below. In addition, a number of Alaska Native and municipal organizations can be contacted for general information, obtaining informed consent, and matters relating to research proposals and coordination with Native and local interests. A separate list is available from NSF's Division of Polar Programs.

Cooperation is needed at all stages of research planning and implementation in projects that directly affect northern people.

Publications

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