National Aeronautics and Space Administration

Native Peoples - Native Homelands
Climate Change Workshop II

Final Report

Nancy G. Maynard, Editor

November 18-21, 2009
Mystic Lake on the Homelands of the
Shakopee Mdewakanton Sioux Community
Prior Lake, Minnesota

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Table of Contents

Editor's Notes

It is hoped that this workshop report gives the reader an appreciation of the extensive amount of wisdom, observations, energy, and hard work of all the Native Peoples who gathered at Mystic Lake in 2009 to contribute their collective knowledge of the current impacts of climate change on Native Peoples and their lands in the US as well as possible future strategies. A special tribute to the workshop participants is the outcome that, as this report goes to print, it is clear that some of the discussions which took place at this NP/NH workshop have since that time laid the groundwork for direct contribution to the new US National Climate Assessment - expected to be published in 2014 because it includes an entire chapter devoted to "Indigenous Peoples, Lands, and Resources."

Other Notes

- To provide some background and context to students and other readers of this workshop report who might not be familiar with issues associated with Native America and climate change, certain portions of Chapter 12 of the U.S. National Climate Assessment 2001 "Foundation Report" have been reprinted in this report for the reader's reference. (Chapter 12 was written based upon discussions from the first Native Peoples-Native Homelands Climate Change Workshop in 1998.) Chapter 12 reference:

  Schuyler Houser, Verna Teller, Michael MacCracken, Robert Gough, and Patrick Spears. 2001. "Potential Consequences of Climate Variability and Change for Native Peoples and Homelands." In: National Assessment Synthesis Team. Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change. Pp. 351-377. Cambridge University Press, Cambridge UK.

- In addition, to highlight some of the regional concerns identified in other workshops held as part of the U.S. National Assessment, selected regional information from those workshops is reprinted here to provide background and context for consideration of Native Peoples and Homelands issues and concerns.

- The workshop was organized in order to hear from as many Native participants as possible, and while we tried to capture and transcribe most presentations for the report, the large numbers of excellent speakers exceeded our recording capabilities, so we must offer our apologies to those whose talks are not fully transcribed in the report. Instead, it became necessary to compile the essence of many discussions throughout the workshop in shorthand listings of "bullets" during the sessions.

Acknowledgements

To the many partners who helped organize the workshop and collect/create the various pieces of this report: our grateful acknowledgement and thank you! Thanks to Robert Kilgore of NASA Goddard Space Flight Center, Technical Information and Management Services Branch, for his special efforts in the final publication of the report. And, a very special thanks to NASA's Tribal Colleges and Universities Project (TCUP) and NASA's Earth Sciences Division for their support, which made this workshop possible."

Executive Summary

The Native Peoples Native Homelands (NP/NH) Climate Change Workshop II was convened November 18-21, 2009, on the homelands of the Shakopee Mdewakanton Sioux Community at the Mystic Lake Casino Hotel, Prior Lake, Minnesota to discuss and propose strategies for addressing the impacts of climate change on Native Peoples and Native Homelands. National Aeronautics and Space Administration (NASA), through its Tribal Colleges and Universities Project and Earth Science Division, along with its partners sponsored this important collaborative and comprehensive national gathering of more than 400 Native leaders, scholars, scientists, elders, tribal college students and faculty, as well as a number of other scientists.

The workshop, coming a decade after the first U.S. Native Peoples-Native Homelands Climate Change Workshop in 1998, was designed to update the findings conducted in conjunction with the 2009 U.S. National Assessment of the Potential Consequences of Climate Variability and Change. This NP/NH workshop was critically needed and timely because the just-released 2009 U.S. National Assessment of Global Climate Change Impacts in the United States did not have the opportunity to include an in-depth consideration of American Indians, Alaska Natives, or Native Hawaiians and their lands. Thus, this workshop served to provide the US National Assessment process with an update of climate impacts and adaptation strategies from US Native communities.

Under the leadership of co-chairs Dr. Dan Wildcat (Haskell Indian Nations University) and Winona LaDuke (Honor the Earth), the 2009 Native Peoples Native Homelands Workshop, like the first, examined the impacts of climate change and extreme weather variability on Native Peoples and their homelands from an Indigenous cultural, spiritual, and scientific perspective. In addition to considering impacts, the goals of this second workshop were also to develop response and adaptation actions and proactive recommendations to help ensure the longer-term survival of Indigenous communities.

More than ten years after the first U.S. Workshop on Climate Change Impacts on Native People Native Homelands, it is now known unequivocally (IPCC, 2007) that significant warming of the Earth is occurring along with the increasing levels of atmospheric CO2. Global warming scenarios point to significant increased and disproportionate impacts on Native Peoples because of their unique relationship to the land, the prevalence of subsistence land-based economies and the deep cultural and spiritual significance of place. Compounding these issues, many reservations and tribal lands are located in remote areas where substandard housing and poverty prevail, making Native communities especially vulnerable to weather extremes and peak oil issues.

"Indian reservations represent significant land holdings containing indigenous species that provide key indicators to monitor and document climate change," said Dr. Dan Wildcat, Workshop Co-Chair and Director of Haskell Indian Nations University's Environmental Research Center. "Our knowledge and work must be included in a meaningful and central way in any assessment of climate change. We need a legitimate seat at the table in policy discussions."

"Climate change impacts Indigenous peoples first and foremost," said Winona LaDuke, Workshop Co-Chair and Executive Director of Honor the Earth. "We will be in a very difficult position as Indigenous peoples if we do not act now to build resilience in our communities. This means shifting the energy paradigm so that we develop efficiency and produce our own clean energy, and it means growing our own traditional varieties of food. It means returning to self-sufficiency by creating energy and food sovereignty that can provide a bright future for the generation yet to come."

This second Native Peoples Native Homelands Climate Change Workshop was an opportunity for Native people to contribute input to the development of future national and international policy and agendas at this very critical time in history. During the workshop, participants met in frequent plenary sessions for discussions of matters of general applicability as well as in breakout sessions organized by both geographic regions and issue areas. A special White House "Listening Session" was conducted by three representatives of the White House Council on Environmental Quality (CEQ) specifically to hear the direct experiences and concerns of Native Peoples.

In addition, NP/NH workshop attendees worked long hours to create a special document, "The Mystic Lake Declaration", which was presented – two weeks later - to a key meeting of world leaders from more than 190 countries on climate change at the 2009 UN Climate Change Conference in Copenhagen, Denmark (The 15th session of the Conference of the Parties to the UN Framework Convention on Climate Change). The Declaration, presented at the UN climate conference by Tom Goldtooth and a delegation from the Indigenous Environmental Network (IEN) contributed a powerful, unified indigenous voice on the importance of indigenous science and knowledge for addressing environmental and climate issues.

The workshop was supported by NASA's Tribal Colleges & Universities Project and Earth Science Division, working with partners from the American Indian Higher Education Consortium (AIHEC), Haskell Indian Nations University, Honor the Earth, the Indigenous Environmental Network, Intertribal Council on Utility Policy, the National Oceanic and Atmospheric Administration (NOAA), and many others. Areas of impact and adaptation considered in the workshop included water, agriculture and food, traditional plants and medicines, sacred lands and sites, subsistence economies, energy, housing, transportation, sustainable infrastructure, disaster planning and more.

Current and future American Indian, Alaska Native, and Native Hawaiian tribal leaders and practitioners, tribal elders, tribal college and university presidents, faculty, staff and students, national and international climate scientists and scholars, Indigenous leaders in climate related issues, government agencies, and university scholars all joined together to strengthen the voice of US indigenous people in the climate discussions at this very crucial time in history.

Chinook Blessing Litany

WE CALL upon the Earth, our planet home, with its beautiful depths and soaring heights, its vitality and abundance of life, and together we ask that it

Teach us, and show us the way

WE CALL upon the mountains, the Cascades and the Olympics, the high green valleys and meadows filled with wild flowers, the snows that never melt, the summits of intense silence, and we ask that they

Teach us, and show us the way

WE CALL upon the waters that rim the Earth, horizon to horizon, that flow in our rivers and streams, that fall upon our gardens and fields and we ask that they

Teach us, and show us the way

WE CALL upon the land which grows our food, the nurturing soil, the fertile fields, the abundant gardens and orchards and we ask that they

Teach us, and show us the way

WE CALL upon the forests, the great trees reaching strongly into the sky with Earth in their roots and the heavens in their branches, the fir and the pine and the cedar, and we ask them to

Teach us, and show us the way

WE CALL upon the creatures of the fields and the forests and the seas, our brothers and sisters the wolves and the deer, the eagle and dove, the great whales and the dolphin, the beautiful Orcas and salmon who share our Northwest home, we ask them to

Teach us, and show us the way

WE CALL upon those who have lived on this Earth, our ancestors and our friends, who dreamed the best for future generations, and upon whose lives our lives are built, and with thanksgiving, we call upon them to

Teach us, and show us the way

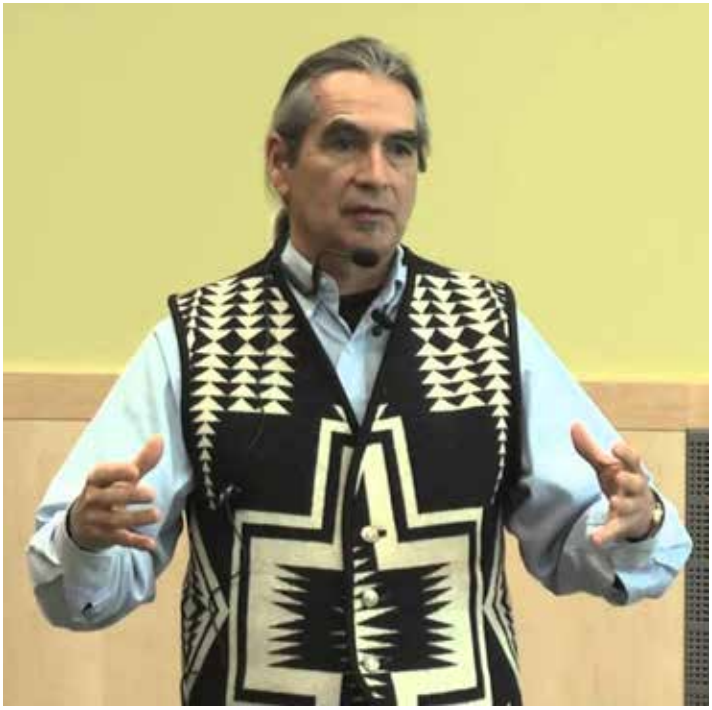
And lastly, WE CALL upon all that we hold most sacred, the presense and power of the Great Spirit of Love and Truth which flows through all the Universe ... to be with us to

Teach us, and show us the way

Chinook Blessing Litany
(Published in: "The Way: An Ecological World-View," Edward Goldsmith, University of Georgia, 1998, Author unknown).

Welcome from Workshop Co-chair - Dr. Daniel Wildcat

Dr. Daniel Wildcat (Yuchi member of the Muscogee Nation of Oklahoma) is a professor at Haskell Indian Nations University in Lawrence, Kansas. He is Director of the American Indian Studies Program, Co-director and co-founder of the Haskell Environmental Research Studies Center, and heads the American Indian and Alaska Native Climate Change Working Group. Dr. Wildcat is a scholar on indigenous knowledge, environment, and education. Dr. Wildcat has authored several books including his latest: Red Alert! Saving the Planet with Indigenous Knowledge.



Dr. Daniel Wildcat, Workshop Co-chair

"On behalf of my co-chair Winona LaDuke and the organizing committee, I want to welcome all of you to the Native Peoples – Native Homelands II workshop. It is incredible to see so many of our Peoples, friends and allies gathered here for fellowship, inspiration and, let's be honest, hard work. We have much to do in the face of accelerating climate change. Your work here - sharing what you are observing in your homelands and what you are doing to address the changes to the ecosystems and environments we acknowledge as consisting of relatives not resources, as Oren Lyons constantly reminds us - is important and much needed today.

Only eleven years ago, in the fall of 1998, the first Native Peoples – Native Homelands Climate Change Workshop was convened in Albuquerque as the first US National Assessment of the Potential Consequences of Climate Variability and Change was being developed. We now face a situation on the planet much worse than any scientific climate change forecasters predicted eleven years ago, but entirely consistent with centuries old prophesies and forecast by our Indigenous wisdom-keepers. It is now time for Indigenous Peoples and our allies to reconvene – gather as we have always done when situations required concerted action – to address the very real climate change threats our Peoples and homelands face.
In 1998 almost no one in the scientific community of the Unites States made the fundamental connection between Native Peoples and Native Homelands and climate change – not only with regard to impacts but more tellingly with respect to the deep knowledges and wisdom that resided in native homelands and with native peoples. We have a situation on the planet – our Mother Earth – that requires Native People to come together so we can acknowledge our inalienable responsibility to care for the beautiful and diverse life of our blue green Mother Earth. We must make sure the national governments of the world and their agencies, the United Nations, NGOs and the private sector recognize tremendous practical knowledge about the planet's situation and what might be done to address this already deadly global phenomena residing among American Indian and Alaska Native peoples who find their culture and identity emergent from the landscapes and seascapes they call home.

Several scientists did make the connection and with the leadership of Dr. Nancy Maynard worked mightily to bring the resources together to convene the first Native Peoples – Native Homelands Climate Change Workshop in the fall of 1998. The results of the first Native Peoples – Native Homelands Workshop were many: a recognition that Native voices and the wisdom and knowledges they conveyed were important, ***The Albuquerque Declaration***, and a final report ***Native Peoples – Native Homelands Climate Change: Circles of Wisdom.*** However, with a growing recognition that indigenous knowledges are the result of deep experiential spatial knowledges of a people and place this second workshop will capitalize on one of the most overlooked sources of wealth - our tribal colleges and universities.

The climate has indeed changed in the past decade in a social institutional and atmospheric sense. Tribal colleges and universities are now facilitating research on climate change-related issues and preparing our students to provide the critically needed professional and scientific expertise to serve our nations. In partnership with federal agencies, national scientific research centers, NGO's, and larger research universities tribal colleges and universities are creating the next generation of indigenous leaders, entrepreneurs, planners, scientists and teachers. Consequently, this second Native Peoples – Native Homelands Workshop will highlight the role of tribal colleges and universities (TCUs) in preparing our American Indian and Alaska Native peoples to address the dramatic climate change impacts many Native People have been observing on their landscapes and seascapes for decades.

Our Workshop goal is to analyze and examine climate change impacts on our Peoples and their Native homelands and, just as importantly, share sustainable strategies and technologies for addressing these climate changes. Our own indigenous languages and cultures hold great insight on how humankind might live well on this beautiful Mother Earth - even in dramatically changing conditions. Our histories are rich in examples of practical exercises of indigenous ingenuity – ***Indigenuity***.

So let us roll-up our sleeves and get to work. After our workshop a report will be completed and hopefully a "Mystic Lake Declaration" like the "Albuquerque Declaration" created at the last Native Peoples – Native Homelands workshop can be crafted by the workshop's end to help governmental agencies and the public understand indigenous insights and perspectives on climate change. This report and your first-person testimonies of what is happening "on the ground" where you live will also serve as useful guides for our indigenous nations' policy-making and program development and for governmental agencies and non-governmental organizations who want to work with our Peoples. Such documents will add a necessary addendum to the recently released national climate report. Thank you for traveling to join us. As the late Vine Deloria, Jr. noted, difficult problems require the engagement of our Spirit and Reason, so let's draw on both and get to work."

Indians have a shot at doing something great. Young Indians must take that chance and be brave, be strong. There is a war out there. You build something – like community gardens and wind turbines – and you liberate yourself and the Indians become the people they are supposed to be."

Special Perspective from Workshop Co-Chair - Winona LaDuke

Winona LaDuke (Anishinaabe from the White Earth reservation, Minnesota) is a Native American activist, environmentalist, economist, and writer. In 1996 and 2000, she ran for vice president as the nominee of the United States Green Party, on a ticket headed by Ralph Nader. Ms. LaDuke is Co-Chair of the Native Peoples - Native Homelands Climate Change Workshop, and executive director of both Honor the Earth and White Earth Land Recovery Project.

Winona LaDuke directed her comments mostly to the young people present and admonished them to be guided by their hearts and spirits, to use their brains because their communities – including those with wings and roots – need them.

"The impact of fossil fuels on our communities is a tough reality. But environmental problems could be worse; they would be worse if activism in the past had not stopped a 1979 proposal for 1,000 nuclear power plants by 2000 or a plan for a liquefied natural gas terminal off the coast of Santa Barbara, California, or the turning of a Hawaiian village into a tourist attraction.

It's time for Indians to reload. But this is not all about a battle. It is also about great love, and about where we are going. Indians are instructed to remember who they are and have that beauty way.

Because of sea level rise, the people of Tuvalu in the Pacific are shopping for a new island. Eleven thousand people have to find a new place to live. They are already refugees. They need new land.

A prophecy tells of a choice between two paths, one well-worn and scorched; the other green and not well worn. Almost every indigenous community has a similar prophecy at this time. Colonization has had an impact: Indians have become the indigenous people who want to consume more. But they are selling their land for it. Steve Newcomb had explained that the root "colon" in "colonization" means "to digest." Colonization is the digestion of one culture by another. Indians are at various levels of colonization, but they all have the power to liberate themselves, to know the difference between the green path and the scorched one. The pretense that nuclear power and carbon sequestration are green is the scorched path.

Winona LaDuke, Co-Chair

Indians must be the ones who go for the other path. They must remember who they are, create alternatives in their own communities, and be self-determining. The Creator intended for us to determine our destinies, not wait for permission from someone in Washington to control our destinies. Some tribes have taken control: The Little Traverse Band signed onto the Kyoto Protocol as a tribe. And the Navajo Nation passed the Navajo Green Economy Bill by grassroots efforts. Some tribes are putting up wind power projects. The leadership for that is coming from tribes.

What the next world will look like: We will not be an empire. We will remember who we are. Cultural diversity is essential in a sustainable future. Empire, which seeks to make more than is needed and to conquer, is not sustainable. Even indigenous people have to deconstruct their own ideas of empire, to go back to restoring what they take. A lot of the 50 million acres of Indian land that has been leased out could be recovered for organic farming, which returns carbon from the atmosphere to the soil, and for prairie. Deb Echohawk, who has Pawnee seeds and is growing them out, went back to Nebraska, from where

the Pawnee were forced out, and is working with the people there to grow corn from that native seed. That is how you make just relations with people. You give people a shot at redemption. Our seeds and plants like that.

Many Indian communities are growing seeds. They need to do it in greater quantities, with many varieties. Old varieties are drought resistant, pre-industrial, not addicted to fossil fuels. White Earth Reservation has a farm-to-school program, providing garden-grown food for schools. That means exercising jurisdiction over food. That's the answer. There is more pride in growing it than in buying it.

We are going to cut our consumption, take no more than we need. Consuming one-third of the world's resources, as the United States does, requires constant interventions into other people's countries and constant violations of other people's human rights. We have consumed half the world's oil and the rest of it is inaccessible. So we have to cut our consumption.

Food economy and energy economy studies on White Earth Reservation show that the community spends $8 million on food and 25% of its economy on energy. The result of spending this money off reservation is that the reservation loses half its economy. The answer: consume less and buy local. Solar heating panels installed on White Earth Reservation have cut down fuel bills. They are made locally. Young people are part of the effort; the community's intellectual capital is developed as they learn the work. Renewables are the future. Reservations are windy. There is plenty of solar. It's a rebooting of the reservation economy.

The reservation community needs 3.8 million wind turbines. That takes about as much land as Manhattan. Renewable energy is democratized, in that it is often locally owned, in solar panels and such things. The result of transforming the least efficient economy based on renewables will be people who have jobs and are not in jail.

Wind and solar technology is appropriate technology. We can have the intellectual capital for this energy economy, but training is needed. There are many Indian veterans of the U.S. military who have the technical knowledge needed to make it work. These things need to be taught at tribal colleges.

Indians have a shot at doing something great. Young Indians must take that chance and be brave, be strong. There is a war out there. You build something – like community gardens and wind turbines – and you liberate yourself and the Indians become the people they are supposed to be."

Foreward from Co-chair of 1998 NPNH 1 Workshop - Bob Gough

Bob Gough, Secretary, Intertribal Council On Utility Policy

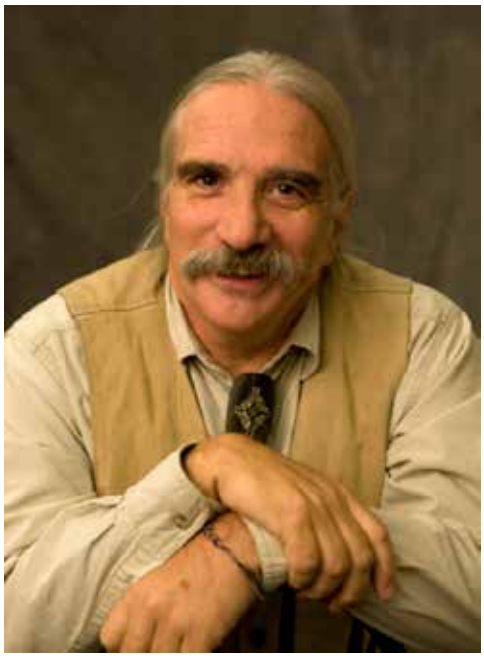
"Nature has no mercy; it has laws."
~ Chief Oren Lyons, FaithKeeper of the Onondaga.

"Humans may not be fully responsible for all of the sources of global warming, but we may well be the swing vote and our own best interests may be critically at stake."
~ Patrick Spears, President, Intertribal COUP

Given the involvement of the Intertribal Council On Utility Policy in both Native Peoples workshops, I greatly appreciate this opportunity to share some observations of that journey. This report shows some of the strides America's indigenous and federally recognized tribal sovereign communities have made in addressing the risks, uncertainties and extremes associated with the consequences of our placing our collective carbon blackened fingerprints on the firmament.

In early November 1997, Pat Spears, president of the Intertribal COUP and I traveled the ice-glazed county highways across open Dakota prairies to present on tribal concerns at the Northern Great Plains regional climate change workshop convened by the Upper Midwest Aerospace Consortium (UMAC) at the University of North Dakota, organized by its director, a most down-to-Earth astronomer named Dr. George Seielstad, and coordinated by NASA's indefatigable Dr. Nancy Maynard. Few tribal people attended, as there was little official concern for the scientific topic in reservation circles, though all experienced weather related impacts increasing at an accelerated pace. On the last day Pat spoke on tribal sustainable resource practices in the opening panel and at the end of the day I was in a break-out session on tribal and federal lands, discussing the contributions Native communities can make to adaptation strategies given the tremendously long histories of indigenous peoples on these lands.

New to the climate science community, we had come a long way learning their frameworks and sharing insights from ours. We were welcomed for our perspectives and informed about changes likely to occur in this century should humans continue on our ecocidal carbon energy path. Over the past two millennia the world's climate has been relatively calm and steady except for the two most recent centuries. However, due to accelerated warming from the increased combustion of fossil fuels, we have changed the very chemistry of our atmosphere, creating far greater risk of weather uncertainty, variability and extremes than we have ever collectively faced



Bob Gough, 1998 NPNH 1 Workshop Co-chair

With the close of this eye-opening workshop on that cold Friday night at a hotel blackjack table in Grand Forks, not seven months after the destructive spring flood left major parts of downtown in ashes and mud, the first "Native Peoples" workshop was conceived. In less than a year nearly 200 natives from homelands in Alaska, Hawaii, the U.S., Canada and Mexico would convene with climate scientists in Albuquerque, as Hurricane Mitch ravaged the Gulf coasts of North and Central Americas.

In Grand Forks we expressed our concern about the lack of government-to-government interaction with Tribes and tribal communities on climate issues. We sought broader participation from the federal treaty partners beyond only the Bureau of Indian Affairs, and proposed a series of comments and recommendations which made it into the Proceedings of the Northern Great Plains Regional Workshop (1998). We personally committed to a year-long run of activities supported by NASA aimed at attending as many of the remaining USGCRP regional workshops as possible, alerting Tribes and indigenous groups about the growing climate crisis and urging participation in both the remaining regional meetings and in the first NPNH gathering to be held at the end of October 1998, designated as the twentieth (and last) of the "regional workshops" of the U.S. Global Change Program series. Our "region" was Indian Country, encompassing virtually all of North America, where tribal communities could be found. Tribes -- lodged in the Rocky

Mountains and along the Gulf Coast; along the New England seacoasts, the Pacific Northwest and throughout Alaska, surrounding the Great Lakes, across the Great Plains, and in the desert Southwest – are as variable as they are vulnerable to the consequences of a warming planet. The gathering in Albuquerque was no small accomplishment and its proceedings can be found at:
http://www.usgcrp.gov/usgcrp/Library/nationalassessment/native.pdf

NPNH I helped tribal communities better understand the scientific explanations for changes, while often holding traditional cultural beliefs and understandings that can surpass the culturally bound mainstream beliefs in human superiority, our dependence upon technology and at time an apparent willful blindness to the consequences our actions and activities are having upon the very fabric of the long evolved ecosystems which have nourished and support life on this planet

During the planning of NPNH II, Pat Spears and I were engaged in a training program in building a demonstration high-performance straw bale house on the Sinte Gleska University campus on the Rosebud, where faculty from six tribal colleges worked with students over the summer to construct a two-bedroom home that would use 70% less energy to heat and cool. The passive, straw bale insulated house is one example of a hopeful strategy for an adaptive path for all peoples in the Great Plains, and one that can help bring resolution to some of the current crises in Indian Country, ranging from climate, energy, housing, health and unemployment.

Pat always emphasized the need to address not only how we can contribute to a sustainable economy for our children and communities, but also how we can contribute to the overall restoration of the Earth. When the call went out to convene Native Peoples, Native Homelands II, tribal colleges were the primary focus, with students and faculty making up a good portion of the 400+ participants. We reached out to over 30 tribal colleges and universities in the hope that our tribal youth could harness both the traditional and contemporary tribal values along with the necessary scientific skills and training to be of service to their communities, for theirs is the monumental task of identifying the vulnerabilities threatening cultural sustainability and survival. They must build the capacity to promote community resilience in the face of the new normals already loaded in the climate pipeline for decades to come.

At the close of those same six decades, my Kola and partner on the COUP Trail for over twenty year began his final journey in this life on the last weekend in June 2012, as a derecho, swept through DC. This fast-moving, long-lived, large and powerful thunderstorm complex, reminded many in our Nation's capital, as Pat did, of the many on this Planet who lack the technological advances that surround and comfort us and that our over-dependence on such technology will ultimately not shield us from the Natural Forces that abound on this Planet. It has been my honor to work with many fine people on issues of water, energy, indigenous rights, climate and environmental protection and restoration. As the visionary Pierre Teilhard de Chardin once said: "The future belongs to those who give the next generation reason for hope." Few had higher hopes for the indigenous peoples of this land. None will I miss more than my Kola Pat Spears.

Wopila Kola Pat! I honor your spirit in this work we have done. *Hecel Lena Oyate Ki. Nipi Kte!* -- So That the People May Live!

Background Information & Context for Workshop Discussions

Native Peoples - Native Homelands – The Name

The term "Native" was deliberately chosen to use in the title "Native Peoples-Native Homelands Climate Change Workshop." While American Indians and Alaska Natives are the largest and perhaps most widely recognized indigenous people living in North America, they are not the only indigenous people with geographic and political ties to traditional homelands within the political sphere of the United States of America, and thus, within the scope of the National Assessment on Climate Change. Although this Workshop pays particular attention to the issues raised by American Indians in Indian Country and Alaska Natives, it does so to highlight the nature of concerns and opportunities originating throughout indigenous America, so as not to exclude other participating indigenous groups, such as Native Hawaiian and various Caribbean or Pacific Islanders whose histories, cultures and climatic risk warrant thoughtful consideration in the National Assessment.

Native Peoples

Native Peoples, encompassing American Indians and the indigenous peoples of Alaska, Hawaii, and the Pacific and Caribbean Islands, currently comprise almost 1% of the US population. Another 0.7 percent of the population are those who reported a combination of races (e.g., Native American plus another race or races). A total of both American Indians and Native Alaskans alone or in combination is 1.7% of the population. (2010 Census Brief: Overview of Race and Hispanic Origin, Table 3.) Formal Tribal enrollments total approximately two million individuals, of which more than half live on or adjacent to hundreds of reservations throughout the country, while the rest live in cities, suburbs, and small rural communities outside the boundaries of reservations. The federal government recognizes the unique status of more than 566 Tribal and Alaska Native governments as "domestic dependent nations." http://www.bia.gov/WhatWeDo/index.htm OR http://www.bia.gov/FAQs/index.htm The relationships between tribes and the federal government are determined by treaties, executive orders, Tribal legislation, acts of Congress, and decisions of the federal courts. These actions cover a range of issues that will be important in adapting to climate change, from responsibilities and governance to use and maintenance of land and water resources.

The number of Native Americans and Native Alaskans depends on the definition that is used. As a result, the number of those counted as Native Americans and Native Alaskans can vary based on differences, and even changes in federal, Tribal, and state legislation, and the policies of governments at several levels. For example, the U.S. Bureau of the Census counts as American Indian anyone who identifies him or herself as such. As in asking about other ancestral connections, census enumerators require no proof of Indian identity. Thus, census data include individuals who may identify themselves culturally and socially as American Indian, but who are not formally enrolled as a member of a particular tribe. As a result, the census produces a comparatively high count of the number of American Indian people in the United States (U.S. Bureau of the Census, 2010). The Bureau of Indian Affairs (BIA), on the other hand, counts only individuals with a sufficient blood quantum of 25% or more and who are officially enrolled as members of federally recognized tribes.

Each tribe has the right to establish its own criteria for enrollment. Most tribes require that a certain percentage of the individual's ancestors must have been members of that tribe. Some tribes recognize only affiliation through one parent's family. Still other tribes have residency requirements indicating that the individual must live on the tribe's reservation for a specified number of years. In the latest BIA report, "American Indian Population and Labor Force" (2005), the total number of enrolled members of

the (then) 561 federally recognized tribes was shown to be less than half the Census number, or 1,978,099, (see http://www.bia.gov/FAQs/index.htm) thus yields a lower number of American Indians. As a further complication, some tribes are recognized by state governments, but not by the Bureau of Indian Affairs (e.g., the Lumbee of North Carolina). Members of these tribes are, therefore, recognized as Indian by some levels and agencies of government, but not by others. Periodically, a tribe may succeed in completing the BIA's rigorous process for obtaining federal recognition, thus increasing the number of Indian people recognized as such by the Department of the Interior. Further, descendants of the original inhabitants of the Hawaiian Islands have, using the Department of the Interior's own criteria, made credible claim for federal recognition as Native Americans (Bordewich, 1996).

The presence of non-Native Americans on reservation lands was largely prevented until passage by the Congress in 1887 of the Dawes Severalty Act, commonly called the Allotment Act. Prior to this law, reservation lands were held corporately by an entire tribe and no particular individual held title to any particular tract of land. Furthermore, no outsiders, except government officials and soldiers, were permitted to live within reservation borders. The Allotment Act, however, mandated that each member of a tribe receive an individual allotment of land. The allotments varied in size from 80 to 1,040 acres, depending on the particular reservation. After each head of household and family member had received an allotment, the remaining unassigned lands within the boundaries of each reservation could be opened to non-Indian homesteaders.[1] These settlers were granted clear title to the lands on which they settled if they fulfilled the normal conditions of homesteading. Land that was conveyed in this way to homesteaders was simply subtracted from the total lands that had been originally reserved for the tribe. As a result, until the passage of the Indian Reorganization Act in 1934, significant amounts of reservation lands passed out of Indian ownership even though they were within the original boundaries of reservation.

Native Homelands

Tribal land holdings in the 48 contiguous states currently total about 56 million acres, or about 3% of the land. Additionally, Alaska Native corporations hold approximately 44 million acres of land. Despite the relatively extensive total land holdings, most individual reservations are small, supporting communities with populations of less than 2,000. Larger reservation populations are exceptional, but range as high as 200,000 people living on the Navajo Reservation. The geographic distribution of American Indian and Native Alaskans are concentrated in the West with 41 percent of the American Indian and Alaska Native alone-or-in-combination population. The second-largest proportion is the South, then the Midwest and the Northeast. (2010 Census Brief, "The American Indian and Alaska Native Population: 2010").

The federal government has recognized that tribes and Tribal governments also have legal rights in territories that lie beyond the boundaries of their respective reservations. For example, treaties in the Pacific Northwest and the north-central states of Minnesota, Wisconsin, and Michigan recognize rights of tribes to fish, hunt, and gather off-reservation. Further, federal legislation has recognized Tribal interests in historical and cultural interest areas beyond reservation boundaries. These interest areas cover a significant fraction of the 48 contiguous states, generally matching the "Native Homelands" that Native Peoples inhabited prior to or since European settlement.

With the beginning of clearly observable climate change, and because of the relationships of plants, water, and migrating wildlife with ecosystems outside reservation boundaries, the potential consequences of climate change create significant interest among Native Peoples. These interests arise because the consequences will affect both their reservation lands and the much larger land areas encompassed in the concept of Native Homelands. While each tribe will face its own challenges, this workshop focused on a few general issues facing large numbers of Native Peoples, particularly American Indians. More region-specific issues are covered in the various regional sections of the assessment report, notably in those dealing with the Northwest, Alaska, and the Pacific and Caribbean Islands.

Note: More data on American Indian and Alaska Native populations can be found on http://factfinder.census.gov/home/aian/index.html (Census Bureau Guide, "A Compass for Understanding and Using American Community Survey Data: What Users of Data for American Indians and Alaska Natives Need to Know, October 2009.)

1 Many tribes were able to avoid the allotment of Tribal lands. The reservations of the Red Lake Chippewa in Minnesota, the Menominee Nation of Wisconsin, several Pueblo tribes and a large portion of the Navajo Nation remain undivided and intact within their original borders.

Introduction and Background Information
U.S. National Assessment

Reprinted from the USGCRP "Background Information" for the Climate Change Impact on the United States called for by a 1990 law, U.S. National Assessment Coordination Office, available at http://www.globalchange.gov/publications/reports/scientific-assessments/first-national-assessment

Why a National Assessment?

To Prepare the Nation for Future Change: To assure that the United States is prepared for future change, the United States Global Change Research Program (USGCRP) initiated a national assessment on the potential consequences of climate variability and change for the nation. The national assessment process analyzed and evaluated what is known about the potential consequences of climate variability and change for the nation, in the context of other pressures on the public, the environment, and the nation's resources.

Responsive to Congressional Needs: The USGCRP is mandated by statute with the responsibility to undertake scientific assessments of the potential consequences of global change for the United States in the "Global Change Research Act of 1990" (P.L. 101-606), which states the federal interagency committee for global change research of the National Science and Technology Council "shall prepare and submit to the President and the Congress an assessment which –

- integrates, evaluates, and interprets the findings of the Program and discusses the scientific uncertainties associated with such findings;

- analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and

- analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years."

Providing Input Into the Intergovernmental Panel on Climate Change: The [first] national assessment was timed to provide input to the Third Assessment Report of the UNEP/WMO Intergovernmental Panel on Climate Change (IPCC), which has been working to integrate more regional detail into its analyses.

Involving Stakeholders from a Broad Spectrum of Society: The national assessment process has involved a broad spectrum of stakeholders from state, local, Tribal, and Federal governments; business; labor; academia; non-profit organizations; and the general public.

Linking Scientists and Stakeholders: The assessment is linking research by scientists to specific needs of the stakeholders; and is providing planners, managers, organizations, and the public with the information needed to increase resilience to climate variability and cope with climate change.

Scientific Excellence Combined with an Open and Participatory Approach: The national assessment has been founded on the principles of scientific excellence and openness, and will be integrative and iterative.

The National Assessment Process

To help prepare the nation for climate variability and change, the USGCRP, in cooperation with the Office of Science and Technology Policy (OSTP), has engaged in a comprehensive planning effort to implement a national assessment process. These efforts began in early 1997 with a series of regional workshops, and have included a National Forum, intensive sessions of team leaders and advisory bodies, and extensive discussions among federal agencies, the science community, stakeholder communities, and the interagency committee for global change research. A high priority was placed on the process of engaging a network of stakeholders in a dialogue about vulnerabilities and coping mechanisms. The goal was to begin a two way process of interaction: scientists gain input from the stakeholders about their information needs, and the stakeholders learn from the scientists about climate change projections, and possible consequences in the region.

The U. S. National Assessment & Native Peoples and Native Homelands

In the late 1990s, the planning efforts resulted in the first comprehensive "National Assessment of the Potential Consequences of Climate Variability and Change in the United States." Between 2004 and 2009, the Climate Change Science Program (CCSP), which incorporated the USGCRP, produced a series of 21 reports called Synthesis and Assessment Products (SAPs) all of which addressed critical aspects of climate change in the United States. One of the most significant documents produced by the USGCRP, "Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change" (The Foundation Report), provided the scientific underpinnings for all aspects of the US National Climate Assessment in 2001. This document is of special significance for Native peoples because a full chapter in that report is devoted to "Potential Consequences of Climate Variability and Change for Native Peoples and Homelands," which was based upon the discussions which took place at the Native Peoples Native Homelands Climate Change Workshop in 1998. (Houser et al, 2001).

The second Native Peoples Native Homelands workshop in 2009 was designed to contribute new and updated information to the U.S. National Assessment process and to the international climate assessments and discussions on the impacts of climate change and extreme weather on Native Peoples and their homelands and to propose strategies for addressing the impacts of these changes. It is clear that some of the discussions which took place at the NP/NH workshop laid the groundwork for direct contribution to the new U.S National Climate Assessment – to be published in 2014 - because it includes an entire chapter in the new assessment on "Indigenous Peoples, Lands, and Resources." Furthermore, the "Mystic Lake Declaration," written by workshop participants, promoting a more sustainable world using indigenous science and knowledge, was officially presented 2 weeks after the workshop at a key UN climate change conference of world leaders from more than 190 countries in Copenhagen, Denmark, "the 15th Sessions of the Conference of the Parties to the UN Framework Convention on Climate Change."

Historical Context

Reprinted from Chapter 12 of Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change, Houser et al (2001).

Over the last 500 years, essential environmental balances that had sustained Native peoples in North America for many millennia began to rapidly shift. Forests were cut for homesteads and farming. Alien plants displaced grasslands. Dry lands flooded, rivers changed their courses, and ponds and swamps drained away as watercourses were dammed and channeled. Important providers of nourishment and protection – buffalo, salmon, eagle, wolf, and shad – were pushed to near extinction. New and strange creatures – horse, cow, pig, sheep, and pheasant – shoved aside indigenous species and came to dominate local economies. Exotic new diseases eradicated whole villages. Tribal social, political, cultural, and spiritual relationships throughout entire regions collapsed. Spiritual leaders lost their followers. Communities – even entire Tribal nations – were extinguished or forced to relocate.

Five hundred years ago, the population of Native peoples in North America is thought to have ranged between about 10 and 18 million. By 1890, the population of Native peoples on the continent had dropped to only 228,000 and was declining at an average rate of between 500,000 and 850,000 individuals each 20-year generation between 1500 and 1890 (Snipp, 1991). Some thoughtful leaders predicted that Native people would soon disappear. However, those who predicted the 'vanishing of the Red Man' substantially underestimated the endurance and adaptability of Native peoples, and the strength of Native perspectives and values. Over the last 100 years, the population of Native peoples has grown almost ten-fold as Native communities have been rebuilt, artists and craft workers and writers have created a renaissance of beauty and meaning, and economic development has accelerated (Cornell, 1998). The environmental changes that drastically altered the lives and circumstances of Native peoples as a whole between 1492 and the present did not arise from changes in the global climate, although there were some influences at the regional level. However, as Native peoples were displaced and national development occurred (Brown, 1991), Native peoples experienced continental-scale changes in their surroundings that are not unlike the types of changes that all Americans, indeed, all peoples may face in coming decades. The changes were substantial in magnitude, surprising in their occurrence, unmanageable by available technologies and existing forms of government, and irreversible. In those respects, the changes may provide insights of the kinds of transformations – cultural, economic, and social – that global changes in climate may bring, both for Native peoples and for America as a whole.

Geographical and Socioeconomic Context

Reprinted from Chapter 12 of Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change, Houser et al (2001).

The lands held by Native peoples are extensive. In addition to the 40 million acres of land held by Alaska Natives, Tribal lands in the rest of the US currently total about 56 million acres (Department of the Interior, 1996). The lands outside Alaska amount to about 3% of the land area of the 48 contiguous states, or approximately the size of the state of Minnesota. The largest portion of Indian lands are held on reservations, so named because they consist of lands that were reserved for the sole use and occupancy of Indian peoples from the vast expanses of land which were ceded to the United States government (Brown, 1991). Property ownership by Native peoples of the Pacific and Caribbean islands varies greatly because of the variety of situations, including traditional rights and historical legal rights. As indicated in the Islands chapter, however, on some islands lands are overseen by clans with responsibility for stewardship on behalf of their members whereas on other islands there are no longer reserved land rights.

By far the majority of reservations are small, both geographically and demographically, with populations less than 2,000 (Tiller, 1996). These lands, although they are owned by tribes or individual Indian people, are held in trust for the owners by the Federal Government, in the same way that a trustee might hold property for an heir until that individual comes of age and can take personal management of the property. One result of this system of trusteeship is that tribes and individual Indian people have had very limited control over the use, environmental management, or profits of their own lands. For much of the 20th century, in fact, many of the decisions over these matters rested with the Federal Government, not with the tribes themselves. Only in the last several decades have Tribal governments taken over more control of and responsibility for their lands.

From the most basic perspectives of the American legal system, reservations may be viewed as jurisdictional islands, largely exempt from the laws of the states that surround them due to the fact that the federal trust relationship preempts state law, unless states have been specifically delegated governmental authority by Congress. Tribal governments hold the authority within the reservations to levy taxes, regulate commerce, pass and enforce civil and criminal codes and, in principle, regulate the use of Tribal lands and water. While federal laws prevail, state authorities generally have no rights of enforcement within these jurisdictional islands.

However, from the perspective of Tribal environmental and land management policies and practices, the paradigm of reservations as islands is inadequate. First, the paradigm is inadequate environmentally because these 'islands' are surrounded not by oceans, but by land, and so these lands are intimately tied to the forests, grasslands, watersheds, and other ecosystems surrounding them; thus, the changes on Native and surrounding lands will be closely coupled. Second, because many reservations have considerable populations of non-Indians residing within the exterior borders of reservations the paradigm is inadequate administratively. Third, throughout the country, non-Indians also work on Indian lands because of the leas¬ing of Tribal lands to non-Indian farmers and ranchers – or, in the case of Agua Calienta, near Palm Springs, California, for example, for commercial development. The leasing of reservation lands is a long-standing practice and a vital source of income to the Indian landowners (Lawson, 1982). Complicating matters further, a major portion of the lands that were allotted to Indian heads of household are now managed either by the BIA or by the appropriate Tribal government. This land is also frequently leased to non-Indian farmers or ranchers with the proceeds from the leases then being divided among the descendants of the original allottee. Maps of land ownership and Tribal jurisdiction on many individual reservations thus resemble checkerboards, greatly complicating planning efforts.

At the same time, judicial decisions have sharply limited the jurisdiction of Tribal governments and Tribal courts over the activities of non-Indians.

As a result, many tribes face severe legal difficulties in creating or enforcing comprehensive plans for land use or natural resource management, a situation that will complicate planning for climate change. For example, if a Tribal government creates an environmental code, enforcement over an entire watershed or forest may be impossible without the voluntary consent of non-Indian owners of property within and outside of reservation boundaries. If a tribe leases cropland, grazing rights, or timber to non-Indians, environmental regulations can conceivably be written into the terms of the leases, although long-term traditions are likely to be difficult to change and the practical job of enforcing new regulations is likely to stretch the resources of small and understaffed Tribal governments (Getches, 1998; Pevar, 1992).

Tribal governments also have some legal rights in lands beyond the boundaries of reservations – rights that may establish precedents for collaboration on issues involving climate and environmental changes. For example, the Federal Government has recognized historical and cultural interests of tribes and Tribal governments in broader regions, often called "Native Homelands," which include lands occupied by Native peoples at present or in the past. Within the pre-determined boundaries of historical and cultural interest areas (generally homeland areas inhabited by a particular Native people prior to contact with Europeans), tribes are entitled, for example, to establish claims to human remains if evidence of kinship or ancestry can be established. These historical and cultural interest areas cover a significant fraction of the 48 contiguous states widening greatly the areas of interests of Native peoples.

Climate and Ecological Context

Reprinted from Chapter 12 of Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change, Houser et al (2001).

Native homelands are present in all of the major ecosystems across the US, including the unique environments represented by Alaska and the islands of the Pacific and Caribbean regions, and Native peoples have been experiencing the vagaries of climate on this continent for many thousands of years. The resource-rich environments created by the woodlands of the northeastern, southeastern, and Great Lakes regions, especially the presence of deer, rabbit, beaver, fish, berries, and many other resources, allowed tribes to occupy particular regions for long periods through the establishment of villages. The Great Plains provided a source of buffalo, deer, berries, and grains, along with fish and other resources, but the wide range of climate extremes, the migration of the herds and differential availability of plant resources, caused these tribes to need to be relatively mobile in order to survive. The western US provided a wide array of enviroments, from coastlines to mountains and river valleys to deserts, and are now home to the greatest number of Indian reservations. The Native peoples of Alaska have developed a lifestyle that depends, in large part, on there being very cold winters. Those living on islands depend on the reliability of the rains, being adversely affected by both too much and too little precipitation.

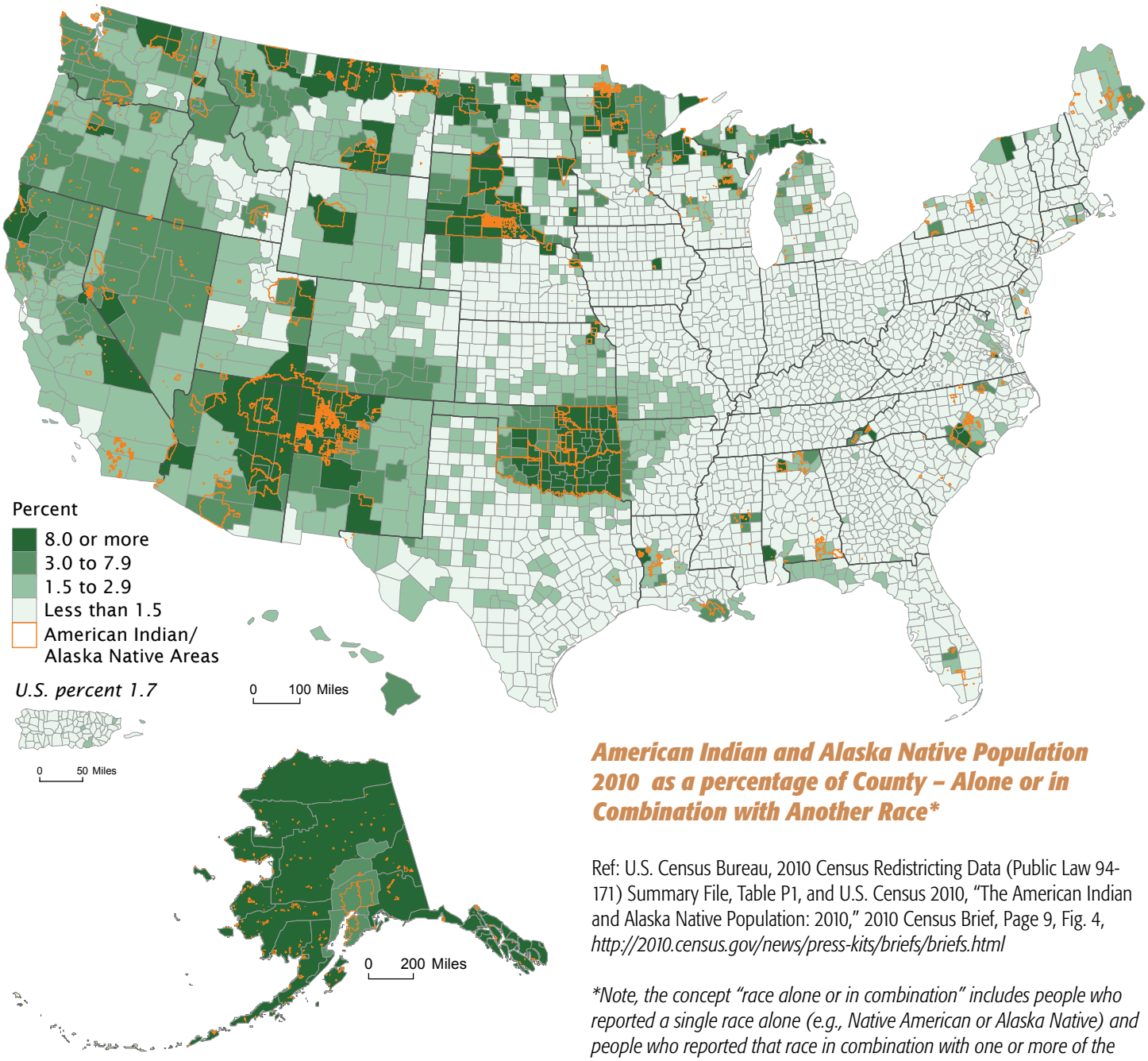
These adaptations, and the histories of the experiences and the lessons that have been learned about coping with climate fluctuations, have sustained Native cultures through many generations. Native oral histories are now being linked with past climate data derived from tree rings and other sources in ways that enrich our understanding of past climatic conditions. Oral histories often correlate with events identified in the geological record, such as periods with high or low rainfall, periods of warm or cold winters, and periods of flooding or drought (e. g., Deloria, 1997). What makes these histories especially valuable is that they often record not only the consequences of these climate fluctuations for people and for the environment around them, but also the responses that helped the communities to adjust and survive. Thus, where elements of traditional culture are still strong, the retelling of these events by Tribal elders over generations has created a populace that is relatively well informed about how to adapt and is generally well prepared to accept that extreme climate fluctuations are likely to recur.

There is, however, one key change that will limit the application of some of the lessons to the issue of climate change and is likely to create greater vulnerability than in the past. Earlier coping strategies of Native peoples, on which many of their histories and traditions are based, relied on shifting and moving, sometimes from one food source to another, sometimes from one place to another, or sometimes to find alternative sources of food and water or to intersect with the annual migrations of wildlife. In the Southwest, archeological evidence and Native oral histories indicate that the great regional drought of the 13th century caused the ancestral Pueblo People to abandon their permanent homes in the mesas and valleys of marginal areas. When the ability to cope in one place was exceeded, Native peoples moved, later returning if and when climate permitted.

Over recent decades, Native peoples have been observing that changes in the environment have been occurring, some due to regional to global-scale changes in the climate and some due to changing practices of land management and use. These changes are indicated as much by how Native peoples are changing their practices as by observations of the changes themselves. In north-western Alaska, for example, elders lament that winter temperatures have become so warm (now typically only -20°F instead of -70°F) that the traditional ecosystem on which they have depended for generations is deteriorating and is no longer able to provide the needed resources. In the Southwest, recollections by elders (corroborated by Army records from the early 1800s) are of valleys full of tall sacaton grasslands, whereas the region now is scarred by deep arroyos and supports only sparse vegetation, likely as a result of overgrazing and subsequent drought. All across North America, Tribal histories indicate that change is occurring. Native peoples today feel increasingly vulnerable to significant environmental changes because they are no longer able to cope easily with changes by relocating. Few contemporary tribes can afford the purchase of large tracts of new land, and federal laws

hinder the transfer or expansion of Tribal jurisdiction. Tribes therefore see their traditional cultures directly endangered by the magnitude of the projected climate change. Had the ancient Anasazi been compelled to remain in place, the culture and way of life of an indigenous people that can be traced back thousands of years would likely have been lost forever. This history provides a context for thinking about the potential consequences of future changes in the climate.

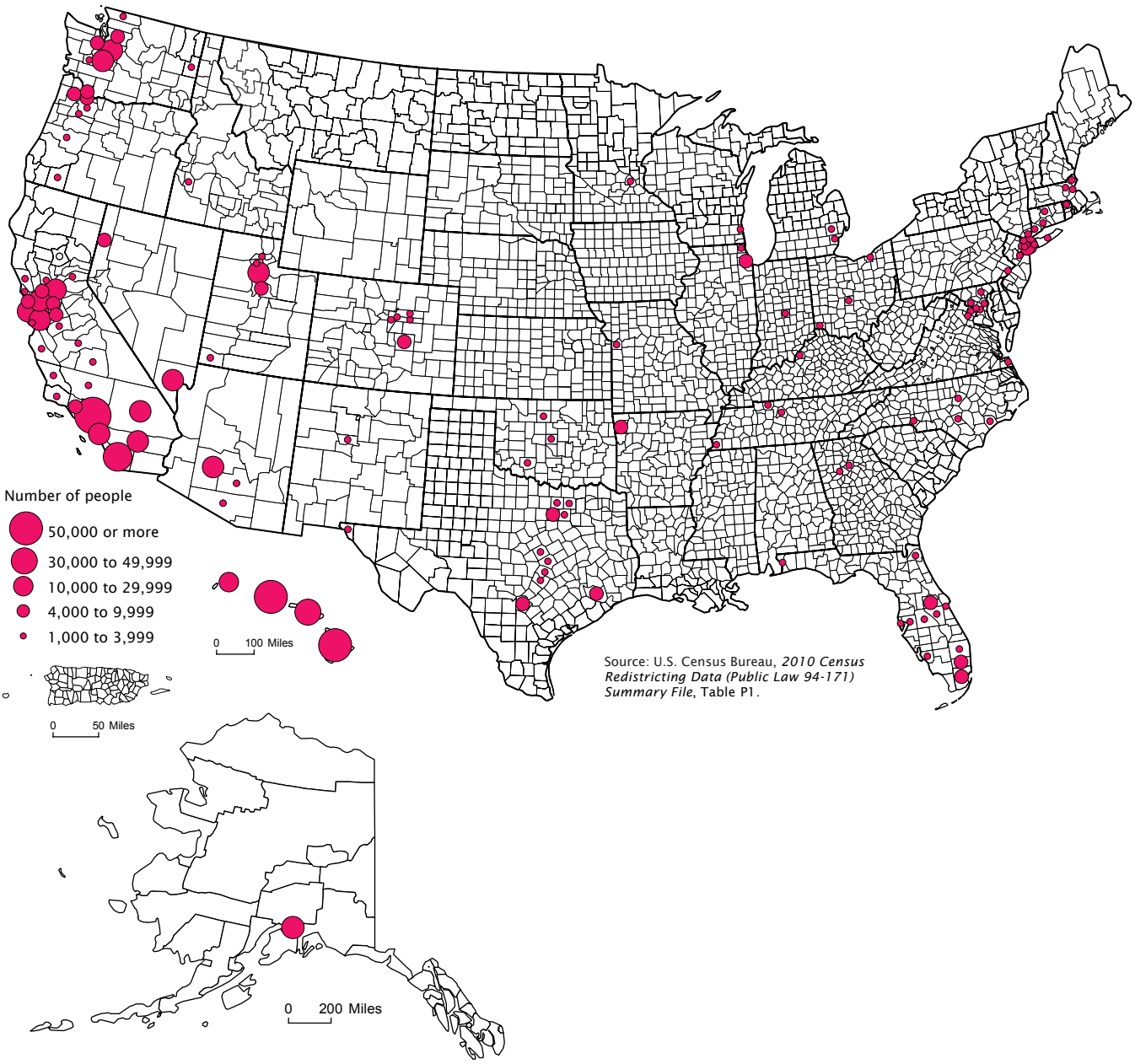
Maps



American Indian and Alaska Native Population 2010 as a percentage of County – Alone or in Combination with Another Race*

Ref: U.S. Census Bureau, 2010 Census Redistricting Data (Public Law 94-171) Summary File, Table P1, and U.S. Census 2010, "The American Indian and Alaska Native Population: 2010," 2010 Census Brief, Page 9, Fig. 4, *http://2010.census.gov/news/press-kits/briefs/briefs.html*

**Note, the concept "race alone or in combination" includes people who reported a single race alone (e.g., Native American or Alaska Native) and people who reported that race in combination with one or more of the other major race groups. The concept "race alone or in combination," therefore, represents the maximum number of people who reported as that major race group, either alone, or in combination with another race(s).*



Native Hawaiian and Other Pacific Islander Alone or in Combination by County: 2010

Counties with a Native Native Hawaiian and Other Pacific Islander population of at least 1,000 are included in the map. For information on confidentiality protection, nonsampling error, and definitions, see *www.census.gov/news/prod/cen2010/doc/pl94-171.pdf*

** The concept "race alone or in combination" includes people who reported a single race alone (e.g., Native American or Alaska Native) and people who reported that race in combination with one or more of the other major race groups. The concept "race alone or in combination," therefore, represents the maximum number of people who reported as that major race group, either alone, or in combination with another race(s).*

Workshop Format

The Native Peoples-Native Homelands Climate Change Workshop II was designed to significantly increase the Native stakeholder contribution to the ongoing US National Climate Assessment process and discussions, by bringing together Native expertise and information from across the entire United States and various Pacific and Caribbean Islands.

Plenary & Breakout Sessions

During the workshop, participants met in frequent plenary sessions for discussions of matters of general applicability as well as in breakout sessions organized by both geographic regions and issue areas. The geographic regions selected were the same regions designated by the US National Climate Assessment so that the observations and information from this workshop could be easily utilized by future US National Assessments. Due to the fact that this workshop attracted primarily Native participants from only several of the US Assessment major regions in the US, the breakout groups combined a number of the regions in several cases for efficiency of discussions. The primary issue area breakout groups were: water resources, food production, sacred sites, protection of habitats, clean energy (solar, wind), transportation, housing and sustainable community development, and education and training.

Discussions were focused around 4 questions:

1. What are the current stresses and concerns in tribal and Native lands across the country?

2. How might climate variability and change impact these stresses?

3. What kinds of coping options and adaptation strategies are available?

4. What is needed in your region to implement these coping and adaptation strategies?

White House "Listening Session"

A special White House "Listening Session" was conducted as a follow-up to the White House Tribal Summit in November of 2009 to hear the direct experiences of Native Peoples disproportionately suffering the adverse effects of climate change. Three representatives of the White House Council on Environmental Quality (CEQ) listened to the concerns of a large number of attendees, which ranged from sustainable housing and energy to indigenous food production to federal policies and adaptation strategies.

"Mystic Lake Declaration"

Throughout the workshop, many of the attendees also participated in the collaborative production of a powerful, unified document, the "Mystic Lake Declaration", to offer indigenous perspectives and solutions that can help tribal communities and policy makers formulate plans to address growing climate change impacts that severely threaten the traditional cultures and life ways of indigenous peoples. The Declaration, released on the last day of the workshop, was formally presented two weeks later to a key meeting of world leaders from more than 190 countries on climate change at the 2009 UN Climate Change Conference in Copenhagen, Denmark.

The results of these meetings, discussions, and writing sessions are summarized in the following pages.

An Alaskan Perspective

"Climate Change Impacts in the Arctic" – Captain Eugene Brower

"I appreciate the opportunity to speak with you today. It means a lot to me and to the people I represent, because it gives us a chance to share an Arctic Alaska Native perspective that you might not hear very often. And it allows me to tell you about our experiences as observers and stewards of the environment along the northern coast of Alaska, which is the story of traditional Inupiat Eskimo knowledge and western scientific knowledge coming together to inform public policy."

Captain Eugene Brower

Captain Eugene Brower, International Whaling Commission

Captain Eugene Brower has an extensive background in subsistence whaling and, because of this experience, was appointed to the US Delegation to the International Whaling Commission (IWC) on which he has served for many years.

I appreciate the opportunity to speak with you today. It means a lot to me and to the people I represent because it gives us a chance to share an Arctic Alaska Native perspective that you might not hear very often. And it allows me to tell you about our experiences as observers and stewards of the environment along the northern coast of Alaska, which is the story of traditional Inupiat Eskimo knowledge and western scientific knowledge coming together to inform public policy.

Briefly regarding my background, I was born in Barrow Alaska to the late Harry and Annie Brower Sr. in 1948. Harry and Annie had ten children. I was raised 40 miles south of Barrow along the Inaru River in a sod home living a subsistence lifestyle. Four other families lived in the area. Subsistence hunting and fishing followed a seasonal cycle; it was a hard but satisfying life. In the mid-1950s the Federal Government required compulsory education for all Alaskans. The family moved to Barrow when I was around seven years old, so I and my siblings could get an education. My father supported his family by continually going out hunting marine mammals, hunting and trapping and generally living off the land and rivers.

Since there were no high schools in Barrow, I went 1000 miles south to the Mt. Edgecumbe boarding school in Sitka, Alaska. After finishing high school in 1967, I went on to Haskell Institute, now known as Haskell Indian Nations University. I majored in electronics and graduated in 1969 and went to work for Argonne National Laboratories in Idaho Falls, Idaho. After a short time I returned home to Barrow and went to work for FAA as an electronic technician in 1970 and worked until fall of 1975 when I went to work for the newly formed North Slope Borough as a heavy equipment operator. I quickly rose in different positions within the Borough and was elected Mayor in 1981. I went on to work for different construction companies then returned back to work for the North Slope Borough to the Fire Department. I again worked up through the ranks to become Fire Chief until I retired in 2005.

I have been a subsistence hunter all my life. Starting at the age of eight, I joined my father's whaling crew and had to learn all aspects of whaling: sea ice formations and movements, sea currents, whale behavior, mushing, and many other things. My Captain and co-captain grilled me each whaling season asking if I remembered what I had been taught the year before. Whaling is learned by seeing and doing. Because of my background in subsistence whaling, I was appointed to the US Delegation to the International Whaling Commission (IWC) and have served for many years.

Let me start with some quick background about the Inupiat Eskimo people and the North Slope Borough for many of you here today who I'm guessing are not very familiar with northern Alaska. Then, I'll talk about our local observations with respect to climate change. Finally, I'll talk about the need for interaction between western researchers and local people to work together now that scientific and public attention is focused on the Arctic; and I'll give some concluding statements.

As most of you know, the Inupiat have lived along the Arctic coast for thousands of years. Nobody told my ancestors about the four basic food groups – the ones we learned about as kids in school. Three of those food groups were tough to find in the Arctic – dairy, grains, and fruits and vegetables. For the Inupiat, survival depended almost entirely on the nutritional value of bowhead whales, caribou, fish, migratory birds and other wildlife. So our people became keen observers of the natural world in the far north. From generation to generation, they handed down all kinds of practical information about the habits and migratory patterns of the animals that sustained them. They witnessed the effects of unusual weather or shifting ice conditions and variations in snowfall or temperature over the years, and they passed it on to the young people.

As some of you may know, the North Slope Borough is the largest municipality in the United States, in terms of landmass. It was established as a first class borough in 1972 and a Home Rule Charter was adopted in 1974. The Borough is the regional government

for the eight villages within the 89,000 square miles of northern Alaska, from the Brooks Mountain Range north to the Arctic Ocean. The populations of our villages range from 260 in Pt. Lay to about 4,500 in Barrow. In total we have approximately 7,500 residents, of which 70 percent are Inupiat.

Oil and gas resource development projects are the greatest source of property tax revenues for my region. With these revenues, the Borough has provided many services to our residents that had been taken for granted in most areas of the country and in urban Alaska for decades, if not longer. These include improvements in sanitation, water and sewer systems, education, public safety, and health and cultural services. In addition to providing public services and jobs, the Borough has always taken on as a primary responsibility the protection of our subsistence resources, their habitats, and the traditional Inupiat way of life.

The practical environmental knowledge I spoke of earlier has merged with our cultural practices through the centuries to create a different sort of management plan – a set of rules that reflect both science and spirituality. It really shouldn't even be called 'management', because that suggests that humans are in control. Stewardship of the environment is built into our culture, because for centuries we were almost entirely dependent on wildlife for food and clothing. The original Inupiat environmentalism had its roots in a spiritual connection to the animals our ancestors hunted. Because of this profound connection, our hunters observed the animals very closely and developed an environmental knowledge that passed from generation to generation. Traditional Eskimo belief regards the wildlife as our equals and as partners in the hunt, because they give themselves to us. So hunting is not just a harvest, it's a relationship of respect between the hunter and the hunted. Our subsistence practices are based on centuries of careful observation and a profound appreciation for the animals and the natural forces that have allowed our people to survive in one of the toughest places on earth.

This is fundamentally different from western science. As you know, western science gets its authority by being detached and observational. On the other hand, traditional knowledge is engaged and participatory. It contains information that is useful to western science, but it is actively connected to our cultural values.

This difference has made it difficult for scientists to figure out how to make use of indigenous knowledge. And the detachment of western science made it difficult for Native people to appreciate the useful applications of science in our world.

But western science and traditional Native knowledge have important similarities. When it comes to wildlife management, western science is based on the principle that wildlife should be available for future generations. That's why scientists study these various animal species. Traditional Native knowledge has the same motivation. Protection is the underlying value in both cultures, and that is where we come together.

Sometimes it's also where we split apart. In 1977, the International Whaling Commission declared a moratorium on aboriginal subsistence hunting of bowhead whales. I'm sure you can imagine how that news was received by our people. If you want to start a war in Eskimo country, just tell people they can't go whaling. The IWC's decision was based on the best available scientific estimates of the size and health of the bowhead whale population. The problem is those estimates weren't very good, because very little scientific research had been done on the bowhead. The observations of our whalers suggested that the IWC's population estimates were way too low.

At the same time, our harvest levels in the late 1970s were pretty high by local historical standards, so there was a legitimate reason to take a hard look at the long-term health of the herd. But we had no formal, ongoing communication with the scientific community, so there was no way to bring together these two different ways of understanding and interpreting knowledge.

That 1977 bowhead harvest crisis was a real turning point for science, for policymaking and for cross-cultural communication in the Arctic. It led to international acceptance of a unique management agreement between the federal government and the Alaska Native whaling community. The Alaska Eskimo Whaling Commission – AEWC – was formed as a vehicle for local management of the aboriginal hunt by the whalers themselves. The International Whaling Commission established a quota system, and the AEWC monitored the hunt and enforced the quota.

It was a very smart solution. As whaling captains, we knew that if we didn't do the job right, the feds would be forced to take over the program. The feds supported this self-management plan because they didn't particularly want to manage the hunt along 1,000 miles of ice-infested coastline. And the IWC accepted the arrangement as long as the federal government took ultimate responsibility for it.

That experience was a real wake-up call for us. It convinced us that we had to begin talking to the international community in a language it understood and accepted – the language of science. So the North Slope Borough established a Department of Wildlife Management and hired biologists to gather data and conduct research on the wildlife populations in our region. We partnered with the federal and state governments whenever possible, and we took responsibility for building a scientific record that has attracted the respect of the international policymaking community.

At the same time, we encouraged our scientists to talk to local Native experts – the people who had been tracking animal behavior, climate change, and other natural phenomena for years. At first, the scientists and the local experts didn't quite know what to make of each other. There was suspicion on the part of local people, and confusion on the part of scientists. But because the scientists lived in the community and took the time to get to know the hunters as people – not just as scientific informants – they gradually became accepted in the community. The same biologists kept showing up at fish camps and whale landings, and after a while the hunters realized that our biologists were serious about life in the Arctic – they weren't just passing through and taking notes – and over time a mutual respect evolved.

That's one of the most important things I can tell you about doing science in Native communities – you can't do it from a distance. You can't just blow into town, gather some data, and then blow out again. You'll never gain the trust of local people that way. You've got to remember that they've seen more researchers and public officials and consultants and industry representatives than you can shake a stick at. They've had their fill of fancy promises and rosy forecasts – to the point where any stranger getting off the plane with a briefcase looks like a carpetbagger. That's probably the biggest reason for the success of the North Slope Borough's science program – the scientists and the hunters and elders have learned to work together. That means you get science that conforms to western standards but also benefits from Native knowledge. It's the best of both worlds.

In recent years, we've seen a lot more interest from the scientific community in studying the Arctic. This is primarily because the polar region serves as an early warning system for global climate change. The federal government has funded construction of a research center in Barrow for visiting scientists. I hope these scientists will take advantage of our local expertise. There's a lot to learn from people who have witnessed at close range the changes in ice conditions, permafrost, erosion and other phenomena.

With a growing body of scientific research and a solid record of cooperation between researchers and local experts, we are positioned better than ever to make informed public policy decisions in the Arctic. As a regional government in the state of Alaska, the North Slope Borough is empowered with a great deal of local authority over land use decisions. Our municipal charter gives us a very important place at the table as individual projects are being planned. We are able to some extent to watch out for the

larger public interests – like protection of migratory routes or access to hunting grounds – that sometimes come in conflict with project plans in a region where there is so much oil and gas activity.

But whether we're talking about management of coastal areas or input on oil and gas projects, our authority is often trumped by state or federal interests. It's very discouraging when agencies ignore research that they may have helped to pay for. It's frustrating for local policymakers, just as it is for scientists.

I'm not sure what we can do to change that, but it seems like everyone could benefit from better science communication with the general public. One problem with science is that it gets recorded as data and explained in technical reports and journal articles. None of that is tailored to a general audience. I just wonder if a little science education in the popular press might not go a long way. In our region alone, there are so many stories to tell about all that has been learned through research. It's not what scientists are paid to do, but someone needs to do it if we are going to get the full value of all the important scientific work that is done.

Another strategy might be to include more general public outreach at science conferences or other events. Even a single session dedicated to telling important research stories in a more accessible style could get people more interested in what science has to offer in the realm of policy.

There are so many pressures in the policymaking process that it's easy for science to get lost or ignored. Communicating the important work of scientific research will never be easy, but if you can make a connection with people who are affected by the science, and if you can draw them in to the process – the way our scientists and our hunters came together as partners in the research effort – then your work will be noticed and appreciated at the ground level.

So, with all of that as background, I want to highlight some of our local observations and concerns regarding the dramatic warming trend we are now seeing in our northern region.

- Arctic residents are very concerned about changing sea ice conditions. We have observed firsthand ice conditions are changing and becoming less predictable. This is not new information to coastal North Slope residents. Our hunters have seen the changes, and have recognized the need to be more cautious when out on the ice and when boating. You pay attention to these things when your safety and the ability to put food on the table for your family are at stake. Subsistence hunting activities have already been affected.

- Sea ice is literally the foundation from which many important subsistence activities take place such as the spring harvest and butchering of the bowhead whale, and the harvest of bearded seal, walrus, polar bear, and other resources. It is also the foundation for the maintenance of healthy populations of marine wildlife. Decreased sea ice can affect population levels of species at all levels of the food chain.

- It also increases risk to our hunters. Sea ice is forming later in the fall, is thinner, becomes more ridged with more movement and storm activity, and thaws earlier in the spring. It provides a less stable and less safe base for spring whaling, travel, and other subsistence activities. Less stable or rougher ice increasingly blocks hunters' access to open water and key resources. With greater frequency in recent years, lives have been threatened and equipment lost when sudden fractures in the ice have left hunters stranded offshore. Open water leads are less predictable and are less effective in channeling migrating bowhead whales and other resources within the safe reach of the hunters.

- Our subsistence harvest quota for bowhead whales is derived in large part from census data obtained using visual and acoustic observations made from a sea ice study camp. Continued changes in the stability of the sea ice could alter the carefully developed and accepted methods for conducting the bowhead census. Any change in established management practices here at home is

likely to impact how the quota is determined at the international level. Especially if the warming trend that affects our ability to census bowheads is also seen as placing additional pressure on the species, perhaps through increased arctic commercial shipping, we have great fear that an IWC guided by caution might reduce our harvest quota. This would be devastating to the Inupiat culture and the health of our people.

- Violent storms are occurring earlier and later in the year than had been the case just a decade ago. They are more frequent, more intense, and last longer. Without ice acting as a buffer, and with thawing coastal permafrost, erosion of shorelines and bluffs due to fall and spring storms has increased. In all of our coastal villages, houses, roads, other buildings, boats and boat ramps, airstrips, landfills, other critical infrastructure, and archeological and cultural sites are increasingly threatened.

- The primary concern of our residents in a changing Arctic is the continuance of their traditional lifestyle. Our culture revolves around a continuing opportunity to harvest healthy wild resources for food. The Inupiat have always been an adaptable people. In some ways now, however, faced with radical and rapid changes in our very landscape, our historic ability to adapt is complicated by the relatively new permanence and comfort of our modern communities. We can never go back to being nomadic hunters living only off of the land and sea, but how can we take on Mother Nature over the long term?

- Residents are also concerned how subsistence resources will respond to the changing Arctic. Let's look at caribou. Many people believe that warming weather will make more food for the caribou but at the same time will significantly increase the presence of mosquitoes and bot flies. If this scenario is true, how will this impact the hunters' success in harvesting caribou? Some elders who thought they knew what a bad insect year was are telling us it's getting worse out there. Others believe that warming will decrease the availability of food for caribou as the tundra becomes brushier, with low plants taking over from the mosses and lichen that now dominate. Will the changing Arctic change the migration patterns, distribution, and the health of the caribou? The Nunamiut are heavily dependent on the spring and fall migrations of caribou through Anaktuvuk Pass. If the caribou don't come nearby or stop coming altogether, then this community will experience a disaster and may not survive. Residents can't simply go to the store to buy fresh meat for the year. The only meat you can buy in Anaktuvuk Pass is frozen meat (usually freezer burned) that costs three times as much as it does in urban Alaska.

- We are concerned about the long-term stability and distribution of the caribou herds, waterfowl, and fish that feed our people. The tundra is changing and changing fast. Our hunters are seeing some areas become drier. There is concern that the small temporary streams that allow fish to move between lakes during different stages of their lifecycles will vanish. Other areas are becoming grassier. Elders from Wainwright who have never seen grass around the village taller than their ankles have seen it grow thigh-high in recent years. Birds can't nest and can't see approaching foxes and other predators.

- Residents are of course concerned about expanding industrialization of our lands and waters. To lessen impacts to the environment, many exploratory and other operations take place during the winter months when travel can be accomplished via ice roads. Ice roads are being constructed in November and are being used until early May. In recent years, however, the winter freeze up has been later and the spring melt has come sooner. This is occurring at a time when drilling prospects are being explored farther and farther away from existing infrastructure, requiring longer ice roads. Additional coastal staging areas are being required. We fear that we will see in coming years a system of industrial nodes all along our coast and in Barrow.

- Here again, coastal erosion is a concern. We believe that agencies and industry are not requiring or providing sufficient coastal buffers to insulate newly constructed industrial facilities and transitions of offshore pipelines to land from the long-term effects of coastal erosion. Take the case of the JW Dalton Test Well #1 in the NPR-A north of Teshekpuk Lake. The well was first drilled in 1979 by Husky Oil. I've heard that up to a thousand feet of coastal erosion occurred in a one year period, and a breach in the reserve pit was letting drilling waste enter the Beaufort Sea. BLM was forced to undertake an emergency remediation in the spring of 2005. The effort involved 45 trailers, heavy equipment, transport sleds, and living quarters. More than 3000 cubic yards

of drilling waste was excavated and removed. Approximately 9900 gallons of diesel was removed from the well and transported off-site for disposal. More than 7 tons of cement was poured down the well casing. The total cost was $5.5 million. How many more ticking time bombs are out there? We don't want new facilities constructed along the Beaufort Sea shore that will have to be armored and defended against increasingly harsh coastal forces for decades to come, at great cost, with the noise and disruption that comes with such activity, and with possibly devastating impacts to the environment.

- We are also concerned about the integrity and safety of industrial facilities with respect to the thawing of permafrost that is accelerating. Our hunters have seen pipeline VSMs and well heads that seem to be tilting. We can only expect that these structures and larger facilities will continue to settle and face heightened stresses and engineering challenges.

- North Slope residents are increasingly concerned with an expansion of oil production into the marine environment, with the potential for noise and oil spills to adversely impact subsistence resources and harvests. Oil facilities designed to deal with existing or prior conditions may not be able to withstand more extreme conditions brought about by a changing climate. More extreme storm surges, ice movements, wave action, permafrost thawing, and other conditions may damage facilities and pipelines, and cause the release of oil into the marine environment. The noise associated with increased maintenance and repair operations may also significantly impact marine resources and subsistence harvests.

- Another concern is the potential use of increasingly ice-free arctic waters as a transportation route for oil and other hazardous substances, for the movement of other products, and for tourism. Spills could devastate the region's environment and noise from increased vessel traffic alone could significantly impact subsistence resources and the subsistence success.

- On land, residents of some villages have seen a thawing of permafrost, which has rendered traditional ice cellars unusable. A loss of the ability to store large amounts of harvested game requires more frequent hunting efforts to supply food throughout the year. Costs increase with wear and tear on equipment and with fuel prices through the roof. Risks to hunters increase. Social disruptions increase as hunters are more frequently away from jobs and families.

- I'd like to stress the importance of collecting baseline data in the Arctic wherever and as intensively as it can be done. There's long history of research on the North Slope, so there is a lot of data out there. We look to the NSSI and other entities to gather and assess the value of these data, to prioritize research, to solicit and capture local traditional and contemporary knowledge, and to responsibly utilize the information to monitor changes in the Arctic and inform future decision making. What we do not want to see is an invasion of well-intentioned researchers who do not consult with each other, duplicate efforts, fail to recognize or answer key questions, don't effectively communicate with local residents in the design of research and don't report back on their results. We have seen all of that before. I would also strongly encourage all researchers operating in our region to work with our schools. All who have worked with our kids before have found enthusiastic research partners.

Conclusions

To wrap things up, the Arctic environment is rapidly changing. I gave you several examples of how things are changing such as spring breakup being earlier and fall freeze-up much later than only 30 years ago.

The wildlife and our traditional subsistence cycle have been disrupted and we are headed into an unpredictable future.

Oil and Gas Development and Arctic Shipping are big concerns for us and have the potential to harm marine wildlife and lifestyle.

We Inupiat may be few in number but we want to protect our unique lifestyle. We're not mainstream America and our lifestyle is directly dependent on a healthy environment – both land and sea.

As I mentioned, we need good scientific research in the Arctic, but also we need to turn that research into action – and do more than just study things. We need to have practical means for protecting the Arctic and our hunting areas.

We are faced with some tough questions, and who decides what is most important? How important is our Inupiat culture and for instance polar bears to the rest of the world?

In closing, I want to thank the organizers for inviting me and allowing me to give this presentation about climate change and our unique Arctic Inupiat lifestyle. As you know, the Arctic is now ground zero for offshore oil and gas activity and climate change. The US Government's estimate is that there are 30 billion barrels of oil in our arctic waters making it the largest oilfield left in the US. It is also the place where there has been the greatest temperature change anywhere on the Planet- and we see the sea ice retreating. We need to work closely with our Congressional delegations and the Department of Interior to strengthen regulations and mitigation measures to protect our environment, marine resources, and way of life. We have nowhere else to go and live off the land and depend on the Chukchi and Beaufort Seas for our subsistence lifestyle. We Inupiat are very adaptable and have always dealt with change – but these changes are coming hard and fast and there are limits to what we can adapt to.

We don't have the inclination or resources to relocate to a big city – the bottom line is we are going to stay in the Arctic and live and die with these environmental changes.

We cherish our lifestyle. The Good Lord gave us these recourses and animals to live off and we want them here for our grandchildren.

Quyanakpuk!

Reports from Breakout Groups
Introduction and Background

The geographic regions selected for discussions were the same regions designated by the US National Climate Assessment (USGCRP) so that the observations and information from this workshop could be easily utilized by future US National Assessments. However, due to the fact that this workshop attracted primarily Native participants from only some of the US Assessment major regions in the US (and we did not have representation from some regions), the breakout groups combined attendees from a number of the regions. The following section summarizes the discussions in the Breakout Groups based upon both the oral discussions as well as the hand-written comments that many workshop participants chose to submit.

The Breakout Groups combined geographic regions into the following groups:

- Great Lakes/Northeast
- Great Plains
- Southwest/California/Great Basin
- Alaska/Pacific Northwest/Islands

Selected information from earlier US National Climate Assessment workshop reports is reprinted throughout the workshop report to provide the geographic context for the discussions and comments regarding Native issues and concerns on the impacts of climate change in these regions.

Great Lakes/Northeast
Breakout Group Reports - Comments from Participants

"With the change in climate, nations are forced to use the Earth's resource as intended – sparingly. Natives will be on the forefront of the green movement." *Unidentified participant*

"The reason we are in here is to become aware and do what our ancestors did–survive. We have to get our minds around this. Look at the past to the strength of our ancestors." *Beau Mitchell, Presenter*

Great Lakes Region
Key Characteristics
(from Native Peoples-Native Homelands Climate Change Workshop Report, 1998)

"The Woodland Tribes and Nations have occupied an area of the United States most easily understood as east of the Mississippi River for thousands of years. Due to the historical circumstances of earlier occasions of contact from the east along the Atlantic Ocean, followed by northern Euro-American settlement occurring primarily from east to west, many of the northeastern Tribal nations moved westward in advance of settlement, or were later removed to the western extreme of the Woodlands, to join the resident Indian nations of that area. Known at the time as the Old Northwest Territory, this area embraces the Mid-West (Heartlands) and the Western or Upper Great Lakes regions and includes some twelve (12) level III eco-regions. Despite subsequent settlement of the rich agricultural lands of the mid-west, a significant number of tribes have continued their Woodland cultural and ecological adaptations, particularly in the more forested regions of the Upper Great Lakes. Native peoples here have continued with a greater reliance on the remaining game (deer and rabbit), fish (inland lake, river, and Great Lake freshwater fisheries) and plants (maple sugar, paper birch, wild rice, berries, fruits, corn, beans, squash, and other medicine plants).

The resident Native nations have already survived the in-migration of the relocating Woodland tribes and subsequent Euro-American settlement. As a group, the Native peoples of the Great Lakes have weathered resettlement and the environmental transformation of their homelands, with an extreme loss of both territory and resources, in excess of the climate changes expected from global warming. However, with critically diminished homelands, Great Lakes tribes, which still depend primarily upon the resources of the natural Woodlands habitat, have a greatly reduced capacity to adjust as they have done in the past. Existing changes in agriculture, industry, pollution, and population growth in the region, which have reduced and transformed their historic woodland environment into its present state, continue and today contribute to the causes identified with global warming."

Regional Climate Change Stresses (Midwest): (from US GCRP Global Climate Change Impacts in the United States 2009 Report)

"Average temperatures in the Midwest have risen in recent decades, with the largest increases in winter. The length of the frost-free or growing season has been extended by one week, mainly due to earlier dates for the last spring frost. Heavy downpours are now twice as frequent as they were a century ago. Both summer and winter precipitation have been above average for the last three decades, the wettest period in a century. The Midwest has experienced two record-breaking floods in the past 15 years. There has also been a decrease in lake ice, including on the Great Lakes. Since the 1980s, large heat waves have become more frequent than anytime in the last century, other than the Dust Bowl years of the 1930s. The observed patterns of temperature increases and precipitation changes are projected to continue, with larger changes expected under higher emissions scenarios.

During the summer, public health and quality of life, especially in cities, will be negatively affected by increasing heat waves, reduced air quality, and increasing insect and waterborne diseases. In the winter, warming will have mixed impacts. Heat waves that are more frequent, more severe, and longer-lasting are projected. The frequency of hot days and the length of the heat-wave season will both be more than twice as great under a higher emissions scenario than a lower one (see full report for information on emission scenarios). Insects such as ticks and mosquitoes that carry disease will survive winters more easily and produce larger populations in a warmer Midwest.

Significant reductions in Great Lakes water levels, which are projected under higher emissions scenarios, lead to impacts on shipping, infrastructure, beaches, and ecosystems.

Higher temperatures will mean more evaporation and hence a likely reduction in Great Lakes water levels. Reduced lake ice increases evaporation in winter, contributing to the decline. This will affect shipping, ecosystems, recreation, infrastructure, and dredging requirements. Costs will include lost recreation and tourism dollars and increased repair and maintenance costs.

The likely increase in precipitation in winter and spring, more heavy downpours, and greater evaporation in summer would lead to more periods of both floods and water deficits. The projected pattern of increasing precipitation in winter and spring and heavy downpours is expected to lead to more frequent flooding, increasing infrastructure damage, and impacts on human health. Heavy downpours can overload drainage systems and water treatment facilities, increasing the risk of waterborne diseases. In summer, with increasing evaporation and longer periods between rainfalls, the likelihood of drought will increase and water levels in rivers and wetlands are likely to decline.

While the longer growing season provides the potential for increased crop yields, increases in heat waves, floods, droughts, insects, and weeds will present increasing challenges to managing crops, livestock, and forests.

Spring flooding is likely to delay planting. An increase in disease-causing pathogens, insect pests, and weeds cause additional challenges for agriculture. Livestock production is expected to become more costly as higher temperatures stress livestock, decreasing productivity and increasing costs associated with the needed ventilation and cooling equipment.

Native species are very likely to face increasing threats from rapidly changing climate conditions, pests, diseases, and invasive species moving in from warmer regions. All major groups of animals including birds, mammals, amphibians, reptiles, and insects will be affected by climate change impacts on local populations and by competition from species moving into the Midwest. The potential for animals to shift their ranges to keep pace with the changing climate will be inhibited by major urban areas and the presence of the Great Lakes."

Key Issues (Midwest):
(from USGCRP: 2009 Global Climate Change Impacts in the US Report

- During the summer, public health and quality of life, especially in cities, will be negatively affected by increasing heat waves, reduced air quality, and insect and waterborne diseases. In the winter, warming will have mixed impacts

- The likely increase in precipitation in winter and spring, more heavy downpours, and greater evaporation in summer would lead to more periods of both floods and water deficits

- While the longer growing season provides the potential for increased crop yields, increases in heat waves, floods, droughts, insects, and weeds will present increasing challenges to managing crops, livestock, and forests

• Native species are very likely to face increasing threats from rapidly changing climate conditions, pests, diseases, and invasive species moving in from warmer regions

Northeast Region
Key Characteristics (from 1998 report)

"The Woodland Tribes and Nations have historically occupied the eastern third of the United States. The area east of the Mississippi River consists of some twenty-nine (29) Level III Eco-Regions. For purposes of the NP-NH Climate Workshop, this large cultural area was divided into three sub-areas: The focus of this section is the Eastern Woodlands of the Northeast, including ten (10) distinct level III eco-regions; the more western Great Lakes area, embracing eleven (11) level III eco-regions, which is treated separately; and the eleven (11) level III eco-regions of the Southeastern Woodlands area which is not treated as a separate region due to the limited workshop participation from that region. The Eastern Woodlands area has a climate that may be described as humid continental with relatively short summers to the north. Vegetation in the Eastern Woodland area is primarily broadleaf with mixed coniferous forests in the northern extreme. The eastern coastal area has historically received from 40 to 80 inches of rainfall per year, with the interior receiving only about half as much.

Due to the historical circumstances of contact and Euro-American settlement, many of the Tribal nations of the northeastern, middle Atlantic, and southeastern Woodlands were wiped out or forcibly removed to the west of the Mississippi. However, a significant number of nations, particularly in the northern and southern extremes, have withstood the cultural and ecological onslaughts of the past five centuries on or near their home ground. These nations have already survived environmental transformations of their homelands, altered ecologies, and the loss of control of their traditional resources far exceeding the potential changes expected from climate change and global warming. Dramatic changes in their social and natural physical environments from diseases borne in the early sporadic coastal contacts, to the agriculture, industry, pollution and population growth have transformed their historically forested homelands into their present conditions. From the local Native perspective, human induced climate variability and change are viewed as the ongoing, logical consequence of such long-term transformative activities upon the land, water and now atmospheric resources of this continent.

The Eastern Woodlands area is heavily urban and sub-urbanized, particularly along the Atlantic coast. The inland areas, from New England through the southern Appalachian Mountains, are extensively forested. Energy, manufacturing, agriculture, and tourism are identified as the primary industries in New England and New York, with coal mining included in Appalachia. The interior Southeast provides vegetables, fruits, fish, shellfish, and wood products. Numerous industrial and commercial activities are carried on throughout this area."

Regional Climate Change Stresses (Northeast):
(From US GCRP)

"Northeast annual average temperature has increased by 2°F since 1970, with winter temperatures rising twice this much. Warming has resulted in many other climate-related changes including more frequent very hot days, a longer growing season, an increase in heavy downpours, less winter precipitation falling as snow and more as rain, reduced snowpack, earlier break-up of winter ice on lakes and rivers, earlier spring snowmelt resulting in earlier peak river flows, rising sea surface temperatures, and rising sea level. These trends are projected to continue, with more dramatic changes under higher emissions scenarios compared to lower emissions scenarios. Some of the extensive climate-related changes projected for the region could significantly alter the region's economy, landscape, character, and quality of life.

Extreme heat and declining air quality are likely to pose increasing problems for human health, especially in urban areas. By late this century under higher emissions scenarios, hot summer conditions would arrive three weeks earlier and last three weeks

longer into fall. Cities that currently experience just a few days above 100°F each summer would average 20 such days per summer. Cities like Hartford and Philadelphia would average nearly 30 days over 100°F per summer. In addition, cities that now experience air quality problems would see those problems worsen with rising temperatures, if no additional controls were placed on ozone-causing pollutants.

Agricultural production, including dairy, fruit, and maple syrup, are likely to be adversely affected as favorable climates shift. Large portions of the Northeast are likely to become unsuitable for growing popular varieties of apples, blueberries, and cranberries under higher emissions scenarios. The climate conditions suitable for maple/beech/birch forests are projected to shift dramatically northward, eventually leaving only a small portion of the Northeast with a maple sugar business and the colorful fall foliage that is part of the region's iconic character.

Severe flooding due to sea-level rise and heavy downpours is likely to occur more frequently. The densely populated coasts of the Northeast face substantial increases in the extent and frequency of storm surge, coastal flooding, erosion, property damage, and loss of wetlands. New York state alone has more than $2.3 trillion in insured coastal property. Much of this coastline is exceptionally vulnerable to sea-level rise and related impacts.

The projected reduction in snow cover will adversely affect winter recreation and the industries that rely upon it. The length of the winter snow season would be cut in half across northern New York, Vermont, New Hampshire, and Maine, and reduced to just a week or two in southern parts of the region by late this century under a higher emissions scenario. Winter snow and ice sports, which contribute $7.6 billion annually to the region's economy, will be particularly affected by warming.

The center of lobster fisheries is projected to continue its northward shift and the cod fishery on Georges Bank is likely to be diminished. Lobster catches in the southern part of the region have declined dramatically in the past decade, associated with a temperature-sensitive bacterial shell disease. Analyses also suggest that lobster survival and settlement in northern regions of the Gulf of Maine could increase under warmer conditions. Cod populations, also subject to overfishing and other stresses, are likely to be adversely affected as temperatures continue to rise."

Key Issues (Northeast): (from 2009 Global Climate Change Impacts in the US Report, PP. 108-110)

- Extreme heat and declining air quality are likely to pose increasing problems for human health, especially in urban areas.
- Agricultural production, including dairy, fruit, and maple syrup, are likely to be adversely affected as favorable climates shift.
- Severe flooding due to sea-level rise and heavy downpours is likely to occur more frequently.
- The projected reduction in snow cover will adversely affect winter recreation and the industries that rely upon it.
- The center of lobster fisheries is projected to continue its northward shift and the cod fishery on Georges Bank is likely to be diminished.

The Great Lakes/Northeast Cultural Area
Breakout Group Report – Comments from Participants

CURRENT STRESSES: What are the current stresses affecting the social systems, natural resources and economic sectors in your Cultural Area?

- Poverty, especially rural poverty
- Ill-informed, under-informed education in school system
- Energy security
- Food security
- Animals getting sick
- Invasive species: Emerald ash borer, Pine weevil, Oak wilt, Gypsy moth
- Continued expansion; lack of smart growth
- Encroachment of mineral companies
- Overdevelopment, population growth
- Some housing is dilapidated
- Highly fragmented communities on scarce land base –
- Long commutes between villages
- Poor food quality, contributing to diabetes
- Respiratory disease (asthma, chronic obstructive pulmonary disease)
- Mental health (stress because of poverty, limited resources, etc.)
- Pollution – toxic waste contamination
- Ineffective government
- Misappropriation of funds
- Internal oppression
- Lack of passion, lack of organization, lack of resources and leadership – lack of information that is understood by local people
- Lack of concern for well-being of people
- High unemployment; seasonal jobs
- Lack of education/awareness about climate change
- Lack of a sustainable food source
- Loss of native species
- Increased number of insects
- Threats to existence of sacred plants, making it difficult to practice customs
- Buildings encroaching on Native habitats
- Contaminated and diminishing natural resources
- Overcrowding: demand exceeds inventory; there is not enough housing for growing population
- Some housing has mold problems; e.g., old Air Force Base homes
- Water quality; mercury in water
- Cardiovascular disease (stroke, heart attacks)
- Diabetes
- Chemical dependency
- Ozone air quality alerts spreading
- Dependency on government funding
- Culture loss
- Spiritual disconnection
- Pressure on reservations to allow mining and oil and gas activities, especially for tar sands, or to accommodate oil pipelines
- Selling out to big oil

CLIMATE IMPACT: Consider how weather extremes, climate change and variability might either amplify or dampen these stresses, or create new ones?

- The oil pipelines in our regions are destroying habitats, making the environment less sustainable for agriculture and limiting sites and resources
- Food resources (deer, beaver) migrating out due to warming
- There is increased competition between native and non-native species
- Weather changes are happening and impacting operations – getting to work, construction, roads
- Polluted resources may create health problems
- Climate change will increase community building and community bonds
- No-flow streams impacting spawning habitats for subsistence fishing and hunting and gathering used by majority of communities to feed their families
- There are more insects.
- Increasing cost of resources will diminish funds available for housing
- There is greater competition from non-tribal neighbors for "greenspace" and water access
- Climate change is likely to exacerbate health issues (cardiovascular disease, respiratory disease, and stress)

ACTION STRATEGIES: What coping or action strategies might address the additional stresses created by extreme weather events, climate variability and climate change, as well as helping to address existing non-climate stresses?

- Education and training to increase jobs and opportunities
- Change focus from capitalist education to humanities. Debunk the American Dream myth
- Wind power
- Improved energy efficiency
- Investment by governing bodies in energy-efficient housing and in energy sources
- Utilization of local resources
- Native/local harvest
- Growing organic food
- Protecting watersheds as a whole, holistically accounting and protecting water, air and land, protecting life of all two- and four-leggeds, swimmers, winged ones, creepers, and spiritual ones
- Expanding operations using green methods Food source, using old retention beds for native wild rice beds
- Protecting our water with ordinances; banning boats
- Don't pollute
- Utilize local resources, e.g., water, energy, labor, food production
- Energy-efficient homes with natural light, heat, ventilation, and cooling
- Plant more trees as a carbon catchment
- Build houses to be sustainable, using the practice of permaculture
- Apply indigenous knowledge
- Design a curriculum for our future generations that emphasizes our connection with Mother Earth
- Solar power
- Low-impact hydroelectric power
- Renewable housing materials
- Lower speed limits
- Food security
- Growing our own food
- Renewed emphasis on sustainable agriculture
- Upgrading fisheries to recycle the tanks' water rather than continuously pumping water from ground resource
- Maintaining sustainable forests and resources
- Utilizing local resources
- Recycle
- Create and maintain migration corridors for our non-human relatives
- Efficient prairie solar housing
- Build houses to be spiritual, simple, and stout
- Revitalize the knowledge of wigwams and using new home designs: earthships, treehouses, straw-bale homes

INFORMATIONAL NEEDS: What new or additional information would allow people to better understand the linkage between the current stresses and weather extremes, climate variability and change?

- Teaching tools for best models/practices
- Grants/funding for green jobs and job training
- Better education and awareness for decision makers at tribal and federal levels
- More awareness. We must educate our most impoverished and vulnerable
- Renewable energy/efficiency
- Safer water
- Community volunteers, green methods, and clean air
- Encouraging Native traditions
- Assistance in developing plans
- Education, awareness, and action, especially at the community level
- Cooperating with school boards and educating them about adopting a sustainable curriculum
- Passing knowledge about the environment, climate, and solutions on to future generations
- More efficiency in building; utilization of thermal and solar techniques
- Better living without fear of damaging our bodies
- Protection of sacred sites, including all that is natural
- Community involvement

Great Plains Region
Breakout Group Reports - Comments from Participants

"Listen to Mother Earth and apply to our lives what She is telling you."
Unidentified participant

Key Characteristics: (from Native Peoples-Native Homelands Climate Change Workshop Report, 1998)

"The northern, central, and southern Great Plains of the United States is largely a prairie grassland ecosystem, an area of approximately 400 million acres, stretching at its northern end from the Canadian province of Saskatchewan to northern Mexico in the south and from the Rocky Mountains in the west to the woodlands of Wisconsin in the east. The Great Plains includes portions of Montana, Wyoming, North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, New Mexico, and Texas, occupying the central third of the U.S. continental land mass. The Culture Area is drained and nourished with rivers, streams, and creeks that make up lush riparian areas and fish and wildlife habitat.

It is a former seabed that drained at the time when the Rocky Mountains surfaced. Deeper topsoil is found in the eastern portions due to glaciations from the last Ice Age, which extended into the central areas. The prairie consists of three distinct types of native grasses, the short grass in the west, the mid-grass, and the tall-grass in the east. The temperate areas within the Great Plains are further defined by the amounts of moisture that precipitate eastward traveling storms. The Great Plains are characterized by extremes of climate. The land areas within the larger Culture Area are also well defined by traditional hunting grounds and agrarian areas near water of the Tribal Nations that occupied the lands and were later recognized by treaties with the U.S. government. The Native people existed in a close symbiotic and spiritual relationship with the buffalo that also lived in the Great Plains and maintained the balance of creation. In addition to national parks and monuments, the majority of the remaining contiguous native grasslands are home to the Native people on the islands established by the government and called reservations.

Characteristics of the region include major human transformation of land by extensive and mechanized agriculture, increasing population shifts from rural to urban areas, thriving trade activities, and an increase of high-tech farm enterprises. The major land uses are agriculture and livestock; these are restricted by variability in temperature and precipitation. Over 90% is in farms and ranches and 75% is cultivated. The five major production systems are range livestock, crop fallow, groundwater irrigation (aquifer dependent), river valley (snow-melt dependent) and confined livestock feeding. In addition, water availability is becoming limited because of over subscription due to multiple demands for drinking water, agriculture, and wildlife conservation."

Regional Climate Change Stresses:
(from: US GCRP Global Climate Change Impacts in the United States 2009 Report))

"Over the last few decades, average temperatures have risen throughout the Great Plains, with the largest increases occurring in the winter months and over the northern states. Relatively cold days are becoming less frequent and relatively hot days more frequent.

In the future, temperatures are projected to continue to increase with larger changes under scenarios of higher heat-trapping emissions as compared to lower. Summer increases are projected to be larger than those in winter in the southern and central Great Plains. Precipitation is also expected to change, particularly in winter and spring. Conditions are expected to become wetter in the north and drier in the south. Projected changes include more frequent extreme events such as heat waves, droughts, and heavy rainfall. Projected increases in temperature, evaporation, and drought frequency add to concerns about the region's declining

water resources. Most of the region's water comes from the High Plains aquifer (also referred to by the name of its largest formation, the Ogallala aquifer) from which water withdrawals already outpace recharge. Rising temperatures, faster evaporation rates, and more sustained drought brought on by climate change will add more stress to overtaxed water resources. Agriculture, ranching, and natural lands, already under pressure due to an increasingly limited water supply, are very likely to also be stressed by rising temperatures. Agriculture covers 70 percent of the Great Plains. As temperatures continue to rise, the optimal zones for growing certain crops will shift. Pests will spread northward and milder winters and earlier springs will encourage greater numbers and earlier emergence of insects. Projected increases in precipitation are unlikely to be sufficient to offset decreasing soil moisture and water availability due to rising temperatures and aquifer depletion.

Climate change is likely to affect native plant and animal species by altering key habitats such as the wetland ecosystems known as prairie potholes or playa lakes. Climate change is likely to combine with other human-induced stresses to further increase the vulnerability of ecosystems to pests, invasive species, and loss of native species. Breeding patterns, water and food supply, and habitat availability will all be affected by climate change. Grassland and plains birds, already stressed by habitat fragmentation, could experience significant shifts and reductions in their ranges.

Ongoing shifts in the region's population from rural areas to urban centers will interact with a changing climate, resulting in a variety of consequences. As young adults move out of small, rural communities, the towns are increasingly populated by a vulnerable demographic of the very old and the very young, placing them more at risk for health issues that are projected to increase with climate change. The region is also home to 65 Native American tribes; the people on tribal lands have limited capacities to respond to climate change. Many reservations already face severe problems with water quality and quantity and these problems are likely to be exacerbated by climate change."

Key Issues:
(from: USGCRP Global Climate Change Impacts in the United States 2009 Report)

- Projected increases in temperature, evaporation, and drought frequency add to concerns about the region's declining water resources

- Agriculture, ranching, and natural lands, already under pressure due to an increasingly limited water supply, are very likely to also be stressed by rising temperatures

- Climate change is likely to affect native plant and animal species by altering key habitats such as the wetland ecosystems known as prairie potholes or playa lakes

- Ongoing shifts in the region's population from rural areas to urban centers will interact with a changing climate, resulting in a variety of consequences

Breakout Group Reports - Comments from Participants

CURRENT STRESSES: What are the current stresses affecting the social systems, natural resources and economic sectors in your Cultural Area?

- Socioeconomic ills are common on the reservation
- People are unaware of climate change and its impacts
- A lot of reservation land is closely interwoven with privately owned land
- Houses are moldy and not weatherized
- Water Quality: Pollution is common
- Human/environmental disease vectors
- Mental health issues are also increasing due to poverty and hopelessness
- Apathy: there are growing feelings of hopelessness
- Jobs are needed
- There is a disconnect between tribal colleges and tribal members
- There are not enough houses for tribal members
- Roads are difficult to maintain; funding for them is lacking
- Water Quantity: The Ogallala Aquifer is being drawn down
- Cardiovascular and respiratory diseases
- Tribal government is not proactive in matters of the environment
- The Tribal voice is not heard or respected in the science community

ACTION STRATEGIES: What coping or action strategies might address the additional stresses created by extreme weather events, climate variability and climate change, as well as helping to address existing non-climate stresses?

- Create jobs, especially green ones
- Develop climate change programs at Tribal Colleges
- Publish scientific results regarding climate change impacts on Native Peoples and our lands in peer-reviewed journals to gain respect and credibility in the science community
- Raise community awareness; train tribal members to go green
- Provide sustained local training in developing and maintaining renewable energy
- Explore bio-fuels as an economic and mitigation strategy
- Support local producers, farmers' markets, and community gardens
- Establish tribal seed banks
- Practice restoration ecology
- Build more homes
- Examine alternative forms of housing, like straw bale and earth homes
- Develop public transit between communities on reservations
- Use the Ogallala Aquifer for drinking water only
- Work with the Indian Health Service on the impacts of climate change
- Muster the political will to address adaptations
- Talk to our congressional delegations about climate change legislation. Visit them often and bring friends and relatives
- Select adaptation and mitigation measures that are practical
- Establish local climate adaptation and mitigation resource centers where community members can get information and assistance
- Establish agreements among Tribal government, tribal colleges and universities, and Tribal communities
- Develop local resource center for adaptation strategies
- Develop a strategy for monitoring drought: drought mitigation and adaptation plans
- Apply for American Reinvestment and Recovery Act of 2009 and other sources of federal funds
- Strengthen tribal codes of ethics, so people can be activist and not fear for their jobs
- Let tribal spirituality play a role in adaptation
- Teach climate change throughout the school years, from pre-school through college
- Fully fund and support Tribal Colleges and Universities as the education and workforce development vehicle
- Communicate with all sectors of the tribes - community members and councils
- Develop tribal energy producers – wind, solar, and geothermal – and control them tribally
- Green up tribal communities
- Develop community gardens
- Grow your own food
- Adjust agricultural practices to match changed climate conditions
- Reduce pesticide use
- Apply for recovery funds for weatherization and retrofitting old housing
- Create community education forums on how to save energy at home by choosing the right light bulbs, putting plastic over windows, and turning off lights
- Establish and enforce more stringent tribal and federal water use policies
- As water becomes scarce, increase understanding of tribal treaty rights to protect water resources
- Eat better food - see "Food and Agriculture"
- Be more proactive in environmental protection
- Adopt Tribal and federal policies to minimize our carbon footprint and mitigate climate impacts
- Organize holistically; include tribal spirituality in mitigation and adaptation standards
- Keep honest, open dialogue with all stakeholders, respecting each stakeholder's values
- Work with the Southern Climate Impacts Planning Program (SCIPP) in its effort to develop adaptation strategies for region. Communicate these resources and make them available locally
- Develop emergency management plans to address emergencies such as tornadoes, earthquakes, flooding, and drought adapt to climate change and mitigate its impacts
- Establish policies and enforcement protocols for sacred sites
- Participate in sustainable carbon sequestration strategies
- Utilize our Native knowledge and intellect to work more harmoniously with the environment. Listen to Mother Earth and apply to our lives what She is telling you
- Protect sacred sites

INFORMATIONAL NEEDS: What new or additional information would allow people to better understand the linkage between the current stresses and weather extremes, climate variability and change?

• Food production depends on increasingly scarce water • Mining on Dine and Hopi lands creates pollution • Water is scarce and population growth is making it scarcer • The fence between Arizona and Mexico cuts through the Tohono O'Odham Nation	• Salmon people depend on fisheries and subsistence fishing. When water is too hot, fish are not there • Health consequences from water pollution and radiation resulting from mining • Flow in the Colorado River is decreasing

Southwest/California/Great Basin Breakout Group Reports - Comments from Participants

"Create a vision of a sustainable community." *Unidentified conference participant*

"Water is life. Treat it reverently." *Unidentified conference participant*

Key Characteristics: (from: 1998 Native Peoples Native Homelands Climate Change Workshop Report)

"This region includes Arizona, New Mexico, and parts of California, Colorado, Nevada, and Utah, and includes the climate workshop regions of the Southwest and Southwest Border areas. This area includes eight (8) distinct Level III eco-regions. The arid nature of much of the West combined with rapid population growth and increasing demand for water resources, means that this area is vulnerable to climate change and climate variability. The economy is a mix of ranching, dryland and irrigated agriculture, mining, tourism, retail, manufacturing, and high technology industries."

"Much of the region is sparsely populated, with perhaps a dozen major, and very rapidly growing, high-density urban centers. These urban and economic systems are based on a rich mix of ecosystems including alpine mountains, deserts, and many fertile valleys riparian ecosystems, all of which will potentially be affected by climate variability and change."

(From: USGCRP Global Climate Change Impacts in the United States 2009 Report)

"The Southwest region stretches from the southern Rocky Mountains to the Pacific Coast. Elevations range from the lowest in the country to among the highest, with climates ranging from the driest to some of the wettest. Past climate records based on changes in Colorado River flows indicate that drought is a frequent feature of the Southwest, with some of the longest documented "megadroughts" on Earth. Since the 1940s, the region has experienced its most rapid population and urban growth. During this time, there were both unusually wet periods (including much of 1980s and 1990s) and dry periods (including much of 1950s and 1960s).2 The prospect of future droughts becoming more severe as a result of global warming is a significant concern, especially because the Southwest continues to lead the nation in population growth.

"Droughts are a long-standing feature of the Southwest's climate. The droughts of the last 110 years pale in comparison to some of the decades-long "megadroughts" that the region has experienced over the last 2000 years.13 During the closing decades of the 1500s, for example, major droughts gripped parts of the Southwest.14 These droughts sharply reduced the flow of the Colorado River12,15 and the all-important Sierra Nevada headwaters for California,16 and dried out the region as a whole. As of 2009, much of the Southwest remains in a drought that began around 1999. This event is the most severe western drought of the last 110 years, and is being exacerbated by record warming.17

"Water is already a subject of contention in the Southwest, and climate change – coupled with rapid population growth – promises to increase the likelihood of water-related conflict. Projected temperature increases, combined with river-flow reductions, will increase the risk of water conflicts between sectors, states, and even nations. In recent years, negotiations regarding existing water supplies have taken place among the seven states sharing the Colorado River and the two states (New Mexico and Texas) sharing the Rio Grande. Mexico and the United States already disagree on meeting their treaty allocations of Rio Grande and Colorado River water.

"In addition, many water settlements between the U.S. Government and Native American tribes have yet to be fully worked out. The Southwest is home to dozens of Native communities whose status as sovereign nations means they hold rights to the water for use on their land. However, the amount of water actually available to each nation is determined through negotiations and

litigation. Increasing water demand in the Southwest is driving current negotiations and litigation of tribal water rights. While several nations have legally settled their water rights, many other tribal negotiations are either currently underway or pending. Competing demands from treaty rights, rapid development, and changes in agriculture in the region, exacerbated by years of drought and climate change, have the potential to spark significant conflict over an already over-allocated and dwindling resource.

Regional Climate Change Stresses: (from: USGCRP Global Climate Change Impacts in the United States 2009 Report)

"Recent warming in the Southwest has been among the most rapid in the nation. This is driving declines in spring snowpack and Colorado River flow. Projections of future climate change indicate continued strong warming in the region, with much larger increases under higher emissions scenarios compared to lower. Projected summertime temperature increases are greater than the annual average increases in parts of the region and are likely to be exacerbated by expanding urban heat island effects. Further water cycle changes are projected, which combined with increasing temperatures signal a serious water supply challenge in the decades and centuries ahead. The prospect of future droughts becoming more severe due to warming is a significant concern, especially because the Southwest continues to lead the nation in population growth.

Water is vital to agriculture, hydroelectric power production, the growing human population, and ecosystems. Water supplies in some areas are already becoming limited. Large reductions in spring precipitation are projected for the Southwest. Continued temperature increases combined with river flow reductions and rapid population growth will increase competition for water supplies.

Impacts of climate change on the landscape of the Southwest are likely to be substantial, threatening biological diversity, protected areas, and ranching and agricultural lands. Temperature increases have made the current drought in the region more severe than the natural droughts of the last several centuries. Record-setting wildfires are resulting from the rising temperatures and related reductions in spring snowpack and soil moisture.

Rapid landscape transformation due to vegetation die-off, wildfire, and loss of wetlands along rivers reduces flood-buffering capacity. Decreased snow cover on the lower slopes of high mountains and the increased fraction of winter precipitation falling as rain and therefore running off more rapidly also increases flood risk.

Rising temperatures will adversely affect winter activities such as downhill and cross-country skiing, snowshoeing, and snowmobiling. Later snow and less snow coverage are projected for ski resort areas, particularly those in the southern part of the region. Decreases from 40 to almost 90 percent are likely in end-of-season snowpack under high emissions scenarios in counties with major ski resorts from New Mexico to California.

With more intense, longer-lasting heat waves projected to occur over this century, demands for air conditioning are expected to deplete electricity supplies, increasing risks of brownouts and blackouts. Much of the region's agriculture will experience detrimental impacts in a warmer future, particularly specialty crops in California such as apricots, almonds, artichokes, figs, kiwis, olives, and walnuts. These and other such crops require a minimum number of hours below a chilling temperature threshold in the winter to set fruit for the following year."

Key Issues: (From USGCRP Global Climate Change Impacts in the United States 2009 Report)

- Water supplies will become increasingly scarce, calling for trade-offs among competing uses, and potentially leading to conflict
- Increasing temperature, drought, wildfire, and invasive species will accelerate transformation of the landscape
- Increased frequency and altered timing of flooding will increase risks to people, ecosystems, and infrastructure
- Unique tourism and recreation opportunities are likely to suffer
- Cities and agriculture face increasing risks from a changing climate

Comments from Participants

CURRENT STRESSES: What are the current stresses affecting the social systems, natural resources and economic sectors in your Cultural Area?

- Food production depends on increasingly scarce water
- Mining on Dine and Hopi lands creates pollution
- Water is scarce and population growth is making it scarcer
- The fence between Arizona and Mexico cuts through the Tohono O'Odham Nation
- Salmon people depend on fisheries and subsistence fishing. When water is too hot, fish are not there
- Health consequences from water pollution and radiation resulting from mining
- Flow in the Colorado River is decreasing

CLIMATE IMPACT: Consider how weather extremes, climate change and variability might either amplify or dampen these stresses, or create new ones?

- With climate change, the Sonoran Desert, home to a variety of unique plants and animals, is becoming even hotter and dryer
- Warming means drying, making water even scarcer
- With less snow and more rain, chemicals are more likely to percolate into the ground, potentially contaminating lakes, rivers, streams, and aquifers
- Droughts leave trees less able to fight infestation

ACTION STRATEGIES: What coping or action strategies might address the additional stresses created by extreme weather events, climate variability and climate change, as well as helping to address existing non-climate stresses?

- Taxing companies for the use of tribal land
- Education in a setting in which the knowledge of elders – knowledge about the different plants and what environments will make seeds thrive – is valued and made part of the curriculum. Blend Native perspectives with science
- Work on the Navajo Nation with Chapter Houses to educate the young
- Create less energy waste. Outreach programs on energy consumption
- Regulate discharges from coal power plants, e.g. mandating "air scrubbers" that can cut the amount of pollutants that reach our air
- Buy local
- Have foods labeled with a nutritional index.
- Adopt tribally sustainable building codes
- Harvest rainwater, as families in Tucson do
- Natives knowing their allies, Native and non-Native
- A multi-cultural alliance for a safe environment
- Review laws that affect indigenous people; change what is detrimental
- Native perspective: this is Mother Earth. You do not dig or remove what is inside Mother Earth
- More climate change classes, like the one at Tohono O'Odham Community College, at tribal colleges and universities, as well as classes in renewable energy and environmental science
- Blending of science and Native knowledge, as is done at Dine College
- Acknowledge that even Natives are part of the problem
- Increase renewable energy – there are alternatives to coal
- Develop sustainable communities
- Pay attention to ingredients in food
- Use gardening techniques to conserve water like those used 400 years ago – e.g.: terracing, stone grids to cool water, crop rotation, planting alfalfa, not tilling land, permaculture, drip irrigation, grow plants that are compatible with the environment.
- Create living buildings in symbiosis with the natural environment
- Use energy-efficient building design: LEED (green building accreditation, Leadership in Energy and Environmental Design) buildings
- Make water a free resource for all – do not bottle it
- Natives knowing what is happening in government, both federal and tribal
- Knowledge of climate change
- Effect on spiritual heritage
- Protect sacred sites

INFORMATIONAL NEEDS: What new or additional information would allow people to better understand the linkage between the current stresses and weather extremes, climate variability and change?

- More Native American scientists with traditional knowledge and the trust of communities should work for the indigenous community
- Native Americans should help each other stay informed about happenings in government, both federal and Tribal
- Tribes should know their allies, both Native and non-Native
- Natives should communicate issues to the non-Native community to capture their votes, communicating climate change knowledge to everyone from the Native perspective
- Communities should embrace renewable energy, step up to the plate and admit that we too are part of the problem and help to correct it

Additional Points from Breakout Group Discussions

There is a huge migration of people from the east to the west, bringing with it demand for electricity and water. At the same time, climate in the West is warming. There is less snow and less rain. Seasonal stream flow in the Colorado Basin is occurring earlier. Drought is increasing and the river is getting warmer. In the Southwest, water is critical. The increase in population has increased the demand for water from the Colorado River. Food and habitat depend on the availability of water. In the Lake Tahoe-Reno region, there is competition for water resources. Water is increasingly saline.

In Northern California, the coast is hot and the salmon population is impacted; because the indigenous people are salmon people, impact on salmon translates into impact on their daily lives. The world is out of balance: fires are larger and more frequent, air quality is bad, and the smoke after a fire creates health problems, especially asthma; more animals are deformed. Because of chemicals used, cancer rates and mortality rates are high. Global warming is impacting the people's spiritual well-being as well: Connectivity with nature and the species is affected.

In an indigenous community in Arizona, the fruits that can be grown are not the same; changes are occurring in traditional huts and in special wine for the rain ceremony. Some traditional animals have not visited for four years. Rain is coming from a different direction than in the past. The changing climate is inconsistent with the traditional calendar.

Because of mining, future generations in the Grand Canyon area are at risk of exposure to contaminated water. In Southern Arizona the St. Peter River is going dry and beavers are in danger of extinction.

Near the border with Mexico, security searches and the security fence are an environmental hazard. Animals are not able to migrate across the border. Women are not able to work on their baskets, because the materials they need cannot be found on this side of the border.

The water on some Hopi lands has been polluted by coal mining. Some streams are dry and plants are dying. Sacred mountains are being massacred by uranium mining.

On Navajo lands, water quality is not being safeguarded as it should be. Farmers depend on precipitation.

Drying is expected over the Sonoran Desert, the hottest part of North America—100 degrees in the summer, 60 degrees in the winter. The creation stories of the Saguaran people depend on climate. The Sonoran Desert, the most diverse in the world, contains a variety of unique plants and animals, such as the saguaro cactus. The saguaro cactus is an important source of food and shelter for many indigenous people in the Sonoran Desert; many still gather saguaro fruits as their ancestors have for hundreds of years so the depend on climate.

Alaska/Pacific Northwest/Islands Breakout Group Reports - Comments from Participants

"Violent storms are occurring earlier and later in the year than had been the case just a decade ago. They are more frequent, more intense, and last longer. Without ice acting as a buffer, and with thawing coastal permafrost, erosion of shorelines and bluffs due to fall and spring storms has increased. In all of our coastal villages, houses, roads, other buildings, boats and boat ramps, airstrips, landfills, other critical infrastructure, and archeological and cultural sites are increasingly threatened."

"The primary concern of our residents in a changing Arctic is the continuance of their traditional lifestyle. Our culture revolves around a continuing opportunity to harvest healthy wild resources for food." *Captain Eugene Brower*

Alaska

Key Characteristics (from the National Network of Libraries of Medicine: ***http://nnlm.gov/pnr/characteristics/alaska.html)***

"Alaska is the largest state in the United States encompassing 656,425 square miles. It is one fifth the size of the entire lower 48 states, and larger than the next three largest states combined. Alaska holds the record for the coldest temperature in the US: -80F on January 23, 1971 in Prospect Creek, and for the highest point, Mt McKinley, at 20,300 feet above sea level. Alaska is organized into 16 boroughs instead of counties. Remote areas not included in the boroughs are divided into census areas. The capital of Alaska is Juneau. Despite its grand geographical presence, Alaska ranks 48th in population with approximately 670,000 people according to the 2006 U.S. Bureau of the Census Population Estimates Program. While over 40% of the residents live in the largest city of Anchorage, most of the rest of the state is sparsely populated or uninhabited with communities separated by vast distances. 52.3% of the state population lives in frontier areas. Residents are 67% white, 16% Alaska Native and American Indian, 4.6% Asian, and 3.7% African American with 4.7% of the population reporting more than one ethnicity. The Alaska Native population represents eleven distinct cultures who speak twenty different languages." ***(from: http://www.alaskascenes.com/alaskamap.html)***

Regional Climate Change Stresses:
(From: US GCRP 2009 Global Climate Change Impacts in the US Report)

"Over the past 50 years, Alaska has warmed at more than twice the rate of the rest of the United States. Its annual average temperature has increased 3.4°F, while winters have warmed by 6.3°F. The higher temperatures are already causing earlier spring snowmelt, reduced sea ice, widespread glacier retreat, and permafrost warming. The observed changes are consistent with climate model projections of greater warming over Alaska, especially in winter, as compared to the rest of the country. Climate models also project increases in precipitation over Alaska. Simultaneous increases in evaporation due to higher air temperatures, however, are expected to lead to drier conditions overall, with reduced soil moisture. Average annual temperatures are projected to rise between 5 and 13°F by late this century, with lower emissions scenarios yielding increases at the lower end of this range and higher emissions yielding increases near the high end of the range. Between 1970 and 2000, the snow-free season increased by about 10 days across Alaska, primarily due to earlier snowmelt in the spring. A longer growing season has potential benefits, such as a longer season for summer tourism and agriculture. However, the white spruce forests in Alaska's interior are experiencing declining growth due to drought stress and continued warming could lead to widespread death of trees. The decreased soil moisture also suggests that agriculture might not benefit from the longer growing season.

During the 1990s, south-central Alaska experienced the largest outbreak of spruce beetles in the world as rising temperatures allowed the beetle to survive the winter and to complete its life cycle in half the usual time. Drought-stressed trees were unable to fight off the infestation. Fires are also increasing. By the end of this century, the area burned in Alaska is projected to triple under a moderate greenhouse gas emissions scenario and to quadruple under a higher emissions scenario. Across the southern two-thirds of Alaska, the area of closed-basin lakes (lakes without stream inputs or outputs) has decreased over the past 50 years. This is likely due to the greater evaporation and thawing of permafrost that result from warming. These wetlands provide breeding habitat for millions of waterfowl and shorebirds and are important hunting and fishing grounds for Native People. A continued decline in the area of surface water would present challenges for ecosystems, natural resources, and the people who depend upon them.

As permafrost thaws, the land can sink and collapse, damaging forests, homes, and infrastructure. Economists estimate that thawing permafrost will add billions of dollars in repair costs to public infrastructure (costs to private property have not yet been estimated). Alaska has more coastline than the other 49 states combined. These coastlines are increasingly threatened by a combination of losing their protective sea ice buffer, increasing storm activity, and thawing coastal permafrost. The ground beneath some communities is literally crumbling into the sea. The rate of erosion along Alaska's northeastern coastline has doubled over the past 50 years. Climate change is altering marine ecosystems in ways that affect commercial fisheries. The world's largest single fishery is the Bering Sea pollock fishery, which has undergone major declines in recent years. Air and sea temperatures have increased, and sea ice has declined in this region."

Key Issues: (from USGCRP 2009 U.S. Global Climate Change Impacts in the United States)

- Longer summers and higher temperatures are causing drier conditions, even in the absence of strong trends in precipitation
- Insect outbreaks and wildfires are increasing with warming
- Lakes are declining in area
- Thawing permafrost damages roads, runways, water and sewer systems, and other infrastructure
- Coastal storms increase risks to villages and fishing fleets
- Displacement of marine species will affect key fisheries

Pacific Northwest

Key Characteristics: (from Impacts of Climate Variability and change in the Pacific Northwest (1999), *http://www.usgcrp.gov/usgcrp/Library/nationalassessment/pnw.pdf)*

"The Pacific Northwest (PNW) region is defined as the states of Idaho, Oregon, and Washington, and for some purposes we also consider the adjoining areas of the Columbia River Basin. The PNW has an exceptional diversity of natural resources and ecosystems, including coastal salt marshes and lowland freshwater wetlands, sandy beaches and rocky headlands, upland forest, and high mountain alpine environments. The interior landscape of the PNW includes wheatlands and sagebrush desert in the eastern parts of Oregon and Washington; and the Rocky Mountains, high desert, and lava fields of Idaho. The natural environment of the region provides a large variety of outdoor recreation opportunities such as hiking, bicycling, boating, fishing, hunting, and skiing. The natural vegetation of the region can be characterized by three main vegetation types [74]: forest, shrub-steppe, and alpine, but climatic variation across the PNW gives rise to many different plant communities and landscape patterns within these main vegetation types. Forests, for example, range from those that thrive in damp climates, like coastal Sitka spruce, to those that thrive in dry climates, like ponderosa pine and juniper. The degree of geographic and ecosystem complexity found in the PNW is unusual in the United States. The Cascade mountain range divides the region geographically and climatically, and this divide plays a huge role in the water resources, salmon, and forests of the PNW.

Regional Climate Change Stresses: (From US GCRP 2009 Global Climate Change Impacts in the US Report)

Annual average temperature over the Northwest region as a whole rose about 1.5°F over the past century, with some areas experiencing increases up to 4°F. The region's average temperature is projected to rise another 3 to 10°F in this century, with higher emissions scenarios resulting in warming in the upper end of this range. Increases in winter precipitation and decreases in summer precipitation are projected by many climate models, though these projections are less certain than those for temperature. Impacts related to changes in snowpack, streamflows, sea level, forests, and other important aspects of life in the Northwest are already underway, with more severe impacts expected over the coming decades in response to continued and more rapid warming.

The Northwest is highly dependent on temperature-sensitive springtime snowpack to meet growing and often competing water demands such as municipal and industrial uses, agricultural irrigation, hydropower production, navigation, recreation, and in-stream flows that protect aquatic ecosystems including threatened and endangered species. Higher temperatures are causing more winter precipitation to fall as rain rather than snow and are contributing to earlier snowmelt. Further declines in snowpack are projected, reducing the amount of water available during the warm season.

Higher summer temperatures and earlier spring snowmelt are expected to increase the risk of forest fires by increasing summer moisture deficits; this pattern has already been observed in recent decades. Drought stress and higher temperatures will decrease tree growth in most low- and mid-elevation forests and will also increase the frequency and intensity of mountain pine beetle and other insect attacks, further increasing fire risk and reducing timber production, an important part of the regional economy.

Northwest salmon populations are already at historically low levels due to variety of human-induced stresses. Climate change affects salmon throughout their life stages and poses an additional stress. Studies suggest that about a third of the current habitat for the Northwest's salmon and other coldwater fish will no longer be suitable for them by the end of this century due to climate change.

Key Issues: (from USGCRP 2009 U.S. Global Climate Change Impacts in the United States)

- Declining springtime snowpack leads to reduced summer streamflows, straining water supplies
- Increased insect outbreaks, wildfires, and changing species composition in forests will pose challenges for ecosystems and the forest products industry
- Salmon and other coldwater species will experience additional stresses as a result of rising water temperatures and declining summer streamflows
- Sea-level rise along vulnerable coastlines will result in increased erosion and the loss of land

The Islands

Key Characteristics: (From USGCRP 2009 Global Climate Change Impacts in the US Report)

"The U.S. affiliated Pacific Islands are home to approximately 1.7 million people in the Hawaiian Islands; Palau; the Samoan Islands of Tutuila, Manua, Rose, and Swains; and islands in the Micronesian archipelago, the Carolinas, Marshalls, and Marianas.[530] These include volcanic, continental, and limestone islands, atolls, and islands of mixed geologies.[530] The degree to which climate change and variability will affect each of the roughly 30,000 islands in the Pacific depends upon a variety of factors, including the island's geology, area, height above sea level, extent of reef formation, and the size of its freshwater aquifer.[531] In addition to Puerto Rico and the U.S. Virgin Islands, there are 40 island nations in the Caribbean that are home to approximately 38 million people.[532] Population growth, often concentrated in coastal areas, escalates the vulnerability of both Pacific and Caribbean island communities to the effects of climate change, as do weakened traditional support systems. Tourism and fisheries, both of which are climate-sensitive, play a large

economic role in these communities.[530] Small islands are considered among the most vulnerable to climate change because extreme events have major impacts on them. Changes in weather patterns and the frequency and intensity of extreme events, sea-level rise, coastal erosion, coral reef bleaching, ocean acidification, and contamination of freshwater resources by salt water are among the impacts small islands face.[533] "

Regional Climate Change Stresses: (From: US GCRP 2009 Global Climate Change Impacts in the US Report)

Climate change presents U.S.-affiliated islands with unique challenges. Small islands are vulnerable to sea-level rise, coastal erosion, extreme weather events, coral reef bleaching, ocean acidification, and contamination of freshwater resources with saltwater. The islands have experienced rising temperatures and sea level in recent decades. Projections for the rest of this century suggest continued increases in air and ocean surface temperatures in both the Pacific and Caribbean, an overall decrease in rainfall in the Caribbean, an increased frequency of heavy downpours nearly everywhere, and increased rainfall during the summer months (rather than the normal rainy season in the winter months) for the Pacific islands. Hurricane wind speeds and rainfall rates are likely to increase with continued warming. Island coasts will be at increased risk of inundation due to sea-level rise and storm surge with major implications for coastal communities, infrastructure, natural habitats, and resources. Most island communities in the Pacific and Caribbean have limited sources of freshwater. Many islands depend on freshwater lenses below the surface, which are recharged by precipitation. Changes in precipitation, such as the significant decreases projected for the Caribbean, are thus a cause of great concern. Sea-level rise also affects islands water supplies by causing saltwater to contaminate the freshwater lens and by causing an increased frequency of flooding due to storm high tides. Water pollution (such as from agriculture or sewage), exacerbated by storms and floods, can contaminate freshwater supplies, affecting public health.

Flooding will become more frequent and coastal land will be permanently lost as the sea inundates low-lying areas and the shorelines erode. Loss of land will affect living things in coastal ecosystems. For example, the Northwestern Hawaiian Islands, which are low-lying and therefore at great risk from rising sea level, have a high concentration of threatened and endangered species, some of which exist nowhere else. Hurricanes and other storm events cause major impacts to island communities including loss of life, damage to infrastructure and other property, and contamination of freshwater supplies. With further warming, hurricane and typhoon peak wind intensities and rainfall are likely to increase, which, combined with sea-level rise, would cause higher storm surge levels.

Coral reefs are particularly sensitive to the impacts of climate change as even small increases in water temperature can cause coral bleaching. Ocean acidification due to rising carbon dioxide levels poses an additional threat to coral reefs and rich ecosystems they support. Fisheries feed island people and island economies. Nearly 70 percent of the world's annual tuna harvest comes from the Pacific Ocean. Climate change is projected to cause a decline in tuna stocks and an eastward shift in their location.

Key Issues: (from USGCRP 2009 U.S. Global Climate Change Impacts in the United States)

- The availability of freshwater is likely to be reduced, with significant implications for island communities, economies, and resources

- Island communities, infrastructure, and ecosystems are vulnerable to coastal inundation due to sea-level rise and coastal storms

- Climate changes affecting coastal and marine ecosystems will have major implications for tourism and fisheries

The Alaska/Pacific Northwest/Islands Cultural Area Breakout Group Report - Participants' Comments

CURRENT STRESSES: What are the current stresses affecting the social systems, natural resources and economic sectors in your Cultural Area?

Alaska

• Expansion of offshore oil and gas development	• Scouring of salmon reeds
• Wild fires are increasing	• Sudden melting of snow, causing floods
• Community displacements and village relocation are becoming necessary due to sea level rise and loss of village lands to erosion and permafrost thaw.	• Unpredictable and extreme weather
• Insect infestations (e.g., spruce beetle)	• Loss of snow reserve and earlier Spring melt
• Leaking of sewers	• Scarcity of water
• Increase in temperature, leading to decrease in salmon weight	• Not enough housing for the population. Some of the housing that is available requires a lot of energy to heat

Pacific Islands

• Coastal inundation of homelands	• Ocean acidification
• Drainage problems, sewage overflow	• Inability to move forward and grow because of need for repair and maintenance
• Coastal erosion	• Sedimentation
• Forest fires – increased wildfire on grasslands	• Invasive species threaten native species
• Species habitat is shifting outside of treaty areas. High-elevation species and ecosystems are being lost	• Hypoxia makes some areas along the coast into dead zones for fish and crabs
• Infrastructure problems	• Lack of water storage systems
• Mercury pollution increases	• Treaty rights
• Destruction of culture	• Inter-tribal conflict, which makes indigenous people participants in their own oppression
• Lack of respect for elders who are not educated in the outside culture	• Destruction of traditional cultural properties
• Infrastructure problems	• Poor economy/seasonal jobs
• Not enough land to meet the people's needs	• Checkerboard land: Tribal land is too much interwoven with privately owned land
• Northward movement of disease vectors	• Increasing conditions for diseases such as heart disease, diabetes, cancer
• Government (tribal) system	

CLIMATE IMPACT: Consider how weather extremes, climate change and variability might either amplify or dampen these stresses, or create new ones?

Alaska

• Displacement of moose because of lack of ice scour	• Diseases in fish
• Changes in insect population numbers and distribution, increasing harassment of animals, people and allowing conditions for new species of vector borrne and infectious diseases	• Damage to infrastructure from flooding, erosion, and new freeze-thaw cycles.
• Danger from melting ice in travel corridors	• The thawing of ice cellars threatens food storage
• Changing snow and ice conditions impacting predictable and safe fishing, hunting	• Damage to barge transportation
• Mental anguish due to impacts to loss of traditional life ways and relocation.	• Unpredictable weather and thinning sea ice is creating dangerous travel and hunting conditions and can trap people far from home
	• Thawing permafrost and erosion causing damage to infrastructure in villages (e.g., water and sanitation) and resulting increased potential for disease

Pacific Islands

• Diversion of funding from ongoing needs to disaster relief • Loss of land when sea level rises • Increase in disease-bearing insects • In some areas, salmon are more abundant and diverse. Certain species of salmon may be increasing in response to longer ice-free times • Food: The majority of the indigenous community relies on subsistence hunting and gathering to feed their families. Stream flows are decreasing; some streams are drying up altogether. Food animals are migrating because of climate change, and species and ecosystems at the highest elevations are becoming lost	• Loss of ecosystems that supply food • Erosion of cultural and sacred lands • Climate change could make it even harder for remote communities to get fuel to heat and power their homes • Sea level rise will make it necessary for many coastal communities to relocate.

ACTION STRATEGIES: What coping or action strategies might address the additional stresses created by extreme weather events, climate variability and climate change, as well as helping to address existing non-climate stresses?

• Natural resources are indigenous culture! Climate change makes longstanding issues a matter of life and death. Climate change may be a vehicle to address these problems. • Plan according to the seventh generation principle: Consider the effect of today's decisions seven generations into the future. • Set expectations high. If indigenous peoples demand the best worldwide, their collective voice will be loud. • Focus on adaptability and local ingenuity • Disseminate the indigenous model of sustainability to audiences in the region • Capitalize on renewable energy for all power: lights, heat, and transportation • Learn to exploit new species for subsistence • Use retention beds for native wild rice and more fish beds to compensate food loss due to climate change • Design for the environment. Use more passive energy • Plan long term. Design new infrastructure to sustain the community and to withstand climate change • Include Native people at the table in all federal agency climate change initiatives. Encourage tribal college students to seek hiring in government agencies. • Use benchmark measurements, e.g. measurements of air quality on reservations, to be able to give a real response to the world • End the blood quantum policy. • Establish regional agreements for response to natural disasters • Communicate with people to the south for knowledge of what flora and fauna are coming your way • Hold every federal agency to its responsibility • Build partnerships around sustainable development • Implement policy driven by research	• Maintain indigenous ceremonial practices and spiritual knowledge, even in the face of displacement from homelands • Validate and reaffirm indigenous values with leaders, both of the tribes and of the U.S. government• Cooperate, rather than compete, both locally and regionally • Close the gap between Native and Western science. Support different ways of knowing; incorporate traditional ecological knowledge into mainstream research • Pursue best practices and be models for the rest of the United States and for the world • Upgrade fisheries to recycle the water they use in fish tanks, instead of pumping water from ground resources • Environment: Maintain native flora and fauna; maintain biodiversity • To improve energy efficiency, modify traditional housing for modern needs using local materials • Include Native Americans and Alaska Natives in the Intergovernmental Panel on Climate Change (IPCC); make sure they are recognized as stakeholders • Decide specifically what is needed – e.g., what limit must be set on temperature rise – and what the community is willing to sacrifice for the greater good • As a model of commitment, the Micronesia Challenge: An initiative to facilitate more effective conservation of marine and forest resources in Micronesia • Make affirmative declarations not to contribute to climate change • Establish partnerships through memorandum of agreement or treaty. Develop language reflective of the true intent from Northwest/Alaska region. Language that involves conflict resolution, not a waiver of sovereignty. • Communicate between communities to spread ideas for energy independence • Obtain true and honest cooperation from government officials: Insist on accountability • Make sure policies are heard internationally • Encourage elders to teach stories, traditions, and practices • Work for global acceptance of indigenous knowledge and values

INFORMATIONAL NEEDS: What new or additional information would allow people to better understand the linkage between the current stresses and weather extremes, climate variability and change?

• Media action to raise public awareness about climate change and the need to reduce carbon dioxide emissions • Access to resources to develop sustainable and renewable energy projects that reduce carbon dioxide emissions • Funding needed for protection of cultural resources and land • The rights enumerated in treaties and historical agreements • Enforcement of rules reducing fossil fuel emissions.	• Policy that allows government to distribute knowledge and values internationally • Knowledge of climate change's effects. How fast will the sea level rise? What new species are expected to be available for subsistence? • Funding needed for infrastructure and housing • The support of government at all levels: tribal, local, state, and federal • Regulation of offshore activity that may have negative impacts on marine resources

White House Listening Session

In response to a request by NASA and the organizers of the workshop, the White House sent three representatives from the Council on Environmental Quality (CEQ) and the Environmental Protection Agency (EPA) to the workshop to conduct a "listening session". The purpose of the session was to hear the direct experiences and observations of Native peoples who are disproportionately suffering the adverse effects of climate change. The representatives were Maria Blair Deputy Associate Director at the White House Council on Environmental Quality (CEQ), Karen Metchis, Senior Climate Advisor, EPA Office of Water, and Dr. Anthony Socci, Senior Advisor, EPA Climate and Energy Program.

Meeting participants expressed their views on environmental stressors and on climate change, its impacts and effects while sharing their proposed solutions and recommendations. A brief summary of their comments is listed below.

The session began with a summary statement that climate change has a disproportionate effect on Native Americans, Alaska Natives, and Pacific Islanders and some have compared them to the canary in the coal mine. Climate change is causing habitats to shift upward and northward. For example, the habitat of sugar maples, central to certain Native cultures, is shifting. Tribes are concerned about environmental justice aspects of climate change and pollution on Native peoples' health, and culture. Federal agencies have a responsibility to hear Native voices and to include their input about issues that affect Native lands. A consistent theme was that Indigenous people strongly believe that we are all relatives and the people in the White House should consider themselves related to the whole country.

The session continued for over 6 hours, with contributions from a large number of the Native participants. For the reader's convenience, in order to include as many of the participants' comments as possible, this workshop report has grouped comments into 2 sections: (1) issues of concern and (2) regional concerns.

White House Listening Session – Participants Comments by Issue

Agriculture and Food

- A spiritual life is based on agriculture. Traditional crops need protection from genetically modified crops. Lack of access to land and the inability to grow food has caused health problems such as diabetes in the Native American population. Things of value like health and happiness should be factored into the agricultural economic equation.

- There is a need for suitable agriculture and gardening techniques. The use of ancient ways such as grid terraces, three Sisters plants (corn/beans/squash planted at same time), crop rotation plus cover crops, no-till plus drill seeding, organic feed pastures for nitrogen as well as the use of beef cattle operation for green fertilizer in the spring. These techniques are green and more sustainable.

- Sustainable agriculture needs to be promoted in order to protect traditional seeds. Tribes are losing traditional foods.

- Wild rice, salmon, and white corn restoration initiatives are needed. It is important to think about the natural world as a relative to everyone.

- Consider the use of grid terraces and snow fences as examples of sustainable agriculture. Grid terraces at 6550-8500 ft. elevation provide seasonal extensioning with stones absorbing heat which in turn gains two weeks in both spring and fall. A one month extension of growing season is gained. Promote efforts to harvest winter snow as in snow fences. Peccary's pueblos, Kowhai pueblo, as well as other groups in Guatemala have started doing this.

- There is a concern for protection of Native rights. For example, hate crimes are occurring in some regions in which hunters are shooting at Native Americans. The federal government should work with states to ensure they do not take native resources and to enforce protection of Native rights.

- There are concerns about nutrition in Native communities. Promote discontinuing genetic engineering and additives into foods.

- It is recommended that the U.S. create programs that teach self-sufficiency for people so they may grow their own food. Local food production reduces CO2 emissions, mileage, and increases nutritional quality.

- The federal government should provide green labeling of foods including greenhouse gases per unit on labels, water intensity labels, and length of distance food traveled.

Communication and Consultation

- Tribes desire greater communication with CEQ and other related groups to communicate how traditional knowledge is being incorporated in decision-making, and to be able to share information from the White House into their own communities.

- The visions of the participants in this meeting need to be heard more often. The tribes need improved communication with the White House Council on Environmental Quality and other agencies. We need to be consulted in a more formal, regionally organized way, with ongoing dialogue rather than just isolated requests for input, and with respect for indigenous knowledge and culture. A more formal means is needed to address the loss of culture and biodiversity on which the culture depends. In addition, a means is needed for non-native people to be educated about Native issues.

- There should be a protocol for this kind of listening session; instead, there is a fear of sharing, which, in turn, creates concerns about how the continuation of this type of dialogue will be addressed in the future.

- There is a need for more consultation. The federal government should hold conferences with non-elected officials as well as elected officials. There is a need for building alliances with non-Native groups such as mayors, hunters, fishermen, and physicians to build healthier communities.

- The federal government should consider recruiting a small group of tribes to work with CEQ. EPA, and others to discuss national concerns. Initial contact has been made with EPA, USGS, NOAA and BIA.

- In law and policy, there is still a sense of non-Natives' dominance of Indian land. The United States needs to work with Natives as colleagues rather than as dependents. Research should be with, rather than about, Natives Americans. Indigenous nations need to be heard internationally; specifically, we need a vote at the coming climate summit in Copenhagen.

- Overall 565 Indian Nations desire to reduce CO2 and find ways to share that information.

Education and Capacity Building

- There is a real need for a means by which for non-natives can be educated on Indigenous issues. U.S. citizens should spend one year living in a Native community to better understand Native Americans and Indigenous ways of life.

- Sovereignty is a nation's ability to control its own destiny, but can't achieve it without control over power, land, and resources. U.S. people need to be adaptable. As land changes, people need to be able to change. Native people need the opportunity to become more educated about science and climate change.

- Tribal colleges and universities need more funding for infrastructure for sustainable approaches, like gray water recycling, green roofing, and solar power for personal computers and wireless devices. Sustainable development can provide for future generations; the U.S. government should support it on both Native and non-Native lands.

- More resources are needed for Native elementary and secondary education to support Native communities in getting into technical fields that require post-secondary education. Native Americans are significantly underrepresented in these areas. Tribal colleges and universities need funding for research, to address issues of local interest..

- There is a need to inspire tribal governments, empowering tribal communities through dissemination of climate change information. Educating tribal communities could be done by tribal colleges working with tribal governments. Outreach should include rural and isolated tribes.

- There is a need for diversity not monoculture. Demonstration projects are recommended and should be arranged for tribes or tribal colleges to arrange a package to be developed thus producing sustainability and diversity.

- There is a need for more extensive training in tribal communities, including environmental justice, to address local issues and it also is important to train communities in Traditional Ecological Knowledge (TEK).

Energy and Mining

- The federal government must stop unsustainable projects and further adopt wind, solar, and tidal energy. With offshore and coal, communities cannot survive. We must take serious reduction of emissions now.

- The federal government should implement a moratorium on any new oil gas and coal energy development on or near Indigenous lands.

- There is a need to conduct environmental epidemiology studies on energy development and health impacts in areas relevant to Native peoples such as the Emory River TVA spill.

- The Dine people have seen increases in cancer rates due to pollution from mining.

- Mining can put important archeological sites at risk and can do great harm to the physical world.

- White House should pressure senators to revisit the Environmental Justice Control Act to give Indigenous communities resources.

- Restoration sites for tribes need legislative support. It is recommended that a trust be put in place to allow access. Tribes The U.S. has an obligation to ensure that resources are available and recovered. Tribes are focusing on recovery and need it to be put into legislation.

Housing and Sustainable Development

- The federal government should support sustainable development of native and non-native communities including the 7th generation amendment to the U.S. constitution to protect air, water, and land for future generations. The only pockets of natural resources are on Indian lands because they manage for generations to come.

- The White House should look at examples of sustainable housing ideas in Indian country such as green roofs, water recycling, independent power, and wireless internet protocol. In Thunder Valley, Pine Ridge, youth led a sustainable development corporation creating a sustainable community.

- The U.S. government needs to examine the impacts of buildings on the environment. Buildings take 50%-70% of resources. Should consider source of our materials. Sustainability is about meeting needs of people today, and for future generations. In order to plan for the future; the opportunity is now to do something sustainably. We should create living buildings in symbiosis with surroundings, e.g., modular, climate responsive, low cost, biodegradable, elder friendly, and trendy.

- A shared community vision on sustainability should include support, sustainable materials, growing capacity locally, using local colleges, respecting rights of individual, utilizing power of community, creating a forum to share best practices, and designing with the principle that 'water is life. For example, Greensburg Kansas was destroyed in 1997 and rebuilt as a green community.

- There is a need for more incentives for tribal business to create matching requirements .

- EPA, DOT, and HUD have created model sustainable communities which are good models for creating a new cluster of ecological development. Agencies want to present these models as blueprints for other sustainable housing. The White House needs to find a way to convince the non-Native population to develop differently using sustainable approaches.

- HUD housing for tribes has decreased. On the Rosebud Reservation, only 20% of tribes are eligible for HUD housing while the other 80% of those who need it are disqualified, partly based on income and this results in homelessness. Maintenance is needed, while ¾ of money taken away such as DOE money for energy efficiency used.

Intellectual Property

- Intellectual property is knowledge of a community and a generational creation. There is a need to safeguard indigenous nations' stories, ceremonial information, carvings and songs through intellectual property right laws.

- It is advised that the U.S. adopt indigenous rules by going to Office of Patents to get permanent protection to guide land use recovery.

- There is a need to be able to integrate traditional and western science in a way to protect culture. Tribes are the best avenue.

- The U.S. should reexamine grants in order to protect traditional knowledge.

Language

- Languages are a repository of accumulated knowledge. Boarding schools performed Linquisticide and the U.S. government should assist with revitalizing indigenous languages. Languages carry a sacred and religious responsibility out to traditional territories, larger than reservations.

• The federal government should reexamine the 1954 Teehiton Legal Brief on title to land, Christian papal ownership of soil in which indigenous peoples were considered only "occupants".

• Native American languages are the repository of thousands of years of knowledge about the land, and Native people have a sacred responsibility to their traditional territories, but the U.S. government destroyed languages and the attachment to the land.

Mitigation and Sustainable Energy

• There is a need to disseminate information for wind energy development. When starting up, tribes did not know whom to contact for information regarding projects and development.

• Wind in the west and solar in the southwest is not enough. There is a need for alternatives like hydrogen fuel cell technology. Nuclear power, carbon sequestration, and the Reducing Emissions from Deforestation and Forest Degradation (REDD) schemes currently being formulated under the United Nations Framework Convention on Climate Change are false solutions. These programs fail to safeguard the future of and the environment and the rights of indigenous peoples.

• The real remedy is to reduce emissions to stabilize carbon dioxide in the atmosphere at 350 parts per million. The way to do that is through renewable energy and sustainable development. In sustainable development, the Native community has set a good example. At his inauguration, President Obama said wind and solar power are not enough; e.g., hydrogen fuel cells need to be developed.

• The Central Arizona Project (canal) focuses on a solar cap which would produce energy and reduce evaporation. A proposal is in the works. Also, BuRec built CAP for Phoenix irrigation, although, there is never enough funding or water for Indian lands.

• Blackfoot Tribal College was the first to put up a wind project in 1995. They are planning an off-grid system, not allowed to have more than 50% off grid, which would train faculty & students at the same time and promote understanding of local co-op policies.

• Every federal agency should analyze their CO2 footprint which should include wind power systems. To remedy this, a green federal power grid system should be established.

• The Environmental Justice project concerning flooding of Missouri River was selected by the federal government to make use of Western Area Power Administration which markets power. This will include nine of ten top wind states. It is designed to carry hydro, but WAPA is now buying coal power to meet hydro contracts. The U.S. should model "buy wind" power for hydro supplement rather than coal.

• There is a need for energy audits for aged buildings. The U.S. government should implement this.

Water

• Water has rights - it is an integral part of everyone. Water has many uses such as sacred uses and the hydrologic cycle. The U.S. should promote these in western science; it is lacking in this in this area.

• To understand water, we must use indigenous knowledge and look from beginning to end. There is a concern for the Mississippi River. At headwaters, it is clear, but, by the time it reaches Kansas, it is tainted, and at the mouth of the Mississippi, it is a dead zone.

- Tribal and treaty rights to water are being violated. USACoE is refusing to recognize Lakota rights to the Mississippi River. Tribes have advised the U.S. government to reexamine tribal rights to the Colorado River as well.

- The Muscogee Tribe has recommended improving water quality standards in the Penobscot River and Kansas River and increasing monitoring of nonpoint source pollution to identify sources of pollution.
- Tribes are concerned with the protection of the Baker Wetlands in Lawrence, Kansas. The Kansas Department of Transportation is planning to build a road through the natural wetlands environment. The Baker Wetlands are an essential part of the U.S. natural resources as well as the Lawrence community.

- There is a growing concern about drought and water quality. The U.S. needs to improve irrigation and water rights for food security. There needs to be better policies in place to keep the Nation's food supply secure. The Bashes Tribe went bankrupt now the groups have to drive long distances to get food and water.

- In the Southwest area of the nation, drought continues to grow and the need for tribes to haul water frequently is increasing.

- In another example of increasing water shortages, on the Santee Sioux reservation drinking water has to be purchased, because there is no source. We need to develop models of climate change impacts on Native Americans to bring attention to such issues and to create strategies to address them.

Science

- Native Americans are taking charge of own research and legal matters. They have their own tribal scholars, traditional knowledge and science. Native Nations are not dependent nations, but colleagues. The U.S. should consult Indigenous tribes as well as bring their research to the table; the research should not about us but with us.

- The U.S. Government and agencies like CEQ have failed to protect our culture and lands. There is a need to update NEPA to protect our culture and the species related to our culture. We feel that NEPA does not give justice to tribes.

- Discussions should include traditional ecological knowledge (TEK) as well as science and data. US government agencies need more formal consultation. Communities have a great role in their loss of culture and biodiversity and they are reliant on it.

- President Obama told the tribal people they are no longer victims yet there is no place for native scientists and their research.

- There is a need for studies of relocation, looking at examples of others across the world. This is not properly addressed and there is a need to look at this with more cultural sensitivity.

- Traditional epistemologies and Indigenous knowledge need to be integrated into western science regimes. Indigenous knowledge includes information that western science is lacking.

- There is a need for the federal government to break the boundaries on needed research(among science, culture, and intellectual property) and include funding tribes' research.

White House Listening Session – Participants Comments by Issue Geographic Area

EPA Region Five

- **Michigan**

  This area was the first nation near the St. Clair River of documented gender imbalance from pollution.

- **Minnesota**

  - East Coast tribes such as the Miox, Ojibwa, and Dakota migrated inland. There is a melding of indigenous cultures through loss of sacred sites from development. The people cannot access lands due to energy development. U.S. needs to uphold treaty resource rights to empower them.

- There is a need for an indigenous co-chair in the Air and Waste Management Association to encourage the improvement of air quality over Native lands.

- Lake Superior Chippewa Tribe in the Arrowhead Region of Minnesota has endured a hundred years of mining and extraction of iron ore, gold and palladium on an area over a hundred miles long.

- Lake Superior is a third of the world's fresh water source but it is contaminated by sulfide mining and continues to be impacted by additional aggressive mining activities.

- ACoE, Minnesota DNR are viewed as cooperators yet Native Americans' comments are included as 'footnotes'. Federal government has fiduciary responsibility to protect property rights of Native Americans.

EPA Region Six

- **New Mexico**

- The Navajo Tribe insists research on contribution to carbon dioxide of non-cleaned up areas as New Mexico is the potential target of restoration.

- The Navajo Tribe and other tribes of the Four Corners area are at risk for health problems and even survival. Mining pollution contamination from coal, oil, gas, and uranium has left the land is devastated and people dying from cancer, leukemia, etc.

- Peabody Coal, BHD agreements were made a hundred years which allowed eighteen hundred more oil wells that San Juan County agreed to has created high opposition by tribes.
- A new power plant is going up next to two others that are the worst polluters; one of which is the Desert Rock power plant so please help us stop it. Remand air permit transmission. Additionally, the plant has applied for carbon capture and storage which will contaminate groundwater.

- Fossil fuel projects were set up through the early 1900's agreements when Native Americans did not understand any English and were uneducated on the processes. The contracts are outdated. There is a need to renegotiate agreements and contracts to include informed Native input.

- The Navajo Nation requires federal funding for roads. There are very few paved roads in the area. For the first time, they had a child get an asthma attack due to the poor roads systems and resulting poor air quality.

EPA Region Seven

- **Iowa**

  - Coal fired power is the main source of energy for the area. It is a significant threat to public health and the environment and affects our overall quality of life. Consider Indigenous peoples as a sentinel species - we cannot separate environment from health. We need clean water and air.

  - We recommend for health care reform that you oppose expansion of coal in the plains. At this time, it appears that the hearing process is a rubber stamp for development

- **Nebraska**

  - The Sandista Nation is concerned about the low levels of the Missouri River as well as the back-up water which is due to sedimentation created by a lake. The people cannot drink the water due to pesticide and flooded pumps. All houses had water in the basement, and many in the area had to relocate twenty years ago.

  - We recommend that you remove the dams or improve their operations.

EPA Region Eight

- **Montana**

  - Hunting and gathering has been affected tremendously. For example, elk and deer are moving to new areas, making it harder to hunt and huckleberries are moving to higher elevations and no longer getting the rain they need.

  - The Flathead and Salish are becoming poorer tribes. They have to buy gas to go further to hunt and gather because there is less food available.

- **South Dakota**

  - Drought and environmental justice is an emphasis for Native American people. Overall, water management has been poorly handled. Tribes were told that the U.S. built the dams to move barges yet no barges have ever been brought to the area.

  - In 2004 through 2005, the Standing Rock Sioux Tribe faced drought. The people went thirty days with no water so the ACoE extended the pipeline to the Missouri River.

  - There was a drought in the area in 2006, but in the town of Bismarck, people were wasting water.

- **Wyoming**

  - The Northern Arapaho Tribe needs quicker turn around on water quality and air quality standards. In their area, coal bed methane creates 'produced' water. The area is surrounded by energy development which needs to be done in an environmentally sound manner.

- Jonah Gas Field is the second largest area and it produces the most degraded air quality. Water is extracted and disposed of in this area and discharged water produces a sodium film on the soil, therefore, groundwater impacts are substantial.

- Coal is on every reservation.

EPA Region Nine

- **Arizona**

  - Peabody Coal has a 'life of mine' permit dated up to the year 2040. The Hopi Tribe conducted an EIS on the area but the permit was signed without their knowledge and told it was "too late".

  - The Black Mesa Trust, Forest Service Hopi Energy Team and Office of Surface Mining Archeological Inventory - adhering to only 10% (40 of 400) yet succeeded in stopping a coal slurry plant.

- **Hawaii**

  - Coastal species and archeological sites will be lost to sea level rise.

  - Hawaii is home to many endangered species, including medicinal plants, but these species are not protected from invasive species brought in by people.

  - Shell fishing and seaweed harvesting have declined from impacts of climate change.

  - Mosquitoes in Hawaii could migrate to higher elevations endangering birds; loss of bird pollinators could affect plants.

  - We recommend relocating communities on smaller pacific islands; creating new solar farms; creating energy, education, work, and training opportunities in Hawaii; creating wind farms with underwater cables and geothermal; and developing models of climate change impacts on Native Americans.

  - Create energy, education, work, and training opportunities in Hawaii.

  - Develop models of climate change impacts on Native Americans in all US locations.

EPA Region Ten

- **Alaska**

  - In Alaska, most large-scale development of profit-based, carbon-based energy – natural gas, offshore drilling, and coal – is within the lands and waters of indigenous people. Reservations are being mined for coal and may in future be mined for tar sands; these processes are polluting.

- Climate change impacts are very severe where sea ice is receding and there are steep rises in temperatures.

- There is a need for financing of infrastructure for such support as reliable village drinking/washing water supplies, sanitation systems, fuel storage, and waste disposal sites – which will withstand permafrost thaw and erosion from sea level rise and strong storms.

- Mitigation of tribal lands, agriculture, and forests is occurring in Alaska. In Alaska, Pacific basins and islands are being displaced. Preparation for the effects of such displacement is needed.

- Research collaboration between indigenous knowledge and science, ensures that the best knowledge is available for Arctic problem-solving.

- There is a need for an increase in international communication of values.

- Alaska is 'ground zero' for U.S. energy policy.

- There is a need for large scale development for resources in territories of Indigenous Peoples, e.g., Yukon Flats, Outer Continental Shelf, Beaufort, Chukchi, Cook Inlet, and the North Slope.

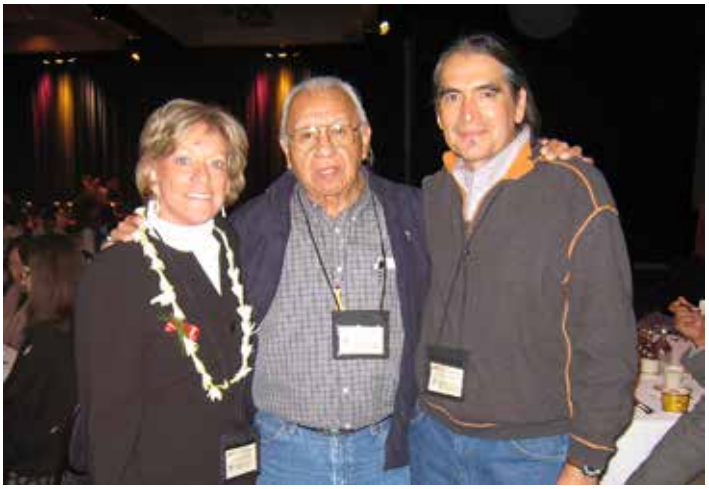
- Alaska produces a third of the nation's coal yet it is on the forefront of climate impacts; the canary is on life support.

- In Barrow, there is a concern about DOI Offshore leasing. The Department of Commerce is doing enforcement and cleanup 4,000 miles away from Alaska from Washington, DC so these concerns cannot be heard.

- Create a streamline process of communication with Alaska Natives and make them part of the system, don't just meet them in court.

- We recommend that all parties create partnerships through regional agreements such as memorandum of understanding, memorandum of agreement, and reinforcing treaties as well as language with conflict resolution; enforcement of mitigation and global acceptance of value of sustainable practices is needed.

Perspectives From the Community



The workshop was organized to hear from as many Native participants as possible, and while we tried to capture and transcribe most presentations for the report, the large numbers of excellent speakers exceeded our recording capabilities, so we must offer our appologies to those whose statements are not fully transcribed in the report. Instead, it became necessary to compile the essence of many discussions throughout the workshop in shorthand listings of "bullets" during the sessions.

"Sustainable agriculture may contribute to the effort to reverse climate change. Studies indicate that, with organic agriculture, soils become more alive and hold more carbon and that cycling of organic matter in the soil will help sequester a lot of carbon in the atmosphere." *Clayton Brascoupe*

Clayton Brascoupe,
Traditional Native American Farmers Association

Mr. Brascoupe represents the Traditional Native American Farmers Association (TNAFA), which was formed in 1991 out of a meeting hosted by a seed conservation group of indigenous farmers, primarily from New Mexico and Arizona, talking about issues with which they were faced. As early as 1991 some elders at the meetings said they had seen the weather patterns changing over the course of their lives.

"When the TNAFA started, young people seemed to be losing interest in farming. The Association set out to try to reverse that trend and has been fairly successful. TNAFA does training and sometimes brings people to workshops in areas related to sustainable community living. Workshop topics include home building, designing communities, and alternative energy.

There was a drought starting about 1996 that lasted 11 or 12 years. My children (who were small when the drought began and are now adults) recognized that our farm's productivity has only recently returned to what it was before the drought. The forecast is that drought cycles will be longer and more frequent. In between those hotter and dryer times, it may be cooler and wetter. In farming terms these are limiting factors; strategies to address them will be needed so that people can continue eating well, raising families and growing communities.

Sustainable agriculture may contribute to the effort to reverse climate change. Studies indicate that, with organic agriculture, soils become more alive and hold more carbon and that cycling of organic matter in the soil will help sequester a lot of carbon in atmosphere.

As farmers and herders and ranchers, Indians in the past did not rely on just one type of seed; varieties that thrived under various conditions helped them get through changing climate cycles. They embraced biodiversity and learned about it. In the United States now there are just four varieties of corn being grown commercially. In indigenous communities, there are thousands of land races of corn. When the drought began in 1996, many crop varieties had been lost; this made surviving the drought that much harder. Now there is an effort to grow as many varieties as possible. As part of this effort, I share my seed with anyone who asks for it. TNAFA encourages people and their communities and farm projects to grow as much as possible and to learn about growing specifically for seeds, developing seed libraries."

"You hear that Indian Country is the victim of a colonial policy, a system set up to make it possible to get the resources out of Indian Country with little regard for what was left behind. The legacy left behind was not only environmental issues but also psychological issues, resulting in intergenerational trauma. You hear about this as the past, but it is continuing." *Michael Connolly*

Michael Connolly,
Laguna Resource Services Inc.,
Utility Scale Wind Development

Mr. Connolly is a former aerospace engineer and has worked for his tribe at the Campo Indian Reservation since the early 1990s, in the reservation's environmental regulatory program, environmental consulting and renewable energy. He talked about wind power on Indian reservations and about government policies that exploit Indians.

"The Campo Indian Reservation is located in the southeast corner of San Diego County. It is small, about 25 square miles, with 350 people of the Kumeyaay Tribe. The United States is in the third surge of a renewable energy push. The first surge started with the oil embargo in the 1970s and ended when President Reagan took office and incentives to switch to renewables were undercut. The second surge occurred in the 1990s partly as a result of the Gulf War. Then, subsidies also went to both renewables and fossil fuels, with the result that many companies providing renewable energy did not have sufficient competitive advantage to survive. After 2000 a third push for renewable energy started. It continues, and seems to be building momentum.

In 2005, the Campo Reservation signed a lease with Superior Energy for a wind energy project: twenty-five, 2-megawatt turbines. These projects are complex, with a lot of technical issues. They require, among other things, road access, a substation nearby, and the right wind characteristics.

For this initial project, the benefit to the tribe is about $300,000 – $400,000 per year, depending on performance. Environmental problems that these types of projects bring can include bird deaths – especially near major flyways – bat deaths, noise, visual impacts (flickers from sunlight), aesthetic issues (do you want to look at turbines?), and limitations that turbines may impose on future development.

It has been said that Indian Country is the victim of a colonial policy, a system set up to make it possible to get the resources out of Indian Country with little regard for what was left behind. This system continues to this day. The tribes' ability to exercise economic control over their territory is hampered by the requirement to pay state sales and property tax. States have the right to collect property tax on reservations for property owned by non-Indians and to collect sales tax for sales to non-Indians, even though the services for which these taxes are supposed to provide – water, sewer, fire – are provided by the reservation, which does not benefit from the taxes.

Additionally, Indian Tribes are not allowed to float tax-exempt bonds, except for essential governmental services, like sewage treatment and water plants that service local population. Therefore, this good source of money is not usually available to tribes, although the stimulus bill has created an exception. Wind energy offers tax incentives, up to 60% of the value of the project – but, because tribal governments don't pay taxes, that saving is lost.

The current economic structure pushes tribes toward passive lease arrangements with the effect that outside corporations realize the bulk of the project profitability. Tribal control and ownership can create project losses that could cripple or kill a project.

This is colonialism, continuing to this day."

"Fecundity and fertility lie at the center of continuous creation that is reflected in our ideas about sovereignty. The area of sovereignty having to do with the control of production and reproduction - not just the reproduction of human beings, but also the reproduction of culture - is interwoven with issues of resilience and adaptation." *Katsi Cook*

Katsi Cook,
Mohawk midwife

Katsi Cook, a Mohawk midwife, mother, and grandmother is a highly respected women's health activist and advocate for environmental restoration in her community of Akwesasne. She shared some special thoughts about her community, traditional knowledge, and working at the intersection of reproductive justice and environmental justice.

"Fecundity and fertility lie at the center of continuous creation that is reflected in our ideas about sovereignty. The area of sovereignty having to do with the control of production and reproduction - not just the reproduction of human beings, but also the reproduction of culture - is interwoven with issues of resilience and adaptation."

The social knowledge of Indigenous people is part of traditional environmental knowledge. Consider this story from my Mohawk community at Akwesasne:

One day black ash basket maker Tehokwirathe (A Tree That Stands Out) was in his yard pounding black ash logs to make splints for baskets. With the back of a heavy axe, he would pound up and down in rhythmic movement on the thick black ash log. A group of men had gathered around him, sitting on thick tree stumps, just visiting and watching Tehokwirathe pound his logs. Every now and then Tehokwirathe would look up from his work. Several times he stopped pounding, standing quietly, wiping his brow. He would turn his head a full 180 degrees, scanning the horizon, listening then resuming his pounding against the loosening strips of the log. After several breaks like this, he suddenly dropped his axe and walked back into his house, abandoning his work. 'It's not a good day to pound logs', was all he said to his puzzled visitors before disappearing into his house.

When I heard this story recently, I wondered why Tehokwirathe had suddenly stopped his work. What indicators in the environment told him all those years ago that it wasn't a good day to pound logs to make baskets? Was it the weather? Were there too many mosquitoes? I was puzzled, and the storyteller - who had sat among the men gathered around Tehokwirathe that early morning long ago - had no idea either.

Later, on the same day that I heard this story, I was visiting my daughter-in-law's mother, Susan Rourke, who grew up in St.Regis Village, in her home just across the river from where Tehokwirathe lived at Spaghetti Corners. I mentioned this puzzling story to Sue because our new grandson had been given Tehokwirathe's name by his paternal great- grandfather Joe Rourke. Tehokwirathe had built Joe's home using only a hammer, a saw and nails. The memory of the skilled and versatile Tehokwirahthe would live on in our little grandson.

Sue Rourke's childhood memory held the key to the mystery. She recalled that there were a number of basket makers who thrived at Akwesasne in Tehokwirathe's day. She remembered waking in the morning to the sound of Tehokwirathe's pounding – 'duum, duum, duum...' in sequential rhythm that carried through the air across the river.

'Soon', Sue said, 'another basketmaker would start pounding logs, then another, until the pounding of logs joining Tehokwirathe's

rhythm grew into a synchrony of the sound of black ash logs being pounded, resounding through the village, and across the river from Snye where Tehokwirathe lived.'

This was the solution to the mystery. Tehokwirathe was a lead oscillator, a pacemaker, a sender and receiver of signals within a community of basketmakers. He had been listening for the sound of other basketmakers with whom to co-create a synchrony of pounding - 'duum, duum, duuum…'- like pacemaker cells in the heart or a group of fireflies flashing in darkness along the river. This had been Tehokwirathe's indicator for a good day to pound black ash logs to make the splints needed for the baskets Mohawks are renowned for. When he did not hear this social network of log pounders join in around him, he knew it was not a good day to pound logs.

These kinds of social networks are the key to our community continuity, sustainability and resiliency. Together, we reproduce culture. In sync, like a skein of sundancers, we are able to achieve more, together.

My sister-in-law, Loretta Afraid-of-Bear Cook, has shared with me the spiritual knowledge embedded in her ancestors' Lakota language, of doing things in what she terms, a Kapemni way, a family way of doing things together for a purpose:

When you have your family, when you're doing something in a Kapemni way, in a circular way, you are doing something for a purpose. You throw prayer to the universe and it comes back to you as protection, as holiness that you have to have so that you feel confident again to do these things... So, within that triangle circle, you need to teach that whatever you throw out to each of the Four Directions, you're throwing it out with purpose. You're throwing it out and it's going to come back to you, so you're ready for it. That's what Kapemni means.

In honor of the women and of life, I offer a prayer song that comes from her Afraid-of-Bear relatives. The song, Anpo inajji ki, is sung between 3 and 4 am on June 17 through June 21 at the American Horse/Afraid-of-Bear Family Sundance at the Wild Horse Sanctuary - the place where the Four Directions meet - in the Black Hills of South Dakota. The song acknowledges the morning star standing on the horizon with its promise of the breaking dawn:

The morning is standing
Look at it
All over the world
the morning is standing
Look at it
Hold this moment close.

Thank you Earth. You know the way.
Thank you, Grandfather Sun. You love the people.

"Increased sustainability is an exercise in Tribal sovereignty. It's the Tribal government acting to preserve its assets for generations using its own culture and its own inherent powers. Tribal governments have the unique ability to couple tradition and culture with science and technology to provide a future more secure than what science and technology alone would provide."

"The match between science and a broad view of how the world works is worth a lot." *Bob Ellison*

Bob Ellison,
Director of Land and Natural Resources for the
Shakopee-Mdewakanton Indian Reservation

Bob Ellison is the Director of Land and Natural Resources for the Shakopee-Mdewakanton Indian Reservation. He spoke about the Shakopee-Mdewakanton Reservation, home of the conference, and the community's sustainability initiatives. He thanked participants for coming to work on the climate change issue, which will have a disproportionate influence on Indian Country. "Increased sustainability is the Tribal government acting to preserve its assets for generations using its own culture and its own powers. Tribal governments are uniquely able to couple tradition and culture with science and technology to provide a future more secure than what science and technology alone provide.

The staff at Shakopee have created a sustainability plan and started to implement it. Sustainability begins with environmental protection, and environmental protection begins with resource assessment. This entails gathering information from elders and other community members, reviewing historical records, and doing surveys of habitat, flora, and fauna.

The next step in a sustainability plan is habitat restoration. Some places, like wetlands, are set aside, not to be built on. This produces lots of benefits: increased native flora and fauna, carbon sequestration, a reduction in the heat island effect, and retaining the cultural landscape that the specific culture of that tribe is based on. Prairie has been restored on steep slopes, to grow grass for buffalo and to grow fuel for nearby Koda Energy.

Finally, there is systems improvement. Examples at Shakopee are:

- The Tribe has put up a wind turbine that generates 1.5 MW and generates enough power for the reservation.
- Fuel is produced from food waste (vegetable oil).
- The community's wastewater plant is designed to have a small footprint. It uses new technology developed in Europe. It produces no odors or noises, and its effluent is used for groundwater recharge. Limits are met easily in all effluent parameters. The water irrigates the golf course.
- Pervious paving directs runoff from contaminated parking lots into an underground storage chamber from which it is taken to a bioremediation site where it is treated.
- The fire station has been retrofitted with solar water heaters, sky lights, and light sensors.

Mr. Ellison's department has 12 employees, primarily technical staff. The green economy has lots of jobs. For example, the wind turbine requires maintenance and wastewater plant requires operation. Most tribes hire two or three interns per year.

Mr. Ellison said students should not have to be told to study science. That should be just what people do, especially if they do it as part of their culture. The match between science and a broad view of how the world works is worth a lot."

"If you want people to represent you, it takes money and time, and you have to give them the space to be able to do so."

"Tribal governments can be moved in the proper direction if you ask, if you demand, if you participate. These [treaties] are proof that it was done in the old days and it is done today yet." *Frank Ettawageshik*

Frank Ettawageshik,
Executive Director, United Tribes of Michigan

Frank Ettawageshik is the Tribal Chairman of the Little Traverse Bay Bands of Odawa Indians and has been working to help protect and restore Great Lakes ecosystems in a way that is also faithful to the Nation's treaty obligations and trust responsibilities toward Tribal communities. Mr. Ettawageshik talked about Tribal government and its relationship to the people, as well as inter-Tribal treaties, citing current and historical examples.

"A broad range of tribal representatives from all over the United States are attending this conference and, yet, there are very few elected tribal officials in attendance. 'Where are our leaders?' 'Why don't they care?' These two questions were raised by other speakers. It is truly important for Tribal leaders to attend international meetings so that Indian Nation constituencies have representation. Some tribes have addressed this issue in their governing documents. In the constitution of the Waganakising Odawak (Little Traverse Bay Bands of Odawa Indians) of Michigan, the Tribal Chairman's first duty is ambassadorial. Yet Tribal leaders often get complaints that they are spending too much money traveling. They are accused of not being in their Tribal office and not being accessible enough to the people they represent. Balancing these two responsibilities is one of the toughest dilemmas for an elected official.

To be able to attend meetings, Tribal leaders need the support of their communities. They need community members to ask them to go to meetings, to support them at budget hearings, to support the inclusion of funds for travel, and to understand, if a leader is not accessible at home, that he or she may be away at an important national or international meeting. In other words, leaders need time, money, support and space to represent their people.

I will now cite examples of Tribal treaties starting with a 1791 peace treaty amongst the Ottawa, Chippewa, Lakota, Nakota, and Dakota. This was, according to Vine Deloria's scholarship, the first written treaty between Tribal governments. This treaty served as evidence in 1992 for the Little Traverse and Little River Tribes when they were seeking federal acknowledgement before the U.S. Congress. As this example shows, treaties are not all with the United States – a treaty between Tribal nations is no less an international agreement. In other examples, three Michigan tribes granted each other reciprocal hunting rights; a May 2009 agreement with the governor of Michigan addressed climate change; a 2004 Tribal and First Nations Great Lakes Water Accord was signed by representatives of 140 nations; the United League of Indigenous Nations Treaty was signed by 84 indigenous nations from Australia, Canada, New Zealand, and the United States since it was drafted and first signed at the Lummi Nation in 2007.

In conclusion, Tribal governments can be guided to respond not only to domestic issues but also to international ones. Tribal governments can be moved in the proper direction if you ask, if you demand, if you participate. These treaties are proof that it was done in the old days and it is still done today.

"Indians are not leaving this planet. This is where we live and raise up children, listen to Henrietta Mann talk and sing, listen to the drum, and dance, and make baskets and do our prayers. This is our hunting and gathering and harvesting area. It has to be protected." *Billy Frank*

Keynote
Billy Frank
Chairman, Northwest Indian Fisheries Commission

Billy Frank, Jr. of the Nisqually Indian Tribe is the dedicated, long-time Chairman of the Northwest Indian Fisheries Commission, representing the 20 treaty Indian tribes in Western Washington and promoting cooperative management of natural resources – a strong environmental leader and treaty rights activist.

"We are the treaty Indian tribes in Western Washington. We are salmon people. We have lived here for thousands of years. We depend on the natural resources of the Pacific Northwest to sustain our way of life. We are co-managers of this precious resource.

For more than 150 years, we have fought countless battles to protect the salmon and the fishing rights that we reserved in treaties with the United States. We are natural resources co-managers with the state of Washington of this precious resource and leaders in salmon recovery. For us, the fight to save the salmon continues where we live – every day in every watershed. I am a Grass Roots activist and have been involved in acts of indigenous resistance when needed for my people, such as fish-ins in opposition to state authorities. The Supreme Court Boldt Decision was a landmark decision that affirmed the rights of most of the tribes in the U.S. state of Washington to continue to harvest salmon and my people's treaty rights to catch 50% of the fish in our rivers. We are co-managers of this planet and natural resources like the salmon. When President Obama got elected, the Tribes were elated. He promised to pass some laws for us. We, the Tribes, want to help him. We want to make him successful.

Listening is one thing. Doing it is another thing. We listen to the mountains, prairies–that's who we are. We all fought for who we are to protect ourselves. We remember running from the U.S. cavalry and white people. We've got to make things happen. Whose going to take our place? We can sit on the Supreme Court on every bench. We can be the President of the United States. I've been waiting for 78 years for this President to come along. President Obama being our President started in the 1960s with the Civil Rights Movement. We marched with Martin Luther King for treaty and aboriginal rights. Today we can't forget why we are here. We are here for survival and survival not just for Indian people. The climate is changing. That is real. We live on every one of the rivers along the Pacific Coast. We manage 200 miles of ocean. We sit at important tables, yet we are left out of a lot of tables where key decisions that affect indigenous people and this planet are made. Whenever it is good for us, the Federal government, corporate and other interests will talk to us. When something is done against us, we do not sit at the table.

Natural resources is who we are. How important a cedar is to us, prayers, bundles we have to carry, and our children. President Eisenhower passed the 1954 Termination Act, which was signed into law and which terminated federal control of and federal benefits for many tribes. We fought that and drove it back. This country was trying to get rid of us in the past and is trying to get rid of us today. We are stronger than ever. We went through 10 Presidents and 7 governors in the state of Washington to appeal for our rights. We don't have room for more people in the state of Washington, yet they come. Trees are cut which hold water for all of us. The U.S. Government told our Indian Tribes that the government is suing us.

We are told we must now make agreements with local governments and states. The agreements have no funds for Tribes. In the Southwest, water rights for indigenous people are going nowhere. Corporations are the greed of our country. Tell it like it is. When

the U.S. Government got organized in our country, they tried to kill us off. We gathered, got education, and knew how to fight legally. Corporations took over the country and run the land. We want the law to be enforced. It is not being enforced. In the Supreme Court, nobody on the bench talks on behalf of Indian Nations. Nobody is educated on the Supreme Court about who American Indian/Alaska Native people are. It is not right. We are seeing a brighter side with President Obama.

When we talk about climate change, the Pacific Ocean is poisoned. 300 miles of it is a dead zone. There is no oxygen in the sea here anymore. The U.S. Environmental Protection Agency (EPA) asks for comment on the toxic world we live in. We drew a poison map. It relates to the Yukon oil spill. Nobody is showing the Poison Map because it tells the truth. Nobody in this country tells the truth anymore. We talk. We are the messengers for all of us. Rivers at spring time are low as can be. Today we have flooding and 70-80 m.p.h. winds. Tides are going lower.

Tribes have answers. Tribal people know what they are talking about because we live close to nature and observe nature every day. The U.S. government, universities, and corporations say: "I'm the expert." Corporations talk about natural resources in terms of "western science" and "money and marketing." Vine Deloria, Jr.'s vision about the moon, water, and the whole world was spiritual and true. Only you, the American Indian, Native Alaska, Native Hawaiian and other indigenous peoples have this vision. The white world is going to be coming through our doors. Native students need to get their master's and doctoral degrees in natural resources. Tell us how to balance the world now. The ship has been off course a long time. Our President is trying to bring the ship on course. Who is in charge? Not the U.S. President, Governors, nor Legislators. The U.S. Army took 2/3 of the Nisqually Reservation and has been shooting over our reservation since 1919. We have got about 25 years to do something. We and our children can start putting balance back in Mother Earth.

Indians are not leaving this planet. This is where we live and raise up children, listen to Henrietta Mann talk and sing, listen to the drum, and dance, and make baskets and do our prayers. This is our hunting and gathering and harvesting area. It has to be protected."

"Developing countries say there is a historic ecological debt, that they are paying a lot of the price of climate change, a problem they did not cause."
Tom Goldtooth

Tom Goldtooth,
Executive Director, Indigenous Environmental Network

Tom Goldtooth is a prominent leader for environmental and economic justice and the Executive Director of the Indigenous Environmental Network (IEN) – a global alliance for indigenous peoples focused on climate justice, pollution, and globalization.

"The concentration of greenhouse gases is becoming serious. The continuation of dumping carbon into the atmosphere is alarming, to the point where Mother Earth cannot absorb more. Carbon capture sequestration and storage, and other quick fixes like cloud seeding, ocean fertilization, carbon markets (offsets) – these are all false solutions.

The way to challenge this global crisis is through carbon emission reduction targets by industrialized countries. Indian nations are sovereign nations; they can put pressure on the United States through the State Department and demand that the United States go to Copenhagen and beyond with some very clear and stringent positions on reducing carbon emissions by 2020.

Industrialized countries are not stepping forward and making a commitment. Developing countries say there is a historic ecological debt, that they are paying a lot of the price of climate change, a problem they did not cause. Some countries have made specific demands for reductions by industrialized countries; for example, Bolivian President Evo Morales has demanded that by 2020 industrialized countries reduce emissions 49% from 1990. Pending legislation in the United States proposes 20% reduction from 2005 levels by 2020 – but that is just 10% below 1990 levels, and it is not good enough.

Any treaty agreed to in Copenhagen to reduce carbon emissions must also recognize the UN Declaration on the Rights of Indigenous Peoples, as well as the standard of free, prior, and informed consent. The U.S. delegation will protest that language in Copenhagen.

We demand climate justice now. Keep the fire going. Keep our ceremonies going."

"Indian leaders, especially warriors, need to be at these meetings [where legally binding rules are negotiated about genetic resources and indigenous knowledge] to defend the rights of indigenous people, that indigenous people are the owners, stewards, protectors of not only the life around us but also our knowledge systems." *Dr. Debra Harry*

Dr. Debra Harry,
Director of the Indigenous Peoples Council on Biocolonialism

Dr. Debra Harry, Northern Paiute from Pyramid Lake, Nevada, is the Executive Director of the Indigenous Peoples Council on Biocolonialism (IPCB), to assist indigenous peoples in the protection of their genetic resources, indigenous knowledge, and cultural and human rights from the negative effects of biotechnology. Dr. Harry spoke about the worldwide effort to commodify life and traditional knowledge.

"Current international discussions may lead to treaties over the ownership of traditional knowledge. The World Intellectual Property Organization (WIPO) has a mandate to promote and perpetuate intellectual property rights around the world and to develop an international, legally binding protocol that governs genetic resources (the genetic codes of living organisms), traditional knowledge, and traditional cultural expressions, with the goal of making both life forms and indigenous knowledge market ready, so that companies may profit. Similarly, in the Convention on Biological Diversity (an international agreement on biological issues), there is not one state that does not agree with the notion of commercializing life. In negotiations on these documents, getting recognition of the rights of indigenous peoples is virtually impossible. States are operating from the framework that they hold national sovereignty over genetic resources.

There has been no indigenous leadership in these discussions. Indian leaders, especially warriors, need to be at these meetings [where legally binding rules are negotiated about genetic resources and indigenous knowledge] to defend the rights of indigenous people, that indigenous people are the owners, stewards, protectors of not only the life around us but also our knowledge systems. The United Nations Food and Agricultural Organization is asserting ownership or control over all food-related genetic resoures, meaning seeds, making them available to others to develop new products, typically genetically modified seeds, perhaps with terminator technology. This amounts to the imposition of intellectual property rights over both life forms and traditional knowledge. Now, in the climate change discussion, indigenous peoples can trade traditional knowledge in carbon-trading schemes. It is important to know the end result before participating in these commercialization schemes.

That end result is to alienate whatever goes into the marketplace. What was cultural knowledge and heritage becomes a market commodity put on a one-way train out of the community, forever to be lost. The post-protection period of an intellectual property right is the "public domain" period, when the property belongs to nobody and is available for free and open access.

I propose including language in the declaration that asserts an indigenous position against genetically modified seeds and organisms and rejects the imposition of intellectual property rights over living organisms and over indigenous knowledge, and that reaffirms Indians' rights to protect these things within their own systems on their own terms, that is, to protect them in the Indian sense of seven generations and beyond, not to "protect" them in the commodifiers' sense of stealing what belongs to

Indians. I urge you to get educated and get involved, and to get Tribal leadership involved. Indians have to assert the right to protect what is theirs on their own terms."

> "It is often times hard to walk the two roads that we all have to walk. Many of us are traditional Indian people while, at the same time, we are responsible professionals. We have to remain committed to the future of our Indian people and work within systems that at times challenge that vision." *Stanley Holder, Gus Claymore*

Special Assistant to the Deputy Director for Policy, Evaluation, and Post Secondary Programs in the Bureau of Indian Education (BIE)

Gus Claymore,
Education Specialist for Policy, Evaluation, and Post Secondary Programs in the Bureau of Indian Education (BIE)

Stanley Holder (Special Assistant to the Deputy Director for Policy, Evaluation, and Post Secondary Programs in the Bureau of Indian Education) and colleague, Gus Claymore (Education Specialist in charge of Partnerships for the BIE), spoke about climate change education.

"I appreciate the work that Dr. Dan Wildcat has carried out in the area of climate change. He is a valued member of the faculty and management at Haskell.

It is often times hard to walk the two roads that we all have to walk. Many of us are traditional Indian people while, at the same time, we are responsible professionals. We have to remain committed to the future of our Indian people and work within systems that at times challenge that vision. Very often the controversy between advancing technology and preserving the environment present the same contradictions.

I had attended a gathering at Pawhuska, Oklahoma, some years ago. There was an elder from the Six Nations Confederacy that told of a prophecy of two snakes that landed on the East Coast of the Turtle Islands or United States. There was a black snake and a white snake. The snakes were beautiful and the people were attracted to them. However, wherever the snakes crawled, the land was left uninhabitable and the snakes' breath was poison and killed people that breathed it in. The elders' interpretation of the prophecy, and some that heard it, was that the snakes represented the British Government and the U.S. Government.

I believe that the snakes actually represent fossil fuel technology and atomic technology. This prophecy demonstrates that Indian people have always realized a responsibility to protect the environment for future generations and have had concern about the impact of technology that is not controlled. Indian people have been distracted from this responsibility by the pressure of poverty, and the pressure of providing food and housing, and surviving in often dysfunctional environments.

The challenge for the Indian community is to protect the environment through research, constantly observing and evaluating it, and working to make improvements to sustain our lives and the quality of life for future generations. This can be accomplished by building a base of people steeped in research, the scientific method, and committed to perpetuating Indian culture that supports a healthy environment. In recent years, due to the emphasis placed on reading, math, and language arts by No Child Left Behind, science and STEM-based curriculum and programs have diminished. To address climate change and other issue related to the environment, interest in science and environmental responsibilities needs to be reemphasized and, in some cases, reintroduced.

Tribal colleges, including Southwest Indian Polytechnic Institute and Haskell Indian Nations University, have brought opportunities to remote areas and populations that otherwise would not have access to post secondary education. How can we use technology

to advance and enhance education and provide STEM-based programs to remote populations of Indian students? One answer is distance learning, which helps educators share thoughts, teaching strategies, as well as sharing the concerns of Tribal people for education. Education and employment systems are needed in Indian country that give Indian children the opportunity to become scientists, economists, technicians, engineers, and mathematicians and to have the employment opportunities to stay in Indian communities and work with Indian populations.

President Obama has opened the door for a dialogue with Tribal people. This is an opportunity to develop an educational agenda that supports science and STEM-based programs in Indian country.

The BIE has developed a partnership with NASA that offers a two-week pre-service training program for teachers in the summer. NASA also provides distance learning opportunities to BIE schools for teachers and students. NASA is looking for ways to help parents and others responsible for families to be involved in these programs. The BIE has developed other partnerships, such as with Argonne National Laboratory, to support science and the development of green technology at BIE schools.

Preserving the environment is part of our culture and our responsibility. I appreciate the opportunity to participate in the Native Peoples/Native Homelands Climate Change conference and to make these comments."

"The needs are known. People cannot respond to them alone, in isolation, but must form partnerships. Natives hope to be the ones directing the partnerships, saying what needs to be done and how to do it, with partners following Natives' lead." *Dr. Cynthia Lindquist*

Dr. Cynthia Lindquist,
President of Cankdeska Cikana Community College (Little Hoop) and Executive Committee member of the American Indian Higher Education Consortium (AIHEC)

Dr. Lindquist is the President of Cankdeska Cikana Community College and an advocate for Indian women's health, community medicine, and rural health. Dr. Lindquist spoke for Carrie Billie, AIHEC president, whose arrival had been delayed. She thanked her listeners for making the trip to attend the conference. She expressed appreciation for the way the conference had opened: with Native American songs, prayers, and music, signifying conference participants' relationship with each other and with Mother Earth.

Dr. Lindquist welcomed participants on behalf of AIHEC. AIHEC serves about 30,000 students across the country, about 80% of them Indians. Most tribal colleges and universities (TCUs) are reservation-based and serve a respective Tribal Nation. Dr. Lindquist thanked NASA, Dr. Maynard, and Mr. Spears, as well as the Intertribal Council on Utility Policy, Honor the Earth, and the Indigenous Environmental Network, for the conference.

"The needs are known. People cannot respond to them alone, in isolation, but must form partnerships. Natives hope to be the ones directing the partnerships, saying what needs to be done and how to do it, with partners following Natives' lead.

Climate change is a serious issue, and a complex one; there is also complexity in the possible responses. Many Natives do not understand how climate change relates to everything about the way we live, from plastic bottles to recycling to what goes into reservation landfills and how that potentially affects the water table. Addressing this requires strong partnerships and building collaborations is what this conference is about.

People in Dakota/Lakota country are concerned about the seventh generation to come. Tribal college students exemplify that kind of concern. Across the country, Tribal colleges are teaching traditional knowledge and applying it to climate change. Members of

the indigenous community need to help each other, to go forward in a good way. The relationship with NASA is a good one; it is what is meant by "We are all related."

I invite participants to enjoy themselves, meet one another, build networks, enjoy the deliberations, and keep growing and learning together.

Mitakuye oyasin…we are all related."

"Through our ceremonies there is healing, and in our prophecies the healing has begun. Indians will heal together, we will come together in spirit, because this is a crucial time, a time when Indians will be a voice for all – two-legged ones, four-legged ones, winged ones, and the ones that swim and crawl. Let prayers, not global disaster, bring people together with a good heart and a good mind." *Chief Arvol Looking Horse*

Chief Arvol Looking Horse,
Dinner/Blessing/Remarks

Chief Arvol Looking Horse is the 19th Generation Keeper of the Sacred White Buffalo Calf Woman Chanupa and is widely recognized as chief and spiritual leader of all three branches of the Sioux tribe.

Chief Looking Horse talked about being born and raised on the Cheyenne Reservation and said that those were dark times, because Indian ways were outlawed. Indian children were sent to boarding school with the philosophy "Kill the Indian and save the man." When Chief Looking Horse was 12, in 1966, he was given the responsibility of being the 19th Generation Keeper of the Sacred White Buffalo Calf Woman Chanupa. They said people should not speak out of anger or hatred that they must speak from their hearts and sing from their hearts.

Chief Arvol Looking Horse wished peace and blessings on his listeners. He began with a statement that was made in 1996 on sacred sites: "We are at the crossroads. Either be faced with a lot of chaos – disasters, tears from our relatives' eyes – or we can unite spiritually and globally." Then he continued.

"It is sad to see what is happening upon Unci Maka, Mother Earth. American Indians and indigenous people from other places have the same message: that Mother Earth is sick. In prophecies, there was talk about big winds, sicknesses, a time when the animal nation would show its sacred color. In the story, the White Buffalo Calf Woman bringing the sacred bundle to the people said, in time to come, she would return and stand upon Mother Earth, as a white buffalo calf. Then there would be great changes, Earth changes, climate changes, and people would go back to the sacred sites and pray where the spirits live, the sacred sites, sacred to the Great Spirit. On June 21, the longest day of the year, sacred sites are honored. On that day those who pray can create an energy shift upon Mother Earth.

Participants in the Native Peoples Native Homelands conference are seen as leaders. Indians are key in this new millennium. Indians have many prophecies. When I was young, I was told the elders' words: that life is beautiful, everything upon the Earth; that everything that moves has a spirit; and that Indians cherish life, especially Grandmother Earth.

A man without spirit is sad and will hurt many people. But, through our ceremonies there is healing, and in prophecies the healing has begun. Indians will heal together, will come together in spirit, because this is a crucial time, a time when Indians will be a voice for all – two-legged ones, four-legged ones, winged ones, and the ones that swim and crawl. Let prayers, not global disaster, bring people together with a good heart and good mind. I ask you to bring a message with one prayer: that the Tribes can be as one to the Creator, can create an energy shift, because, in their spiritual ways as First Nations, they have their dreams and

faith. Now we have a President who recognizes Indians as Native American people and who says, 'I believe in change.' I ask you to come together in prayer on June 21, stop using styrofoam cups, and think about the environment: each one can make this environment beautiful. I wish blessings on all of you."

"Humans are but a small part of the whole, and are not gods. As such they are responsible for the space they occupy on the great sacred circle of life. They exist as co-equal partners with everything in the universe, upon which they depend for their very existence. All life, is not only related, but it is interdependent, as well." *Dr. Henrietta Mann*

Dr. Henrietta Mann

Dr. Henrietta Mann, Cheyenne enrolled with the Cheyenne-Arapaho Tribe, the Founding President of the Cheyenne and Arapaho Tribal College and currently serves as Emeritus Professor of Native American Studies and Special Assistant to the President at Montana State University, Bozeman, is a strong leader in preserving Native American language, culture, traditions and land.

"I would like to begin with this expression of gratitude for:
Life: the ability to see, hear, touch, smell, and taste
The spirits of this place
This beautiful day
Our grandparents
You, and especially for
Traditional knowledge, which provides the power for our journeys on Earth.

We have been blessed with being indigenous, xamma-voestaneo'o, the natural, ordinary simple people of Earth. What a blessing and a responsibility. For proper context, let me share a brief excerpt from Cheyenne Creation about this Earth, upon which we live out our lives: In that long ago time, Ma'heo'o created Earth, named her 'grandmother', as oldest woman, first woman, the mother of everything that is. Ma'heo'o viewed Earth in all her glory, and thinking with the heart, proclaimed her to be the most beautiful of the entire creation.

All things are her: Her skin is the soil of Earth, the land. Trees and plants are her hair; sweet grass, sage, cedar, and juniper are her natural perfumes that are used as sacred incense. Flowers are the colorful and beautiful ornaments with which she decorates her hair. Rocks are her bones, her skeleton or protective skeletal framework that provides geologic form and structure. Water is her blood that flows throughout an immense circulatory system, which in humans is referred to as the 'oceans or rivers within'. Her internal organs include coal, petroleum, and natural gas, as well as other valuable elements such as gold, silver, and copper.

Many indigenous people know this Earth to be female, a loving being who has nurtured life continuously and inexhaustibly since creation. All life comes from her. She is first mother - there is no other, and she is alive.

Quoting once again from Cheyenne creation: Not wanting Earth to be alone, Ma'heo'o created two beings, South Man and North Woman. Too powerful to dwell together, however, they alternately came and went across the surface of earth bringing the four seasons, in a predictable cycle. Depending upon which of them was with Earth, they brought either the rains or the warmth of spring and summer or the yellow leaves of fall and the cold and snow of winter. Earth was still alone, so Ma'heo'o created human beings to keep Earth company, and who were to live in interdependence with all of creation. They were a happy people at the sunrise of creation.

The further the people walked the Road of Life, however, the more difficult it became. They began to experience conflict, lawlessness, epidemics, and starvation. Ma'heo'o took pity upon them when they were facing famine and the possibility of extinction by sending a prophet to each of the two groups of Cheyennes. Having received their covenants and accompanying ceremonies, the prophets instructed them in their proper care, which are their greatest resources against starvation and extinction. Through the ceremonies they annually renew themselves and the entire world. Their survival is guaranteed so long as they care for their sacred objects, observe their ceremonial duties, and remember the prophets' teachings. The prophets came to the Cheyennes to save them.

After living with them for four long lives of a person, one of the prophets, Sweet Medicine, sadly gave his farewell prophecies. Included among them are two that bear upon climate change and global warming, which were to occur sometime after the coming of the strangers from the East. He predicted the Earth would burn, which is the Cheyenne way of describing global warming, the place we have now reached on the Road of Life. He also warned them about weather changes, and that they needed to be vigilant and watch for these changes from the windows and doors of their homes.

Native peoples are keen observers and are aware of their environment. Since our ancestors have lived long on this land, and handed down through the generations their valued ancestral and tradition knowledge, we know that something is wrong. Climate Change is upon us, and it seems to be everywhere and accelerating, in what has been described as 'fast-forward'. Water is a shrinking natural resource, and there are fearful predictions of water shortages. Indigenous people must guard their water resources. However, bottled water has become quite a business. According to Beverage Marketing Corporation, last year alone, Americans drank 8.7 billion gallons of bottled water, down from 8.8 billion for the previous year. According to Food & Water Watch, more than 17 million barrels of oil - enough to fuel one million cars for a year - are needed to produce the plastic water bottles sold in the United States annually.

Water shortages are causing droughts, which also mean the expansion of deserts. Currently, deserts cover about one-third of the Earth's land surface. The Great Basin Desert of North America ranks as the tenth largest desert of the world. How much larger will it become with global warming?

We are experiencing more frequent, abrupt, and severe heat waves. The New York Times reported on November 14, 2009 that the Leatherback Sea Turtles of Costa Rica, who have dwelt in the Pacific for 150 million years, are casualties of global warming. Gender is determined by the egg's temperature during development; consequently, water temperatures higher that 89.6 degrees can result in an all-female population, and ultimate extinction.

Ice caps and glaciers are melting at a quicker rate than projected. This is affecting the polar bear people, who have to swim further out into the sea to find food, and without stable ice floes, some of them are drowning.

Sea levels are rising with resultant erosion and disappearance of coastlines. This is adversely impacting some Alaskan villages, which are literally falling into the ocean. The cost of relocation is astronomical. For example, relocating the village of Kivalina, population estimate 399, could cost $54 million.

Permafrost is thawing. Thawing permafrost has caused what is referred to as 'drunken trees' or 'drunken forests'. Their under-developed, shallow roots are weakening, which is causing the trees to tilt at radically different angles. It also is causing house and building foundations to buckle and heave, making them uninhabitable or unusable. Dug into permafrost, some native ice cellars have water dripping down into their food stores, which is an uncommon situation.

There are predictions of more intense storms, such as hurricanes. What more need be said since our country has already experienced the devastating toll of Hurricane Katrina in New Orleans.

Another unusual weather phenomenon that was sighted in March 2008 in northern Indiana is called 'Thundersnow' or 'Thunder Snowstorm'. It is essentially a thunderstorm, but it is accompanied by snow rather than rain. The snowfall suppresses the sound of thunder, but the lightening is still visible. Thundersnow is fairly rare, and an average of only three such events is reported per year.

Climate change is also causing the extinction of plant and animal species and the loss of biodiversity. What is just as alarming as the loss of biodiversity is the loss of linguistic diversity. Studies have shown that English is declining as a first language, but it appears to be the language of science. With the mass relocation of millions of environmental 'refugees', it is difficult to imagine the pressure that is going to be placed upon languages as cultures are blended. This will place a heavy burden upon education systems, as well. Many relocated people will be forced to learn the new language spoken in their sanctuary, or become multilingual. Their unique ways of life and expression will be lost. It is not enough that native languages have had to withstand the historic eradication attempts of the federal government, church, and school, now climate change is posing even more of a threat. Indigenous peoples were given their divine and unique languages at creation. Languages and culture are intertwined and one cannot have one without the other. Language is used to express people's understandings of this titanic universe and their relationship to their environment. This knowledge is usually passed by word of mouth down through the generations. Can any of us understand the pain ISHI must have felt when he had to live with the horrendous silence imposed by being the last person to speak his mother tongue?

Thus, when a tribal elder dies, essential knowledge of the world is lost forever, because it lives only in the mind of that individual. Sadly, the traditional knowledge base becomes so badly eroded that it will never to be regained, and we are diminished beyond imagination. National Geographic News reports that a new study has identified five global hotspots where languages are vanishing most rapidly. Included along with eastern Siberia, northern Australia, and central South America are Oklahoma and the Pacific Northwest, both of which have significant native populations. Native peoples have known for some time that their languages are at risk, but it has now escalated globally to a language crisis along with the climate crisis.

Languages and culture are inseparable twins, and indigenous cultures have evolved over time on this Earth. Native peoples are Earthborn. They come from the Earth. They are Earth. They live out their lives on Earth, and ultimately, they return to Earth. Earth is an altar, the place from which they send their prayers out to the universe. Native spirituality is Earth-based.

To reiterate, for xamma-voestaneo'o , the natural, ordinary people of this land, Earth is either mother or grandmother. Indigenous people are her kinfolk; they are related to her in much the same way they are related to each other and to everything in this vast universe. According to native philosophy:

Water is life. Life is Water.
You are water.
You are earth.
You are air.
You are fire.

Everyone and everything else is made up of the same four basic elements. They live in a vast universal ocean of relations, from the smallest microbe to the enormous ball of fire known as the sun, and everything in between. The Earth's moon and only natural satellite also is a relative, and is viewed as a universal grandmother. She influences women's menstrual cycles and initiates Earth's ocean tides with her gravitational tidal force. On October 9, 2009, the U.S. launched a moon bomb, and about a month later, NASA announced the discovery of proof that water exists on the moon.

I can only ask what the impact will be upon the ocean's tides and marine life, upon the gestational processes of women, and upon climate change. We must truly be committed to maintaining ecological integrity.

Humans are but a small part of the whole, and are not gods. As such they are responsible for the space they occupy on the great sacred circle of life. They exist as co-equal partners with everything in the universe, upon which they depend for their very existence. All life, is not only related, but it is interdependent, as well. We depend upon all life forms for our continued existence - we depend upon water for life. Mutuality and reciprocity are indigenous hallmarks.

Indigenous children are beloved. They deserve an environmental stress-free future. Looking to the current generations of Earth, it is appropriate that those of us here have accepted the challenge of our lifetime. Indigenous knowledge traditions can contribute different cultural understandings and perspectives on climate change. Just as Sweet Medicine came with new teachings, let us embrace and create new knowledge, accepting the fact that knowledge is power, and teach the world to become environmentally literate. Just as there is the technology to fire-proof or water-proof, we must climate-proof all our relatives.

"The nation needs a paradigm shift."

"I urge all of us, especially the students to do every little thing you can in your own life. That is what we need to do to shift this country." *Kandi Mossett*

Kandi Mossett,
Indigenous Environmental Network,
Campus Climate Challenge

Kandi Mossett has been an international activist in environmental and health issues and leader in the Indigenous Environmental Network (IEN), where she initiated the Tribal Campus Climate Challenge, to do within the Tribal community what the Campus Climate Challenge does elsewhere: work within schools to encourage more environmentally sustainable policies. Ms. Mossett spoke about the importance of everyone making some improvement, however small, in living in an environmentally responsible way. "Special program issues in the Tribal community include very small student bodies – Tribal college enrollments range from 32 to about 1,000 students – and include students who have many other responsibilities, such as children to take care of, or who are poor.

Global warming is so overwhelming that students may avoid thinking about it. I, myself, had the experience of being stuck in apathy about climate change shortly after I completed my master's degree in environmental management in 2006 because the problem seemed too big. My answer: You have to start somewhere. It's been said that you have to do more than change light bulbs – but changing light bulbs may be a good place to start for those who don't know what to do. Some girls' and boys' clubs have had tree plantings, where students get the community involved. At community gardens, elders and youth come together and work in the gardens and talk to each other.

Instead of buying plastic water bottles, one can get a refillable container and use it. Instead of using Styrofoam coffee cups, one can carry one's own coffee cup. Each person has the power to make changes in the way he or she lives. These changes are not easy but they do make a difference because production is driven by demand: companies will continue to supply products that are detrimental to the environment as long as customers continue to buy them.

Plastics do not break down. There are huge piles of garbage in the ocean, one the size of Texas. The nation needs a paradigm shift. Each person needs to look at his or her carbon footprint. It is hard, but each person needs to do every little thing possible in his or her own life to cut down on carbon dioxide emissions, in order to shift the country. The United States makes up only 5% of the world's population, but we produce 25% of the world's pollution, and carbon dioxide emissions continue to rise. Atmospheric carbon dioxide is now at 387 parts per million, the highest level in human history. It is people that have changed things.

To get carbon dioxide back down, part of the answer is to shift away from coal. The Northern Cheyenne are fighting against coal development; this effort has been complicated by tribal politics. Tribal people are being targeted for mining because they have

resources – coal, oil, uranium, natural gas – on their lands. Native Americans suffer most from the effects of mining, with cancer and other diseases. The water in North Dakota is contaminated with mercury, which comes from coal. Tribal leaders have allowed mining because it has seemed economically necessary, but it does not have to be that way: reservations have wind resources, solar resources, and traditional knowledge.

Replacing just one light bulb will save over 3,000 lb of carbon dioxide every year from going into the atmosphere. Tribal college students are onboard, but there is a lack of funding, and they are spread out all over. The essential element that is missing is school administrations and Tribal governments. A few exceptional Tribal governments – including the Blackfeet and the Menominee – are doing many good things like preparing greenhouse gas inventories.

Things can start at a small scale. For example, Henry Red Cloud did solar panel installations; seeing them, other people wanted them. People can start their own gardens, and go back to canning foods. It takes work. Fifty years from now, things will be very different. We may be having wars over water. Indigenous peoples should prepare for it. People need to start living sustainably and to get back to localized, sustainable economies. Start by taking baby steps – stay away from the plastic water bottles; take your own coffee cup on the road; buy a power strip so you can easily turn everything off at night; turn lights off when you are not in room.

Nuclear power is not an answer, because it means digging up uranium."

Ms. Mossett thanked her listeners for allowing her to speak to them and apologized for speaking in front of elders. She suggested forward thinking, signing the conference declaration and taking it to Copenhagen, including taking students to Copenhagen and making indigenous voices heard.

"NIARI's study pointed out a shared sense of community within indigenous peoples. As the impacts of climate change bear down, the community needs to strengthen these ties and to consider what kinds of steps can be taken to protect communities." *Alan Parker*

Alan Parker,
Northwest Indian Applied Research Institute

Alan Parker, Chippewa-Cree, is Director of the Northwest Indian Applied Research Institute (NIARI) and an Evergreen State College faculty member with extensive experience in Indian legal and policy issues.

"Several years ago NIARI carried out a study on the impacts of climate change on indigenous peoples of the Pacific Rim. They found that huge glaciers in the area have declined rapidly in the past 10 years, many disappearing entirely; that climate change has had an impact on salmon and shellfish, which were the basis of the lives of tribal people in the Pacific Northwest; and that climate change has degraded the habitat that these species depend on, while new species, some of them dangerous, have moved north into the Pacific Northwest.

What can be done about climate change on a cooperative basis, within the leadership of the Tribal nations? A strategy was developed several years ago under sponsorship of the National Congress of American Indians, with delegates from U.S. tribes, First Nations (Canadian Indians), and Southwest Australian aborigines working at the Lummi Reservation. These delegates agreed to create a United League of Indigenous Nations, a group focused on climate change impacts and the united effort they could make. The work done under the United League's sponsorship was presented recently at National Congress of the American Indians, with the participation of the national leader of the Assembly of First Nations, Grand Chief Shawn Atleo. The week before the Native Peoples Native Homelands conference, the National Conference of American Indians and the Assembly of First Nations sent to President Obama and to Canadian Prime Minister Stephen Harper a letter asking for representation in climate change deliberations. President

Obama's representatives replied, saying Tribal political leadership would be included in the United States delegation to the November United Nations Climate Change Conference in Copenhagen. It is important to be at the table.

NIARI's study pointed out a shared sense of community within indigenous peoples. As the impacts of climate change bear down, the community needs to strengthen these ties and to consider what kinds of steps can be taken to protect communities. AIHEC is in a position to be engaged and to lead at the community level.

The study's recommendations are to:

1. Establish a focal point in the community to gather relevant information as scientific work is done and findings are released;

2. Take steps to secure, use, and access water supplies;

3. Take steps to secure food sources, both traditional food supplies and other possible stable sources of food at the community level, and consider arriving new species and how to make use of them for food;

4. Reach out to surrounding non-Native communities and work with them to plan and protect; and

5. Pursue renewable energies.

For more detailed info on United League of Indigenous Nations Treaty, go to *www.indigenousnationstreaty.org and www.ulin-web .org."*

> "The young generation must look to the past to look forward. People once lived sustainably. It was a hard way of life, but we took only what we needed."
> *Nick Tilsen, Scott Moore*

Nick Tilsen,
Thunder Valley Community Development Corporation, and Scott Moore, BNIM Architects

Nick Tilsen, Oglala Lakota, is the Executive Director of the Thunder Valley Community Development Corporation, a grassroots sustainable development organization, and an activist community organizer. Scott Moore is an architect and project coordinator on Pine Ridge with BNIM Architects of Kansas City, concentrating on sustainable communities. They spoke about sustainable community and housing in the Native American community.

Nick Tilsen:
"The young generation must look to the past to look forward. People once lived sustainably. It was a hard way of life, but we took only what we needed. The idea of Manifest Destiny was the start of overconsumption, creating conflicts over resources and over our way of life. The things done to destroy us led to the industrial revolution, which started the planet's warming, while our culture was attacked and our identity as Native People was taken from us. The Earth was being destroyed while we were being destroyed. We have started a movement to break out of that, to be proud to be indigenous. Young people have been returning to traditional ceremonies, which give them a sense of identity and empowerment.

In a ceremony the ancestors asked us how long we would let other people decide the future for our children. They admonished us to quit operating from a place of fear. Then we started an organization of young people and created a vision for the future: a healthy, safe community with young people learning our culture, and we created a mission statement: 'Empowering Lakota youth and families to improve the health, culture, and environment of our communities through the healing and strengthening of cultural identity.' Using local volunteers and donated money, we built the Thunder Valley Community House, a cultural center. We also started a youth entrepreneur project. We got young people active in community, in culture. All our efforts focused on self empowerment, passing culture on to the young, promoting a healthy lifestyle, putting up tee pees. Ultimately we decided to move

away from individual projects and instead to create a whole community. Our plan is to create a community using renewables, thinking of the health of the community and the environment."

Then Scott Moore spoke:
"BNIM has been part of the movement toward green architecture. It uses an integrated approach to creating buildings and communities, on the theory that whatever we build affects human life directly. BNIM has become involved with sustainability projects. A BNIM project started the Leadership in Energy and Environmental Design (LEED) green building rating system. Beyond sustainability, BNIM looks to restoration – for example, improving energy efficiency. Sustainable design meets the needs of the present without compromising the ability of future generations to meet their own needs, keeping in mind the welfare of people, the planet, and prosperity. Thunder Valley CDC is trying to create a model that stands for something different, a new way of thinking.

There is a correlation between the healing of indigenous people and the healing of the planet. This community is healthy for the bodies, the culture, and the environment of the children it raises."

> "If we are going to save the Earth, we need to communicate with creation. I advise you to go back to creation. Talk to them. The only way we can save our grandmother the Earth is to get reattached. I admonish young people not to wait. It's good to be free. It's good to communicate with your relatives."
> *Albert White Hat*

Albert White Hat,
Professor Emeritus, Lakota Studies, Sinte Gleska University

Albert White Hat is Professor Emeritus of Lakota Studies at Sinte Gleska University in South Dakota as well as distinguished educator, author, linguist, tribal and spiritual leader. "Before I came to this workshop, I prayed about the wisdom to give tonight. I remembered being at a Sun Dance, a time of renewal for both the tribe and all the People and the Earth. And an elder woman cried and said: "Look how pitiful our Grandmother (Earth) looks. We must do something." We took care of this land for centuries. We know how to do it.

In 1880, I couldn't be an Indian. The Federal Government enforced non-Indian policies on Indian people in many different ways. If we practiced any traditional ceremonies, when we died we were buried outside the cemetery. The preachers would tell you how difficult hell was to put fear in you. In Kent, South Dakota, there was an insane asylum. Medicine Men who practiced our traditional religions were put there. These kinds of things undermined our way of life. But my grandfather always told stories about our way of life. He had visions of riding across the prairie. He mentioned a word which he said means "to greet and embrace a relative". The missionaries took the word and changed it to the word "prayer." You bow, kneel and you worship a Supreme Being. When you learn this way of praying, you only focus on one imaginary God you expect to do everything. You forget your relatives. Words are important. How you forget your language. Our traditional language is a beautiful language. I cry in it, dance it, express joy in it, and pray in it.

Medicine Men were practicing secretively in the time of repression. I sat in ceremonies. I sang to the Spirits coming in to the lodge. We didn't lose any of our ceremonies and ways and songs. We still have everything. Some of our people who were Catholic or Episcopalian said to forget our language and get modern. That's when I decided I would bring the language back.

With Global Warming, we do what we must do every season. We take action. On the Spring Equinox, we go to Harney Peak Rock and we welcome the Thunder back. In April we go to a place in a canyon of the Black Hills where we have an altar. We go and we

wipe the tears of relatives who are grieving and mourning. We pray for all creation that is grieving so when the spring comes, they will be ready to go embrace life again. The next step is in May when we do a ceremony with the Stone Nation. We take stones from there to the Devil's Tower and use them in the Sun Dance. When you do these things, you become closer to Creator. I am not a Medicine Man but I have been Sundancing over 30 years and I practice what I believe, what I can. Even if it's just you, dance! Some years ago, I saw the biggest flock of birds over my backyard in the sky. They were all hawks. Different colors, different sizes but all hawks. I talked to a Medicine Man who told me, "Yes, our Grandfather says that you are lucky if you witness a gathering of Nations. Every species will do this from time to time to renew relations among themselves. We people of all colors and Nations have the hardest time doing that. We are the only species that are dangerous. We need to review our relations among ourselves."

People helped me in my life. My mother died when I was 4 years old. My father died when I was 16. That's what Mitakuye Oyasin means–all my relations. Every part of creation is related.

At the Sun Dance, I was told if a Medicine Man runs the Sun Dance, people will transfer to him the responsibility to tell other Lakota people there how to be a Lakota. Each Lakota person has to find their own way to what it means to be Lakota.

When I come to a tree, I say, "Thank you." The tree says, "Come back." Creation is waiting for us. A retired forest ranger once accompanied me to a summer institute ceremony. Afterward, the ranger left a note saying "I'm glad I am not crazy. For thirty-something years, I've talked to the trees and the animals." We are so bound by regulations and policies that we cannot communicate freely with Creation. If we are going to save the Earth, we need to communicate with Creation. Open up, go back to Creation. Talk to them. It is the only way we can save our Grandmother, to be attached. Don't wait. We can't wait any longer. It's good to be free and communicate with your relatives.

"Our shellfish and fish are dying. The acidity comes from the change in conditions on the ocean floor. Off San Diego, methane is being released from the ocean floor. The acidic nature of the shift is killing the shellfish."

"Many people do not want to believe climate change is real, even as other people are dying because of it. We need to figure out what to do and we need to start now." *Terry Williams*

Terry Williams,
Commissioner of Fish & Wildlife for the Tulalip Tribes

Terry Williams of the Tulalip Tribe is Commissioner of Fish & Wildlife for the Tulalip Tribes and widely known for his leadership in natural resource and environmental management and for working to increase tribal sovereignty through tribal environmental regulatory and programmatic development.

"A good portion of our country does not believe climate change exists. It is clear that helpful federal legislation cannot be expected. To survive, Tribes must do something quickly. There is no sign of laws coming to protect the things that support Tribal culture – the ability to gather plants, to hunt and fish to interact with the landscape in a way that allows the relationship with the Creator to occur.

Some government agencies have come to the Tribes asking what to do. They know the Tulalip have been in the Northwest since before the glaciers there melted. The Tulalip knowledge must be captured.

Some things that are important to the Tulalip are not going to be there anymore. Some plant species are already disappearing. Some fish species in inland water are changing. Animals are changing: beaver are going to places in Alaska where people have no names for them. Huge shifts in animal and plant species, and changes in water conditions will take place. How will a Tribal culture survive?

The Tribe cannot shift. It must stay within boundaries or lose everything that supports it. Then how can the Tribes hold onto the things that allow them to be who they are – in the Northwest, those things are canoes and the ability to fish and hunt.

The Tulalip Tribe did the first climate change model for Puget Sound, now known as the Salish Sea. There is a lot of recovery to do. The spring thaw is now happening as much as two months early, creating a sudden change in timing that salmon have adjusted to for 10,000 years. Now the salmon are getting pushed out into the estuary far too early. The salmon reach the brackish water too early; their bodies are not ready and they die. Hundreds of thousands to millions of salmon are being lost.

The Tulalip could not build their salmon hatchery just where the salmon were when they spawned, because that was off the reservation, so instead they "bent" the salmon's genetics: they kept only the fish that were closest to spawn upon arrival at the facility. Now the fish are timed to the facility. Perhaps this kind of bending can be done with plants as well. I discussed this question with a man from the Department of Agriculture and now the Department of Agriculture is starting to think this way, and it is the Tribe that is causing them to do it.

Water is a huge problem – it is disappearing fast. The ocean is disappearing, changing its chemical makeup, turning acidic, and becoming polluted. Shellfish and fish are dying. The acidity comes from the change in conditions on the ocean floor. Off San Diego, methane is being released from the ocean floor. The acidic nature of the shift is killing the shellfish. Dairy farms near the Tulalip were creating waste, polluting water, and killing fish. Now the waste is processed and used to create electricity. The solution lies in shifting impact and making it into recovery.

In Washington State, it is predicted that the population will double in the next 20 years. That means pollution-related problems will double. Government will not solve those problems, so people on the ground have to do it.

The Tulalip are working with the White House and federal agencies and individuals who want to make a difference. Many people do not want to believe climate change is real, even as other people are dying because of it. We need to figure out what to do and we need to start now."

A Special note on NASA and Bombing/Impacting the Moon

On October 9, 2009, NASA's Lunar Crater Observation and Sensing Satellite (LCROSS) created twin impacts as it crashed on the Moon's surface in a search for water ice. The satellite travelled 5.6 million miles during a 113-day mission that ended in the Cabeus crater, a permanently shadowed region near the Moon's South Pole. LCROSS was designed to collect and relay data from the impact and debris plume resulting from the launch vehicle's spent Centaur upper stage crashing into crater Cabeus. The LCROSS mission discovered a significant amount of water during this mission, and the presence of lunar ice fields uncovered by NASA's Moon mission suggested that the quantity of water on the Moon could be greater than expected. Scientists believe that this discovery opened a new chapter in our understanding of the Moon, and that finding water on the Moon is important for the future of space exploration, for discussions about potential colonies on the Moon, and for the study of the solar system.

The announcement by NASA just before the workshop in early October 2009 about the LCROSS bombing/impacting of the Moon to search for water created grave concern among many Native participants at the workshop and illustrates the importance of and need for increased information exchange and improved cultural awareness when scientists and indigenous peoples work together on issues of mutual concern. Apparently, there was not a strong awareness of the important cultural significance of the Moon to many indigenous peoples by the agency during the mission. While on the one hand, like many science agencies, NASA was conducting basic scientific research; on the other hand, most Native Americans historically have a special relationship with the Moon – and view it with the greatest respect and honor. The Moon is regarded as especially important because of its role in natural Earth cycles such as female reproductive cycles, oceanic tides, agriculture, ceremonies, etc. From the discussions at the

workshop, it became clear that there is a large education gap that needs to be addressed so that agencies such as NASA, states, and other non-Native entities can be better informed about cultural sensitivities of various activities regarding sacred places and components of the entire Earth system, including the Moon.

Throughout the workshop, participants provided some thoughtful comments regarding the bombing of the Moon and a number of these comments have been collected here to help underscore this need for improved communications among indigenous peoples and the scientific community.

- All tribes have a special relationship with the Moon and the Moon is held in the greatest of respect and honor.

- There is concern about NASA's bombing the Moon, because of the strong impacts on women and their reproductive cycles, the tides in the oceans, and other important cycles that may be aggravated by bombing.

- The Moon has rights and does not belong to the US – who determines the right for countries to carry out activities on the Moon?

- Although NASA is funding both Earth and space research, we feel that there is a need to direct more efforts toward our Earth sciences and, in particular, climate change.

- There is a wish that scientists seek less invasive scientific investigations to collect data on lunar phenomena.

WORKSHOP AGENDA

Wednesday, November 18, 2009 **Theme: Setting The Stage** ***Convener: Pat Spears – President, Intertribal COUP***		
10:00 am –11:00 am		**Registration**
11:00 am – 12:00 pm	Exhibits Open	**Light Lunch**
12:00 pm – 1:00 pm		**Opening Ceremonies** **Invocation** **Welcome Song:** Midnite Express **Welcome** **Dr. Nancy Maynard –** *NASA Tribal College & University Program* **Carrie Billy –** *President/CEO American Indian Higher Education Consortium (AIHEC)*
1:00 pm - 1:30 pm		**The Road to Mystic Lake:** **The 1998 Inaugural Workshop and the Albuquerque Declaration** **Pat Spears & Bob Gough -** *Intertribal Council On Utility Policy (COUP)* **Dr. Nancy Maynard –** *NASA Tribal College & University Program*
1:30 pm – 4:30 pm		**Concurrent Sessions**
ISSUE AREA 1		**WATER RESOURCES, FOOD SOURCES & PROTECTION OF HABITAT**
		1:30-2:30 Climate Change and Water Resources in Indian Country **Frank Ettawageshik** – *United Tribes of Michigan,* **Vernon Masayesva** - *Black Mesa Trust*, **Gary Collins** - *Indigenous Waters Network*, TCU Facilitator
		2:30-3:30 **Envisioning Sustainable Ecosystems: Buffalo and Salmon Restoration** **Dr. Ed Valandra** – *American Indian Studies, USD,* **Susan Masten** - *Women Empowering Women for Indian Nations (WEWIN) and National Center for American Indian Enterprise Development,* TCU Faclitator
		3:30-4:30 Indigenous Agriculture **Vicki Karhu** - *Msvkoke Food Sovereignty Initiative,* **Diane Wilson** - *Dream of Wild Health,* TCU Facilitator
ISSSUE AREA 2		**SUSTAINABLE COMMUNITY DEVELOPMENT**
		1:30-2:30 Housing and Sustainable Infrastructure **Hazel James & Roberto Nutlious** - *Indigenous Community Enterprises (ICE),* **Bill Schumacher** – *COUP/Sustainable, Affordable and Efficient (SAFE) Homes,* TCU Facilitator
		2:30 - 3:30: The Process of Building Resilient Local Economies and Jobs **Nick Tilsen & Scott Moore** -*Thunder Valley Community Development,* **Anna Frazier & Erma Long** – *Dine' CARE, Navajo Green Jobs Coalition***,** TCU Facilitator**,**

		3:30-4:30 Gaming and Economic Development **Margaret Stevens & Roger Fraqua** – *National Indian Gaming Association (NIGA)*
ISSUE AREA 3		**CLEAN ENERGY**
		1:30-2:30 Solar Energy **Henry Red Cloud** – *Lakota Solar Enterprises*, **Gerardo Ruiz** - *Solar Leasing Options*, **Debbie Tewa**, Renewable *and Tribal Energy Coordinator, Arizona Dept. of Commerce,* TCU Facilitator,
		2:30-3:30 Wind Energy **Moderators:** TCU Facilitator, **Pat Spears** - *Intertribal Wind Development*, **Camille Greene** - *Sisseton-Wahpeton Community Wind Project,* **Nellis Kennedy** - *Honor the Earth*
		3:30-4:30 Transportation **Connie Fredenberg** - *TDX Corporation, St. Paul Island Electric Vehicle Project,* **Representative** - *SMSC Biodiesel Project,* TCU Facilitator
ISSUE AREA 4		**EDUCATIONAL RESOURCES**
		1:30-2:30 Computer Instruction **Christopher Philipp** - *Immersive Visualization (3DE),* TCU Facilitator
		2:30-3:30 Special Educational/Outreach Initiatives **Carolyn Jacobs** - *WGBH Teachers' Domain*; **Doug Herman** – *National Museum of the America Indian,* TCU Facilitator
		3:30-4:30 Training, Externships & Curricula **Bull Bennett** – *North Dakota Association of Tribal Colleges* **Dr. Nancy Maynard –** *NASA Tribal College & University Program* **Al Kuslikis** – *AIHEC,* TCU Facilitator
4:30 pm – 4:45pm		**Shakopee Mdewakanton Sioux Community (SMSC) Sustainable Projects** **Tour Presentation and Sign-ups for Community Tours - Stan Ellison -** *SMSC Land Office*
4:45 pm - 6:00 pm		**Tribal Colleges and Universities Poster Exhibits**
6:00 pm		**Dinner/Blessing/Remarks: Albert White Hat,** *Professor Emeritus, Lakota Studies, SGU* **Keynote Address: Captain Eugene Brower**, *President, Whaling Captains Association*

Thursday, November 19, 2009 Theme: Strategies and Solutions

Convener: Dr. Daniel Wildcat – Director, Haskell Environmental Research Studies Center

8:30 am –8:45 am		**Welcome and Opening Prayer**
8:45 am – 9:00 am	Exhibits Open	**Announcements**
9:00 am – 9:30 am		**State of the Science on Climate Change** **The U.S. National Assessment** **Tom Karl –** *National Oceanic and Atmospheric Administration (NASA)*
9:30 am-10:30 am		**Indigenous Perspectives: Confronting Climate Change in Indian Country** **Alan Parker** *–Northwest Indian Applied Research Institute (NIARI) - The Climate Change and Pacific Rim Indigenous Nations Project: What has been done?* *http://academic.evergreen.edu/g/grossmaz/climate.html* **Terry Williams** *– Commissioner of Fish & Wildlife for the Tulalip Tribes: What remains to do?* **Kandi Mossett** *- IEN Campus Climate Challenge Coordinator: Issues in organizing around the climate challenge at Tribal Colleges & Universities*
10:30 am – 10:45 am		**Break**
10:45 am – 11:15 am		**Keynote: Dr. Daniel Wildcat -** ***Director of the Haskell Environmental Research Studies Center*** **Tribal Colleges and Universities: Lessons Learned From the Past Decade And Models For Curriculum Development**
11:15 am – 12:00 pm		**Open Discussion with Above Panel, Keynote & Attendees:** **How Can Tribal Colleges & Universities Contribute to A Climate Change Research Agenda?**
12:00 pm – 1:15 pm		**Luncheon: Blessing & Remarks: Dr. Henrietta Mann -** *President, Cheyenne & Arapaho Tribal College*
1:15 pm – 2:30pm		**Panel Discussion: Securing Healthy Food, Clean Energy & Sustainable Housing** **Ted Skenadore** *-Tsyunhehkwa Agricultural, Oneida Tribe of Wisconsin* **Debby Tewa-** *Renewable and Tribal Energy Coordinator, Arizona Dept. of Commerce* **Hazel James** *- Indigenous Community Enterprises (ICE)*
2:30 pm – 3:00pm		**Break**
3:00 pm – 5:30 pm		**Geographic Regional Breakout Sessions** 1. ***What are the current stresses and concerns in tribal lands across the country?*** 2. ***How might climate variability and change impact these stresses?***
		Alaska/Coastal/Maritime/ Islands | **Great Lakes/ Northeast** | **Great Plains** | **Southwest/California/ Great Basin**
6 : 0 0 p m		**Dinner/Blessing /Remarks: Chief Arvol Looking Horse –** *19th Generation Keeper of the Sacred White Buffalo Calf Woman Chanupa* **Keynote Speaker: Billy Frank –** *Chairman, Northwest Indian Fish Commission* **Tribal Colleges and Universities Videos**

Friday, November 20, 2009 Theme: From Conventional To Resilience

Convener: Winona LaDuke – Executive Director, Honor The Earth

8:30 am –8:40 am		**Welcome and Opening Prayer**
8:45 am – 10:15 am	Exhibits Open	**Plenary Discussion: The Need to Shift Away From Conventional Centralized Energy and Towards the Development of Green Economics.** **Anna Frazier** - *Dine' CARE* **Erma Long -** *Citizen Against Ruining the Environment (Dine' CARE)* **Gail Small** - *Native Action, Coal and Coal Bed Methane* **Manny Pino** - *Director of American Indian Studies, SCC, Uranium Issues* **Kandi Mossett** - *IEN, Tar Sands, Refineries and Pipelines* **Faith Gemmill** - *RedOIL, The Frontlines of Alaskan Oil Issues*
10:15 am – 10:30 am		**Break**
10:30 am - 11:00 am		**Keynote Address: Winona LaDuke –** *Executive Director, Honor the Earth* **Reaffirming Our Affinity to the Land**
11:00 am – 11:45 am		**Open Discussion with Above Panel, Keynote & Attendees:** **How can Tribal Colleges and Universities Contribute to Building Resilient Tribal Communities?**
11:45 am – 12:00 pm		**Break**
12:00 pm – 1:15 pm		**Luncheon Blessing: Katsi Cook –** *Woman is the First Environment* **Luncheon Speaker: Nick Tilsen** – *Thunder Valley Community Development* **Planning A Healthy & Sustainable Community**
1:15 pm – 2:45 pm		**Panel: Securing Healthy Food, Clean Energy and Sustainable Housing** ***Clayton Brascoupe -*** *Traditional Native American Farmers Association* ***Michael Connolly*** *- Laguna Resource Services Inc., Utility Scale Wind Development* ***Pat Spears*** *- Intertribal COUP, Straw Bale SAFE Homes*
2:45 pm – 3:00 pm		**Break**
3:00 pm – 4:15 pm		***Breakout Sessions By Issue*** ***3. What kinds of coping options and adaptation strategies are available?*** ***4. What is needed in your region to implement these coping and adaptation strategies?*** **Breakout Session Topics**

Clean Energy	**Housing and Sustainable**	**Education & Training**	**Water Resources/Food**

		Clean Energy	Housing and Sustainable Community Development	Education & Training	Water Resources/Food Production/Sacred Sites, Habitat
4:15 pm – 4:30 pm		**Break**			
4:30 pm – 5:30 pm		**Presentation of Draft Mystic Lake Accord for Review and Approval** **Panel Presentation: On the Red Road to Copenhagen** **Tom Goldtooth** - *Executive Director, Indigenous Environmental Network,* **Frank Ettawageshik** - *Executive Director, United Tribes of Michigan,* **Dr. Debra Harry** - *Director of the Indigenous Peoples Council on Bio-colonialism and* **Dr. Anthony Socci** – *Senior Advisor on Climate and Energy, Office of International Affairs, Environmental Protection Agency*			
5:30 pm		**Adjourn**			
6:30 pm		**Reception**			
7:00 pm– 9:00 pm		**Bunky Echo Hawk Art Performance**			

Saturday, November 21, 2009 **Theme: Moving Forward** ***Convener: Dr. Daniel Wildcat – Director, Haskell Environmental Research Studies Center***	
8:00 am –9:00 am	**Special Presentation by WGBH & "Teachers Domain"** **Video & Other Digital Media Support** **Carolyn Jacobs** - *WGBH Teachers' Domain* **Gus Claymore & Stan Holder** - *Bureau of Indian Education*
9::00 am – 10:15 am	**Opening Prayer: Oren Lyons** - *Faithkeeper of the Turtle Clan, Onondaga Council of Chiefs of the Haudenosaunee* **Strategies and Solutions Recommended from Geographic Breakout Sessions** Alaska/Coastal/Maritime/ Islands Great Lakes /Northeast Great Plains Southwest/ California/Great Basin
10:15 am – 10:30 am	**Break**
10:30 am – 11:15 am	**Strategies and Solutions Recommended from Key Issues Sessions** **Issue 1 Water Resources, Food Sources & Protection of Habitat** **Issue 2 Housing and Sustainable Community Development** **Issue 3 Clean Energy** **Issue 4 Educational Resources**
11:15 pm – 12:00 pm	**Keynote Speaker: Oren Lyons –** *Faithkeeper of the Turtle Clan, Onondaga Council of Chiefs of the Haudenosaunee* **The Mystic Lake Accord and Future of Climate Change in Indian Country** **Closing Ceremonies** **Traveling Song: Midnite Express**
12:00 pm – 1:00 pm	**Lunch**

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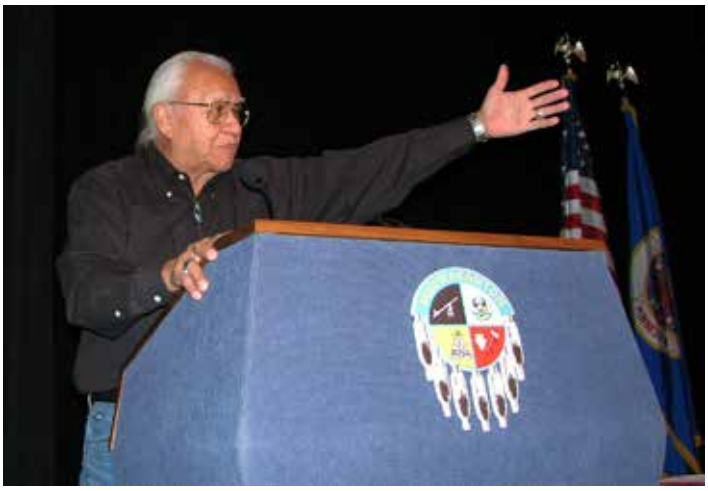
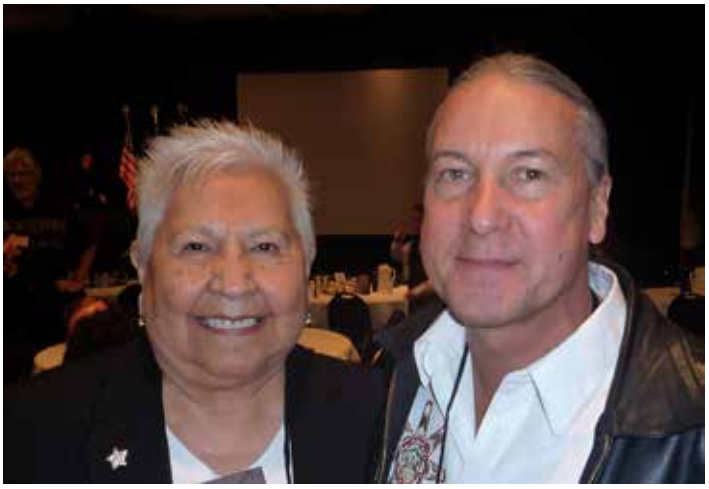
Photographs






SAVE THE DATE
Native Peoples Native Homelands
Climate Change Workshop II
Indigenous Perspectives and Solutions
"LET US PUT OUR MINDS TOGETHER AND SEE WHAT WE CAN CREATE FOR OUR CHILDREN."
- SITTING BULL
Mystic Lake Casino Hotel Prior Lake, Minnesota
On the homelands of the Shakopee Mdewakanton Sioux Community
November 18-21, 2009
Co-Chairs: Dr. Dan Wildcat (Haskell Indian Nations University)
& Winona LaDuke (Honor the Earth)
NASA
For more information or to register: www. nativepeoplesnativehomelands.org

THE MYSTIC LAKE DECLARATION

From the Native Peoples Native Homelands Climate Change Workshop II: Indigenous Perspectives and Solutions

At Mystic Lake on the Homelands of the Shakopee
Mdewakanton Sioux Community, Prior Lake, Minnesota
November 21, 2009

As community members, youth and elders, spiritual and traditional leaders, Native organizations and supporters of our Indigenous Nations, we have gathered on November 18-21, 2009 at Mystic Lake in the traditional homelands of the Shakopee Mdewakanton Dakota Oyate. This Second Native Peoples Native Homelands Climate Workshop builds upon the Albuquerque Declaration and work done at the 1998 Native Peoples Native Homelands Climate Change Workshop held in Albuquerque, New Mexico. We choose to work together to fulfill our sacred duties, listening to the teachings of our elders and the voices of our youth, to act wisely to carry out our responsibilities to enhance the health and respect the sacredness of Mother Earth, and to demand Climate Justice now.

We acknowledge that to deal effectively with global climate change and global warming issues all sovereigns must work together to adapt and take action on real solutions that will ensure our collective existence. We hereby declare, affirm, and assert our inalienable rights as well as responsibilities as members of sovereign Native Nations. In doing so, we expect to be active participants with full representation in United States and international legally binding treaty agreements regarding climate, energy, biodiversity, food sovereignty, water and sustainable development policies affecting our peoples and our respective Homelands on Turtle Island (North America) and Pacific Islands.

We are of the Earth. The Earth is the source of life to be protected, not merely a resource to be exploited. Our ancestors' remains lie within her. Water is her lifeblood. We are dependent upon her for our shelter and our sustenance. Our lifeways are the original "green economies." We have our place and our responsibilities within Creation's sacred order. We feel the sustaining joy as things occur in harmony. We feel the pain of disharmony when we witness the dishonor of the natural order of Creation and the degradation of Mother Earth and her companion Moon.

We need to stop the disturbance of the sacred sites on Mother Earth so that she may heal and restore the balance in Creation. We ask the world community to join with the Indigenous Peoples to pray on summer solstice for the healing of all the sacred sites on Mother Earth. The well-being of the natural environment predicts the physical, mental, emotional and spiritual longevity of our Peoples and the Circle of Life. Mother Earth's health and that of our Indigenous Peoples are intrinsically intertwined. Unless our homelands are in a state of good health our Peoples will not be truly healthy. This inseparable relationship must be respected for the sake of our future generations. In this Declaration, we invite humanity to join with us to improve our collective human behavior so that we may develop a more sustainable world – a world where the inextricable relationship of biological, and environmental diversity, and cultural diversity is affirmed and protected.

We have the power and responsibility to change. We can preserve, protect, and fulfill our sacred duties to live with respect in this wonderful Creation. However, we can also forget our responsibilities, disrespect Creation, cause disharmony and imperil our future and the future of others.

At Mystic Lake, we reviewed the reports of indigenous science, traditional knowledge and cultural scholarship in cooperation with non-native scientists and scholars. We shared our fears, concerns and insights. If current trends continue, native trees will no longer find habitable locations in our forests, fish will no longer find their streams livable, and humanity will find their homelands flooded or drought-stricken due to the changing weather. Our Native Nations have already disproportionately suffered the negative compounding effects of global warming and a changing climate.

The United States and other industrialized countries have an addiction to the high consumption of energy. Mother Earth and her natural resources cannot sustain the consumption and production needs of this modern industrialized society and its dominant economic paradigm, which places value on the rapid economic growth, the quest for corporate and individual accumulation of wealth, and a race to exploit natural resources. The non-regenerative production system creates too much waste and toxic pollutions. We recognize the need for the United States and other industrialized countries to focus on new economies, governed by the absolute limits and boundaries of ecological sustainability, the carrying capacities of the Mother Earth, a more equitable sharing of global and local resources, encouragement and support of self sustaining communities, and respect and support for the rights of Mother Earth and her companion Moon.

In recognizing the root causes of climate change, participants call upon the industrialized countries and the world to work towards decreasing dependency on fossil fuels. We call for a moratorium on all new exploration for oil, gas, coal and uranium as a first step towards the full phase-out of fossil fuels, without nuclear power, with a just transition to sustainable jobs, energy and environment. We take this position and make this recommendation based on our concern over the disproportionate social, cultural, spiritual, environmental and climate impacts on Indigenous Peoples, who are the first and the worst affected by the disruption of intact habitats, and the least responsible for such impacts.

Indigenous peoples must call for the most stringent and binding emission reduction targets. Carbon emissions for developed countries must be reduced by no less than 40%, preferably 49% below 1990 levels by 2020 and 95% by 2050. We call for national and global actions to stabilize CO2 concentrations below 350 parts per million (ppm) and limiting temperature increases to below 1.5^{o}c.

We challenge climate mitigation solutions to abandon false solutions to climate change that negatively impact Indigenous Peoples' rights, lands, air, oceans, forests, territories and waters. These include nuclear energy, large-scale dams, geo-engineering techniques, clean coal technologies, carbon capture and sequestration, bio-fuels, tree plantations, and international market-based mechanisms such as carbon trading and offsets, the Clean Development Mechanisms and Flexible Mechanisms under the Kyoto Protocol and forest offsets. The only real offsets are those renewable energy developments that actually displace fossil fuel-generated energy. We recommend the United States sign on to the Kyoto Protocol and to the United Nations Declaration of the Rights of Indigenous Peoples.

We are concerned with how international carbon markets set up a framework for dealing with greenhouse gases that secure the property rights of heavy Northern fossil fuel users over the world's carbon-absorbing capacity while creating new opportunities for corporate profit through trade. The system starts by translating existing pollution into a tradable commodity, the rights to which are allocated in accordance with a limit set by States or intergovernmental agencies. In establishing property rights over the world's carbon dump, the largest number of rights is granted (mostly for free) to those who have been most responsible for pollution in the first place. At UN COP15, the conservation of forests is being brought into a property right issue concerning trees and carbon. With some indigenous communities it is difficult and sometimes impossible to reconcile with traditional spiritual

beliefs the participation in climate mitigation that commodifies the sacredness of air (carbon), trees and life. Climate change mitigation and sustainable forest management must be based on different mindsets with full respect for nature, and not solely on market-based mechanisms.

We recognize the link between climate change and food security that affects Indigenous traditional food systems. We declare our Native Nations and our communities, waters, air, forests, oceans, sea ice, traditional lands and territories to be "Food Sovereignty Areas," defined and directed by Indigenous Peoples according to our customary laws, free from extractive industries, unsustainable energy development, deforestation, and free from using food crops and agricultural lands for large scale bio-fuels.

We encourage our communities to exchange information related to the sustainable and regenerative use of land, water, sea ice, traditional agriculture, forest management, ancestral seeds, food plants, animals and medicines that are essential in developing climate change adaptation and mitigation strategies, and will restore our food sovereignty, food independence, and strengthen our Indigenous families and Native Nations.

We reject the assertion of intellectual property rights over the genetic resources and traditional knowledge of Indigenous peoples which results in the alienation and commodification of those things that are sacred and essential to our lives and cultures. We reject industrial modes of food production that promote the use of chemical substances, genetically engineered seeds and organisms. Therefore, we affirm our right to possess, control, protect and pass on the indigenous seeds, medicinal plants, traditional knowledge originating from our lands and territories for the benefit of our future generations.

We can make changes in our lives and actions as individuals and as Nations that will lessen our contribution to the problems. In order for reality to shift, in order for solutions to major problems to be found and realized, we must transition away from the patterns of an industrialized mindset, thought and behavior that created those problems. It is time to exercise desperately needed Indigenous ingenuity – Indigenuity – inspired by our ancient intergenerational knowledge and wisdom given to us by our natural relatives.

We recognize and support the position of the International Indigenous Peoples Forum on Climate Change (IIPFCC), operating as the Indigenous Caucus within the United Nations Framework Convention on Climate Change (UNFCCC), that is requesting language within the overarching principles of the outcomes of the Copenhagen UNFCCC 15th Session of the Conference of the Parties (COP15) and beyond Copenhagen, that would ensure respect for the knowledge and rights of indigenous peoples, including their rights to lands, territories, forests and resources to ensure their full and effective participation including free, prior and informed consent. It is crucial that the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) is entered into all appropriate negotiating texts for it is recognized as the minimum international standard for the protection of rights, survival, protection and well-being of Indigenous Peoples, particularly with regard to health, subsistence, sustainable housing and infrastructure, and clean energy development.

As Native Nations and Indigenous Peoples living within the occupied territories of the United States, we acknowledge with concern, the refusal of the United States to support negotiating text that would recognize applicable universal human rights instruments and agreements, including the UNDRIP, and further safeguard principles that would ensure their full and effective participation including free, prior and informed consent. We will do everything humanly possible by exercising our sovereign government-to-government relationship with the U.S. to seek justice on this issue.

Our Indian languages are encoded with accumulated ecological knowledge and wisdom that extends back through oral history to the beginning of time. Our ancestors created land and water relationship systems premised upon the understanding that all life forms are relatives – not resources. We understand that we as human beings have a sacred and ceremonial responsibility to care for and maintain, through our original instructions, the health and well-being of all life within our traditional territories and Native Homelands.

We will encourage our leadership and assume our role in supporting a just transition into a green economy, freeing ourselves from dependence on a carbon-based fossil fuel economy. This transition will be based upon development of an indigenous agricultural economy comprised of traditional food systems, sustainable buildings and infrastructure, clean energy and energy efficiency, and natural resource management systems based upon indigenous science and traditional knowledge. We are committed to development of economic systems that enable life-enhancement as a core component. We thus dedicate ourselves to the restoration of true wealth for all Peoples. In keeping with our traditional knowledge, this wealth is based not on monetary riches but rather on healthy relationships, relationships with each other, and relationships with all of the other natural elements and beings of creation.

In order to provide leadership in the development of green economies of life-enhancement, we must end the chronic underfunding of our Native educational institutions and ensure adequate funding sources are maintained. We recognize the important role of our Native K-12 schools and tribal colleges and universities that serve as education and training centers that can influence and nurture a much needed Indigenuity towards understanding climate change, nurturing clean renewable energy technologies, seeking solutions and building sustainable communities. The world needs to understand that the Earth is a living female organism – our Mother and our Grandmother. We are kin. As such, she needs to be loved and protected. We need to give back what we take from her in respectful mutuality. We need to walk gently. These Original Instructions are the natural spiritual laws, which are supreme. Science can urgently work with traditional knowledge keepers to restore the health and well-being of our Mother and Grandmother Earth.

As we conclude this meeting we, the participating spiritual and traditional leaders, members and supporters of our Indigenous Nations, declare our intention to continue to fulfill our sacred responsibilities, to redouble our efforts to enable sustainable life-enhancing economies, to walk gently on our Mother Earth, and to demand that we be a part of the decision-making and negotiations that impact our inherent and treaty-defined rights. Achievement of this vision for the future, guided by our traditional knowledge and teachings, will benefit all Peoples on the Earth.

Approved by Acclamation and Individual Sign-ons.

Native Peoples - Native Homelands
Climate Change Workshop II

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