

***Traditional Ecological Knowledge:
Integrating Indigenous Wisdom into Watershed Science and Education
2011***

Mary Hindelang
Michigan Tech University, Adjunct Assistant Professor, SFRES
& Keweenaw Bay Ojibwa Community College, Science and Health Curriculum Specialist

A Place Called Earth: We Are All One

Michigan's Upper Peninsula: Natural Features

Keweenaw Bay: Niiwin Akeaa Center (Four Directions Community Center)

Traditional Ecological Knowledge and Wisdom (TEKW) is the accumulated knowledge and understanding of place of human beings in relation to the world in both an ecological and spiritual sense

Indigenous Ecology

- **To indigenous people, a sense of place goes beyond the natural history to encompass the bio-cultural landscape rich in story and meaning**
- **Long-resident cultures have over time developed knowledge and wisdom strategies which have enabled them to sustain environment, resources, and populations.**
- **Wisdom-keepers -- Indigenous people are considered the stewards of much of the world's biodiversity**

Conflict between "Ways of Knowing"

"Scientists & Indigenous Elders:

Both speak little English.

Both have difficulty communicating their knowledge to those who use it.

Both are isolated from much of the knowledge held by the other.

And until recently they have seen little use for each other's knowledge."

~ Berkes

Ecological Society of America on TEKW:

- **To promote the respectful use of traditional ecological knowledge in ecological research, application, and education**
- **To encourage education in traditional ecological knowledge and wisdom**
- **To stimulate research which incorporates the traditional knowledge and participation of indigenous people**
- **To increase participation by indigenous people in science, research, and education**

Importance of Native Cultural Survival and TEK to Resource Management

TEK is an integrated body of spiritual and practical knowledge that has evolved over vast stretches of time through the successful adaptation of an indigenous people to their particular ecosystem.

TEK is highly unique and ecosystem specific and includes:

- **tribal myths and stories which contain important ecological information encoded in deep metaphors;**
- **detailed plant and animal knowledge;**
- **tribal remembrances in the oral tradition of climatic and environmental changes in ecosystems;**
- **specific management practices, techniques and knowledge of the land;**
- **spiritual/ceremonial knowledge and practices of thanksgivings and world renewal.**

Recognizing the accumulated knowledge and understanding of indigenous people about the natural history of the plants and animals in their regions over time, the relationship of human beings to the natural world in both an ecological and spiritual sense is often revealed through stories, legends, songs, and art.

Indigenous Storytelling

Just before dawn on the fourth day, the eagle flew out of the crack between darkness and light, that edge between night and day. He flew so high that he flew completely out of sight. He said, I have seen that there are humble people who are still trying to live in harmony with the universe. The Creator entrusted the Eagle with the duty of reporting to him each day the condition of the Earth's people. So the miracle of sunrise happens again for the Anishinaabe. This is why the Eagle is so respected by nature and natural people everywhere.
~~A legend by Jay Loonsfoot.

Traditional Winter Camp

Winter Solstice – Inuvialuit Drummers and Dancers Dancing for the Sun to Return

Inuit Fisherman

Subsistence Activities

Caribou Hunters

One Who Runs on Hind Legs

Reindeer Ride to Inuvik: Reindeer and caribou belong to the same species. They dispersed through the arctic regions of the world and developed minor differences as reindeer became domesticated.

The Changing World Indigenous peoples voice urgency on climate change

"Inuit are an ancient people. Our way of life is dependent on the natural environment and animals. Climate change is destroying our environment and eroding our culture. Climate change is amplified in the Arctic.

What is happening to us now will happen soon in the rest of the world."

Watt-Cloutier, chair of the Inuit Circumpolar Conference

***"The Last Caribou"* Climate change and the old ways**

Giving Voice

It is true that many of our old ways have been lost. But just as the rains restore the earth after a drought, so the power of the great mystery will restore the way and give it new life. In ignorance and carelessness people have walked on our Mother Earth. They did not understand that they are part of all beings, the four-legged, the winged, Grandfather Rock, the tree people, and our star brothers. Now our Mother and all our Relatives are crying out. They cry for the help of all people.

~ Lakota Prayer

Greg Cajete, Ph.D., (Santa Clara Pueblo), NAS Chair, Associate Professor Education

Gregory Cajete, Native American educator whose work is dedicated to honoring the foundations of indigenous knowledge in education. Dr. Cajete is a Tewa Indian from Santa Clara Pueblo, New Mexico. He has served as a New Mexico Humanities scholar in ethno botany of Northern New Mexico. Dr. Cajete also designs culturally-responsive curricula geared to the special needs and learning styles of Native American students. These curricula are based upon Native American understanding of the "nature of nature" and utilizes this foundation to develop an understanding of the science and artistic thought process as expressed in Indigenous perspectives of the natural world.

Dr. Robin Wall Kimmerer, Director of the Center for Native Peoples and the Environment at State University of New York College of Environmental Science and Forestry

- The center focuses on developing connections between traditional ecological knowledge and western scientific approaches by integrating multicultural perspectives into courses across the broad spectrum of ESF's programs.
- Kimmerer is active in efforts to broaden access to environmental science training for Native students, and to introduce the benefits of traditional ecological knowledge to the scientific community, in a way that respects and protects indigenous knowledge.

■In both her writing and her teaching, Kimmerer draws on her experience as a scientist as well as her Native American heritage. She is part Potawatomi and she says her work is an effort to help her culture survive.

■*“What makes this center unique is the bridge between western, scientific knowledge and traditional ecological knowledge,” she said. “This is a way to increase our ability to learn from each other and work together to solve environmental problems.”*

Edward Benton-Banai

The Mishomis Book : The Voice of the Ojibway

■Eddie is a Spiritual Teacher of the Fish Clan Lac Court Orielles Band of the Ojibway Nation. Eddie is the Executive Director of the Red School House, St. Paul, MN., and one of it's original founders with 150, K through 12 Indian students. Eddie has a Master's Degree in Education.

■He is a pioneer in culture-based curriculum and Indian alternative education who believes that education should be built on identity, spirituality, music, heritage and pride.

■As author of The Mishomis Book (Indian Country Press), Eddie has set down the oral history of the Ojibway nation and presented his life within the family circle. He learned from the tribal elders who possessed the memories and wisdom of the Ojibway and carefully preserved the ancient traditions. The book is an account of the culture, history and philosophy of the Ojibway.

■Eddie explains that this is the first book written in this manner, "from oral tradition, and I hope it is only the beginning. I firmly believe it is time for Indian people to come forward with teachings, prophecies and insight. It is time to talk with our Brothers and Sisters of other nations, colors and beliefs.

Lori Sherman ~

Coordinator of Native American outreach helping community college students feel at home at Michigan Tech.

Ojibway tribal member Lori Sherman models the jingle dress she wears at powwows. MICUP helped her make the transition to college, and now she codirects the program at Michigan Tech.

Great Lakes Indian Fish & Wildlife Commission (GLIFWC)

■GLIFWC is an Inter-tribal, co-management agency committed to the implementation of off-reservation treaty rights on behalf of its eleven Ojibwe member bands.

■Member bands retain what are commonly referred to as treaty rights. Specifically, these are off-reservation hunting, fishing, and gathering rights in lands the Ojibwe ceded to the United States in the Treaties of 1836, 1842, and 1854.

■These rights, which the Ojibwe have always had, were reserved by the bands and guaranteed by the United States to ensure that the tribes could meet subsistence, economic, cultural, spiritual and medicinal needs.

■The bands may exercise these rights in ceded areas of Michigan, Minnesota, and Wisconsin are entitled to 50% of available resources to meet their needs.

Gidakiiminaan (Our Earth)

***Migizi wa sin* -- Eagle Rock**

Teachings and Community Support Creating a Vision for our Communities & Mother Earth

Jessica Koski

Keweenaw Bay Indian Community
Master of Environmental Management 2011
Yale School of Forestry & Environmental Studies

Indigenous Earth Issues Summit 2010
Northern Michigan University

■Eagle Rock, a sacred place to Anishinaabe people, is currently threatened as the proposed mine portal for the Rio Tinto/Kennecott Eagle Mine on the Yellow Dog Plains. Our fresh groundwater, waterways and Lake Superior are threatened by the Eagle Mine and increasing sulfide and uranium mining interests throughout the Great Lakes region.

Native and non-Native people nationwide will gather for Solstice ceremonies and to honor sacred places, with a special emphasis on the need for Congress to build a door to the courts for Native nations to protect our traditional churches.

The Problem

Indigenous peoples throughout the world are struggling to maintain their way of life in the midst of globalization because economic expansion depends on the exploitation of natural resources at the expense of local communal groups.

What are some environmental injustices facing our communities?

The Process of Colonization:

- Colonization begins with forced, involuntary entry
- The colonizing power carries out a policy that constrains, transforms, or destroys the indigenous culture, including values, orientations, traditions, ways of life, and modes of subsistence.
- The members of the subordinate or colonized group are typically governed by representatives of the dominant power.
- The colonized have the experience of being managed and manipulated by outsiders who employ a racist ideology to maintain the system of dominant- subordinate relations.

Do we experience environmental racism?

- Definition of environmental racism:
- Any racial/ethnic discrimination in environmental policy formulation, implementation, and enforcement of environmental law at the local, national and global levels.

- An example of environmental racism facing our community:
- Ethnic discrimination in the enforcement of Michigan's mining law to protect a Native American place of worship, Migizi wa sin, Eagle Rock, from mining interests on the Yellow Dog Plains.

Do we live in a postcolonial society?

- Did we invite outside mining interests into our communities and ceded territory?
- Does the State of Michigan and the United States carry out any policies that constrain, transform or destroy our indigenous culture, values, traditions and way of life?
- Are members of our community represented in dominant governing structures and decision-making processes?
- Do we experience racist ideologies?

Rio Tinto's Vision of the Upper Peninsula...

■ *"Eagle is just one of many projects that will add to Rio Tinto's growth and value. It is a 4.1 million tonne (1) high-grade nickel resource (3.6% nickel, 2.9% copper) in a highly prospective region for additional nickel discoveries. Our exploration team discovered Eagle in 2002 and we are now reviewing over 450,000 acres of mineral title we have in the area. Our focus is on six further adjacent prospects that may have the potential to extend significantly the mine life at current planned production rates."*

■ http://www.riotinto.com/media/18435_media_releases_6958.asp December 12, 2007

Kennecott's Work – Aerial views

What is *your* vision?

- Healthy, beautiful, sacred environment
- Sustainable forestry and food economy
- Save the Wild UP in the Lake Superior basin
- Environmental Justice and Indigenous Rights
- Self-determination
- Language & cultural revitalization
- Respect for our treaty rights, distinct culture, and Mother Earth

What is the vision for our traditional lands?

- We have a voice and we need to make it heard for the issues facing our communities and Mother Earth.
- We can start by revitalizing, maintaining and strengthening our cultural values and traditions.
- Be strong and keep fighting for Mother Earth
- Educate yourself and others on the issues. It may not be in the mainstream media and you may have to search for the truth.
- Have courage to make lifestyle changes and promote environmental protection within your local communities.
- There are numerous injustices against human beings and the planet happening right now and Mother Earth needs us to stay strong more than ever before.

What resources and opportunities are available to us to promote change in our communities and for Mother Earth?

■ **Education**

■ **Pre-primary programs, public schools, KBOCC, NMU, Michigan Tech**

■ **Leaders**

■ **Tribal Council, Elders**

■ **Networking with other communities**

■ **Building an inter-tribal alliance**

■ **Cultural Values**

■ **Finding and following your path in the community**

Oshkinawe-Ogichidaag Akiing

New Warriors for the Earth

■ “Eagle Rock is a sacred place to Anishinaabe people. Our fresh groundwater, waterways, and Lake Superior are threatened by the Eagle Mine and increasing sulfide and uranium mining interests throughout the Great Lakes region.”

**Keweenaw Bay Indian Community
Science Camp**

In Keweenaw Bay, elders share their knowledge regarding animals and plants in the Lake Superior region about predator/prey relationships, habitat quality, and traditional ecology.

Animals in our “home”

Important Plants

Predator & Prey/ Wolf & Moose

Isle Royale Research

Moose have had a long history in Michigan

Archaeological evidence indicates that humans occupied portions of the Lake Superior region shortly after the last ice sheet retreated.

These early people were hunters who moved frequently in search of food.

However, as the northern forests were logged, and settlers cleared the land, moose habitat was destroyed, and moose virtually disappeared from most areas of the state by the late 1800s.

During the last century, natural forest growth and succession and forest management practices have transformed the Lake Superior watershed into excellent moose habitat.

In the winters of 1985 and 1987, moose were trans-located from Ontario by the Michigan DNR to an area in the central UP in a reintroduction effort called Moose Lifts I and II.

Since 1985, biologists have been monitoring the moose population and habitat and residents have had the opportunity to enjoy the return of moose to the ecosystem.

This provides exciting learning opportunities, especially for students living in an area where North America's largest ungulate, moose (*Alces alces*) (“mooz”, Ojibwa), roam freely.

Research scientists, wildlife biologists, Ojibwa community members, and mentors from the American Indian Science and Engineering Society joined efforts to present this moose habitat discovery project at the Keweenaw Bay Indian Community Summer Science Camp.

Gikinawaabi – learning by observation (Ojibwa)

Field trips to the local moose habitat locations allowed opportunities for searching for clues, using GPS locators, map and compass work, triangulation with radio telemetry locations, and meticulous observational and recording skills. Students will also make observations on the human impact in natural areas.

Using information from the Michigan DNR and the Isle Royale Moose/Wolf Ecological Studies, students will compile information addressing their own curiosity about the home-range, habitat needs, and energy requirements of moose in Michigan

From the information they gathered, teams of students make predictions and construct questions about moose behavior, habitat, and population status that can be answered through investigations in the nearby forests

Students learned about animal tracks and sign and how to become outdoor detectives using nature field notes to journal their observations in a scientific, artistic way.

Learning from Elders and Spiritual Leaders

All Life is Connected

Traditional Anishinaabeg Lunch

- Venison roast (4 oz), 200 calories, 5% Fat, Iron and B vitamins
 - Wild Rice (1 cup), 180 calories, 0 % fat, fiber, B vitamins
 - Fiddle heads (1 cup), 35 calories, 0 % fat, fiber, vitamin C
 - Bannock (4 oz), 150 calories, 7% fat, fiber, B vitamins
 - Raspberries (½ cup), calories 35, 0 % fat, Vitamin C
- Total traditional meal: 600 calories, low in fat and high in nutrients

Fast Food Lunch

- Cheeseburger (1/4 #), 530 calories, 51 % fat, Iron, B vitamins
- French Fries (2 C), 610 calories, 29 % fat, minimal nutrients

- Soda Pop (16 oz), 200 calories, 0 % fat, 54 grams sugar, 0 nutrients
- Ice Cream (1 C), 320 calories, 45 % fat, trace of calcium

- Total fast food: 1660 calories, large amount of fat and sugar, minimal fiber and nutrients.

Indigenous Wisdom

“We fear the cold and the things we do not understand. But most of all we fear the doings of the heedless ones among ourselves.”

An Inuit Shaman

Acknowledgements

- North American Moose Foundation,
Grants for Middle School Students
- Keweenaw Bay Ojibwa Community and
Donald Dowd, 3rd Level Mide’wiwin
- KBIC Natural Resources Department
- Great Lakes Indian Fish & Wildlife Commission, Odanah, Wisconsin
- Michigan DNR & Rob Aho, Wildlife Biologist
- Michigan Technological University,
Wolf/Moose Ecological Study

Finding Our Foundation

Everything the Power of the World does is done in a circle. The sky is round and I have heard that the earth is round like a ball and so are all the stars. The wind, in its greatest power, whirls. The sun comes forth and goes down again in a circle. The moon does the same and both are round. Even the seasons form a great circle in their changing and always come back again to where they were. The life of a man is a circle from childhood to childhood. Everything tries to be round.

~~ Black Elk