

**Shifting Seasons: Building Tribal Capacity for Climate
Change Adaptation Summit
Final Report**

College of Menominee Nation – Sustainable Development Institute

1. Executive Summary

College of Menominee Nation Sustainable Development Institute has a twofold mission: to reflect upon, rediscover, and strengthen the interconnected dimensions of Menominee sustainable development; and to disseminate and advance the tenets of sustainability of what is learned, known, and valued of the Menominee approach to sustainability to those who wish to share this knowledge and wisdom.

The 2014 Shifting Seasons: Building Tribal Capacity for Climate Change Adaptation Summit took place October 14 – 17, 2014 to address sustainability in relation to climate variability. The primary purpose of the summit was to bring together tribal decision makers, federal agencies, Indigenous practitioners, land resource managers and climate change scientists in order to share knowledge and resources to benefit tribal and non-tribal entities for climate change adaptation, specifically in the Northeast Region of the United States.

There were 140 participants at the Summit representing perspectives from academia, government, federal agencies, and tribal entities, and included tribal decision makers, natural resource managers, and climate change scientists. Overall participant attendance was about 50% tribal and 50% non-tribal.

The Summit included a community forest tour, facilitated events for students, presentations on various climate change impacts and adaptation strategies and climate science overviews, case studies, an eco-café, and breakout sessions. During the summit, participants were invited to participate in interviews facilitated by CMNSDI and were used to gather feedback regarding climate change, climate change adaptation, and thoughts regarding collaboration and partnerships. The following recommendations for moving forward come from an analysis of participant surveys, interviews and group report outs during the Summit:

1. Centralized Road mapping. There needs to be a single roadmap, clearing house or map Tribes can go to that will help steer them through the many different options and standards.
2. Flexible Funding. Funders need to consider Tribes as diverse constituencies that can use funds in a number of different ways.
3. Matchmaking. Liaisons are needed that can complement the work of a central coordinator for each Tribe in cutting through much of the clutter, and make connections for partnerships where there is a high chance that meaningful collaboration is possible.
4. General and local scope. Tribes need to identify general issues they can work on together and then determine how more local work can be facilitated.
5. Ethical interactions. Non-Tribal partners often have little experience working with Tribes. Tribal knowledge systems have the capacity to structure and lead scientific research in addition to the more commonly recognized role of complimenting scientific research.
6. Indigenous knowledge. Partnerships need to recognize the multi-faceted role of Indigenous knowledge systems, from story and ceremony to traditional ecological knowledge to Indigenous languages prominent role in any climate change program because of the power of their long term perspectives and wisdom.
7. Educate and Train. Tribes capacity to work well on climate change depends on whether there is information to persuade Tribal leaders that climate change is among the key issues they should focus on. It also involves educating Tribal members about climate change issues in a way that makes sense for their own perspectives on their lives and behaviors.
8. Centralized Networks. Existing and future Indigenous networks need to work together.
9. Tribal Colleges & Universities. Increase their capacity to serve as facilitators of climate change projects for the benefit of Tribal communities.

2. Introduction

The Summit

The College of Menominee Nation Sustainable Development Institute has a two-fold mission: to reflect upon, rediscover, and strengthen the interconnected dimensions of Menominee sustainable development and to disseminate and advance the tenets of sustainability of what is learned, known, and valued of the Menominee approach to sustainability to those who wish to share this knowledge and wisdom. In accordance with this mission, SDI has a long history connecting Indigenous scientists, Tribal leaders and members of Indigenous peoples to engage in dialogue on and partner together to address environmental and sustainability issues that impact their communities, cultural ways of life, and economies (Dockry et al. 2015), as well as, connecting Indigenous peoples with scientists and professionals representing universities and nonprofit, U.S. and state agencies and institutions from around the world.

College of Menominee Nation Sustainable Development Institute organized the “Shifting Seasons: Building Tribal Capacity for Climate Change Adaptation Summit” which took place October 14 – 17, 2014 in Keshena, Wisconsin. The primary purpose of the summit was to bring together tribal decision makers, federal agencies, Indigenous practitioners, land resource managers and climate change scientists in order to share knowledge and resources that will benefit tribal and non-tribal entities for climate change adaptation, specifically in the Northeast Region of the United States.

The 2014 Shifting Seasons Summit was collaboration among College of Menominee Nation Sustainable Development Institute, Northern Arizona University’s Institute for Tribal Environmental Professionals, and Michigan State University. Funding was provided by Department of the Interior Bureau of Indian Affairs Climate Change Program, Northeast Climate Science Center, and the Great Lakes Integrated Sciences and Assessment Center.

This report provides an overview of the meeting structure, methods for encouraging dialogue and gathering input, and the tools and techniques used to process and analyze the information gathered. The report concludes by outlining a research, education, and technical assistance program agenda based on input and recommendations from the summit as well as video interviews from summit participants.

There were 140 participants at the Summit. Participants represented perspectives from academia, government, federal agencies, and tribal entities, and included tribal decision makers, natural resource managers, and climate change scientists. Overall attendance was about 50% tribal and 50% non-tribal.

The Summit featured pre-events on October 14, which included forest field visits and facilitated events for students. The main summit days were organized by offering participants presentations on various climate change adaptation strategies and climate change impact and climate science overviews, case studies, an eco-café, and breakout sessions. The eco café featured 12 different tables staffed by various academic, government, environmental, and climate change stakeholders and was formatted to create ideas for ways that tribes can work collaboratively with a number of federal, state, and non-profit climate change initiatives. During the summit, participants were invited to participate in interviews. The interviews were facilitated by the College of Menominee Nation Sustainable Development Institute and were used to gather feedback from participants regarding climate change, climate change adaptation, and thoughts regarding collaboration and partnerships.

The following recommendations for moving forward come from an analysis of participant surveys, interviews and group report outs during the Summit:

1. Centralized Road mapping. There needs to be a single roadmap, clearing house or map Tribes can go to that will help steer them through the many different options and standards.
2. Flexible Funding. Funders need to consider Tribes as diverse constituencies that can use funds in a number of different ways.
3. Matchmaking. Liaisons are needed that can complement the work of a central coordinator for each Tribe in cutting through much of the clutter, and make connections for partnerships where there is a high chance that meaningful collaboration is possible.
4. General (Global) and local scope. Tribes need to identify general issues they can work on together and then determine how more local work can be facilitated.
5. Ethical interactions. Non-Tribal partners often have little experience working with Tribes. Tribal knowledge systems have the capacity to structure and lead scientific research in addition to the more commonly recognized role of complimenting scientific research.
6. Indigenous knowledge. Partnerships need to recognize the multi-faceted role of Indigenous knowledge systems, from story and ceremony to traditional ecological knowledge to Indigenous languages prominent role in any climate change program because of the power of their long term perspectives and wisdom.
7. Educate and Train. Tribes capacity to work well on climate change depends on whether there is information to persuade Tribal leaders that climate change is among the key issues they should focus on. It also involves educating Tribal members about climate change issues in a way that makes sense for their own perspectives on their lives and behaviors.
8. Centralized Networks. Existing and future Indigenous networks need to work together.
9. Tribal Colleges & Universities. Increase their capacity to serve as facilitators of climate change projects for the benefit of Tribal communities.

Background/Program Overview

The central theme of the 2014 Shifting Seasons summit was building tribal capacity for climate change adaptation. Much of the dialogue related to climate change in the context of Tribes and the U.S. focuses on scientific trends and data; however, with a need for on the ground Tribal climate change adaptation planning, this summit was designed with the purpose of providing information and resources for Tribal nations to build capacities to plan for climate change. Indigenous peoples everywhere are seeing the effects of climate change and how it is already impacting land, culture, livelihoods (plants, animals, and human), and other areas. A major factor in considering the assembly of this summit was the input received from previous Shifting Seasons summits where participants emphasized the need to prepare for and adapt to climate change.

The summit included pre-summit events, presentations on various climate change adaptation strategies and climate change impacts, climate science overviews, case studies, an eco-café, and breakout sessions. Participants also partook in interviews. The summit intended to gather a diversity of perspectives, acknowledging traditional wisdom, allowing tribal representatives and government organizations an outlet to share knowledge, and bringing federal resources to tribes.

On Tuesday, October 14, a community forest tour was hosted by CMNSDI as an opportunity to not only introduce participants to the Menominee Nation and the area, but also consider the question of how Tribal Colleges and Universities (TCU's) can work together to address local climate change challenges? Specifically, how to develop local resources as the means to address climate change research issues? The community forestry tour was framed by the community dimensions of life in the SDI theoretical model of sustainability, and explored through an ongoing project being led by CMNSDI, in collaboration with Menominee Tribal Enterprises, Smithsonian Institute, and Michigan State University Native American Institute.

On Wednesday, October 15, the opening speakers gave an overview of climate change impacts, tribal adaptation, and applying climate science. By beginning the summit with these presentations, participants were prepared to think about climate change trends and modeling. The intent was to help prepare participants for open dialogue with one another to share knowledge and resources for climate change adaptation. Following this, case studies were presented to highlight and contrast different planning adaptation cases and emphasized processes, successes, and planning struggles.

Wednesday's Eco Café included 12 tables, each composed of a different representation from respective climate science centers, forestry programs, climate hubs, academia, government agencies, tribal environmental professionals, climate risk management teams, and climate change impact teams. This format allowed summit participants to gather information and form relationships with representatives for climate change adaptation. Some of the considerations tables focused on were what the table was representing, how specific groups should collaborate with tribes, how partnerships can be effective, how to work with tribes on adaptation, how to better serve and support tribes, what resources different agencies have, and other adaptation and climate change collaboration issues. The eco café served to meet a pre-conference goal of providing agencies a glimpse into what it may be like to work with tribes. Wednesday evening's Menominee Logging Camp and Cultural Museum tour and dinner were intended to showcase the Menominee Indian Tribe of Wisconsin's logging history, rich traditions and practices, and serve as a social and cultural event for summit participants.

On Thursday, October 16, a plenary address covered the topic of bringing together diverse knowledge to create opportunities for engagement, adaptation and policy making, and a case study on adaptation planning followed.

These subjects correlated with breakout sessions that took place on Thursday and Friday. Breakout sessions focused on climate change adaptation training, vulnerability assessments, ethics for tribal and non-tribal collaborations, and forest management.

On Friday, October 17, facilitated conversations took place that were intended to address questions on what solutions are for addressing tribal adaptation needs, how all agencies and initiatives can fit together in relation to tribes, what the role of non-profit organizations is, and what recommendations are for various networks and organizations. Efforts were made in breakout sessions and facilitated conversations to include tribal and non-tribal speakers and perspectives.

3. Perceptions of Climate Change Impacts in the Northeast

*“Climate change is here and it’s affecting our Mother Earth”
-Laurie Boivin, Menominee Tribal Legislature Chairperson*

American Indian and Alaska Native tribes interact with and adapt to the changing environment, and have been doing so for thousands of years. Native resilience is inherent in cultural understandings of place and time. Climate change is an opportunity to apply Indigenous knowledge to adapt and sustain native communities. The College of Menominee Nation Sustainable Development Institute combines western research methods with indigenous knowledge to address climate change through a variety of research projects and outreach initiatives (Shifting Seasons 2011). Research has continued to gain momentum on the impacts Tribes have already seen from climate change, and proposed responses to address these impacts (Bennett et al 2014).

The Interviewees

The summit included diverse attendees of diverse backgrounds. On the whole, over 41 people were interviewed that reflected the demographic and professional profile of the Summit.

Impacts of Climate Change

*“The question is not whether or not we will see a significant impact,
it’s to what degree will we see that change.”
-Anonymous Interviewee*

*“I thought it was just environmental, but now it’s opened my eyes....
I thought it was just one thing, but apparently, it’s really tribal-wide
how it affects things. All culture, everything.
We do have our work cut out for us. I’m glad I got picked to come here.”
-Anonymous Interviewee*

Climate change has wide reaching impacts for the participants of the summit. While organizations such as the Great Lakes Integrated Sciences and Assessments Center have produced profiles for the region based on historic trends and the results of models (http://glisa.umich.edu/media/files/GLISA_climate_change_summary.pdf), people’s own experiences express important insights about what they feel climate change impacts are in the local contexts in which they live, work, and play. In interviews during the summit, participants identified the following areas of concern for the places in which they live. For all of these areas of concern, it will be important for scientific organizations to support people in these local contexts to better characterize and understand these changes, why they may be perceived to be happening, and what can be expected in the future.

Transportation

- Changes in water levels will make Great Lakes ports/channels harder to enter for shippers.
- More extreme weather events such as hurricanes or tornadoes will encumber shippers.
- Road issues such as potholes and washout will be amplified.

Fish Habitat and Fisheries

- Cold water fish like trout will have a harder time surviving in warmer waters.

- Depending on the area, whitefish and walleye will struggle to survive on their own.
- Increased frequency of hurricanes, tornados and floods will impact fisheries and fish habitat.

Precipitation

- Total annual precipitation is increasing, on average.
- Great Lakes water levels are decreasing long-term, with large short-term variations probable.
- Higher temperatures, increased evaporation lead to lower water levels in creek beds and swamps.

Food Supply

- Higher temperatures, longer growing season will likely increase crop yield, through mid-century.
- Impacts on important connections in food supply chains.
- Moose populations have migrated north for a cooler climate.

Health - both mental and physical

- Increased storm activity and flooding will increase watershed and fish contamination.

Seasons changing

- Changes in seasonal patterns could lead to earlier winters that are colder and more extreme.
- Significant droughts could develop because of increasing temperatures and evaporation rates.
- By 2050, temperatures projected to increase by 1.8 to 5.4 F
- Higher temperatures will lead to increased precipitation in the form of rain, and less of snow.

Pollution

- Greenhouse gas emissions often accompanied with air pollutants, resulting in hazy conditions.

Trees

- Drought brought on by climate change can adversely affect maple tree health.
- Drought brought on by climate change can adversely affect birch trees.
- Less healthy maple trees reduces their ability to make maple sugar.

Insects

- Warmer, more humid conditions are more conducive to an increase in mosquito populations.
- Warmer, more humid conditions are more conducive to an increase in tick populations.

Plants

- More growth of aquatic plants - Algal blooms? Warmer surface water conditions, combined with nutrients in runoff lead to toxic algal blooms.
- Climate change results in plants relocating to their preferred environment. Relocation of plant and human communities
- Wild rice is threatened by invasive species. More competitive and adaptive plants threaten wild rice habitats.

The meaning of climate change

The interviews also included questions on the meaning of climate change and potential solutions. These questions are important for understanding the different perspectives of the participants and provide insights into what kinds of dialogue need to be established for people to understand each other. We will discuss some themes that arise from an analysis by SDI staff and Summit planning partners. SDI hopes to code these interviews and provide a

more detailed analysis that will be disseminated to the participants through our project website: Collaboration in Action.

What does climate change mean?

The respondents had many different understandings of what climate change means. Different themes stood out across various sets of responses. Some of the more common themes are the following:

- (1) Climate change is an earth systems scale issue that can be described in terms of physical relationships at this scale.
- (2) Climate change is an issue of natural versus non-natural and what is happening now is not natural.
- (3) Climate change refers to a situation we are in today where our morals in relation to plants, animals and environment are out of balance or disrupted in some way.
- (4) Historically, climate change referred to systems that operated gradually and slowly, but today climate change is a “fast” issue, climate destabilization is happening too fast for human adaptation.
- (5) Climate change is primarily something that individual humans perceive in their daily lives and they can tell the difference between weather and climate.
- (6) Climate change is primarily an issue in the *places* where people live and that matter to them as their homelands.
- (7) Climate change means something different depending on what language you use to describe it.
- (8) Climate change is a matter of understanding threats and opportunities and how to understand the costs and benefits of different risks and responses.

What should be done about climate change?

In response to this question, most participants only discussed mitigation as the natural response to climate change. But mitigation was assumed to mean different things. Some people associated mitigation with large nation states coming to an agreement on curtailing emissions. Others associated mitigation as more of an issue of individual personal responsibility. Yet others associated mitigation with economic actors like corporations’ learning to minimize their greed and power over politics and individual behavior. Importantly, some people expressed Tribes as major players in politics, economics, and as influencers of personal behavior. Whereas others either omitted reference to Tribes or cited Tribes directly as being ineffective and non-influential in mitigation. Some people did not discuss mitigation and discussed responding to climate change primarily as a matter of adaptation. Some people described adaptation as what we need to do because mitigation has failed. Others discussed adaptation without referencing mitigation. One person mentioned geo-engineering.

4. Federal, State, Academic and Non-Profit Group Climate Change Initiatives and Indigenous Climate Networks

In the previous 2011 Summit hosted by CMN SDI, participants identified a need to develop and work on networks and partnerships available to Tribes to assist in addressing climate change issues. The 2014 Summit included broad representation that demonstrated a host of networks and partnerships, some facilitated by CMNSDI, and others overlapping from existing partnerships.

4.1 Department of the Interior Climate Science Centers

The DOI Climate Science Centers (CSCs) provide scientific information, tools, and techniques that land, water, wildlife, and cultural resource managers and other interested parties can use to anticipate, monitor, and adapt to climate change impacts. Much of the information and tools provided by the CSCs, including physical and biological research, ecological forecasting, and multi-scale modeling, is in response to landscape-level priority needs identified by the Landscape Conservation Cooperatives (LCCs), as well as the cross-sector needs of other agencies and communities in each region.

There is tremendous opportunity for tribes to benefit from these scientific resources, and contribute to the overall knowledge base on climate change with an indigenous perspective. Tribes may consider drawing from their own Traditional Ecological Knowledge to use in conjunction with these resources and/or share with the CSC consortiums.

Website: <http://www.doi.gov/csc/index.cfm>

4.2 Pennsylvania State University led Sustainable Climate Risk Management (SCRiM)

Centered at [Penn State](#), SCRiM links a transdisciplinary team of scholars at 19 universities and 5 research institutions across 6 nations to answer the question, “What are sustainable, scientifically sound, technologically feasible, economically efficient, and ethically defensible climate risk management strategies?”

For Shifting Seasons, SCRiM explored how SCRiM methods and tools can be used to support Tribal decision-making. What are Robust Decision Making (RDM) and Values-Informed Mental Models (VIMM)? What opportunities for education and outreach does SCRiM provide? How can you get involved?

Website: <http://scrimhub.org/>

4.3 Northern Institute of Applied Climate Science (NIACS)

The Northern Institute of Applied Climate Science (NIACS) has been designed as a collaborative effort among the Forest Service, universities, and forest industry to provide information on managing forests for climate change adaptation, enhanced carbon sequestration, and sustainable production of bioenergy and materials. NIACS works with natural resource professionals and forest owners to integrate climate change into their work. We work with National Forests, federal agencies (such as NPS and BIA), state agencies, local governments, tribes, conservation organizations, and individual family forest owners. In the Eastern region, there are two hubs covering the Midwest and Northeast.

Website: <http://www.nrs.fs.fed.us/niacs/>

4.4. USDA Climate Hubs

The USDA Climate Hubs mission is to develop and deliver science-based, region-specific information and technologies to agricultural and natural resource managers that enable climate-smart decision-making and provide assistance to enable land managers to implement those decisions.

The focus of the Climate Hubs is less on developing science, and more about technology transfer, providing information, tools and practices to farmers and forest owners to assist them in achieving their climate-specific goals.

Website: <http://climatehubs.oce.usda.gov/>

4.5 University of Wisconsin-Extension

Through the University of Wisconsin-Extension, all Wisconsin people can access university resources and engage in lifelong learning, wherever they live and work.

Fundamental to this mission are UW-Extension's partnerships with the 26 UW campuses, the county and tribal governments, and other public and private organizations. Fulfilling the promise of the [Wisconsin Idea](#), UW-Extension extends the boundaries of the university to the boundaries of the state and helps the university establish mutually beneficial connections with all its stakeholders.

Topics discussed at the Shifting Seasons Summit involving the UW-Extension's capabilities include university backed, shared evidence-based educational model at the local level on: Climate science, adaptation and carbon mitigation; How the local community can realize their own goals using systems thinking; Community sustainability promoted differently in each county and three tribal offices

Website: <http://www.uwex.edu/>

4.6 EcoAdapt

EcoAdapt, founded by a team of some of the earliest adaptation thinkers and practitioners in the field, has one goal - creating a robust future in the face of climate change. We bring together diverse players to reshape planning and management in response to rapid climate change. Our main objectives include: Building the field of adaptation by coordinating, magnifying, and making climate change adaptation capacity and resources more accessible; Building capacity of current and future professionals in planning and management across sectors so they can engage in climate change adaptation; Supporting implementation of adaptation strategies by providing capacity to partners eager to take climate adaptation action.

Website: <http://www.ecoadapt.org/>

4.7 U.S. EPA - Climate Change Adaptation

The EPA is taking a number of common-sense steps to address the challenge of climate change, including the following: Collecting emissions data; Getting reductions; Evaluation policies, options, costs, and benefits; Advancing the science; Partnering internationally; Partnering with states, localities, and tribes; Helping communities adapt.

Climate ready tools include: Climate Ready Water Utilities (CREAT tool), WaterSense, Source Water Protection, Tribal Climate Change Adaptation Waste Management Planning Tool, Disaster Debris Recovery database, Indoor Air Quality/Healthy Homes, and EJ Small grants (2015 RFA Community Climate Resiliency).

Website: <http://www.epa.gov/climatechange/>

4.9 National Climate Assessment

The National Climate Assessment: Engagement with Indigenous Communities. The Third National Climate Assessment (NCA), released in May 2014, highlighted the impacts of climate change occurring to Indigenous people, on and around tribal lands and resources. The NCA is a scientific document and does not make policy recommendations, but it is one of the key documents that policymakers turn to for formulating policies related to climate change and Indigenous communities should have their voices heard in this process. One of the recommendations included in the NCA 2013 sustained assessment report calls for support to ensure continued tribal engagement. There are opportunities for continued engagement in the sustained NCA process, for example:

- Individuals, tribes, organizations can join NCAnet (see link below) and decide on level of participation.
- 200+ technical inputs Vulnerability assessment, data collection, indicators, adaptation strategies
Need a mechanism to continue sustained tribal engagement
- The process for how to conduct a sustainability assessment is currently being worked on, so a great opportunity for the Indigenous community to be leaders in what a successful sustainability assessment could look like.

The Sustainable Development Institute would be happy to go over ideas with you to enhance effective inclusion of Indigenous peoples and Indigenous-related climate change impacts in the sustainability assessment.

Website: <http://nca2014.globalchange.gov/>

4.10 National Oceanic and Atmospheric Administration (NOAA)

Understanding climate variability and change to enhance society's ability to plan and respond

NOAA's website states, Americans' health, security, and economic well-being are tied to climate and weather. Every day, we see communities grappling with environmental challenges due to unusual or extreme events related to climate and weather. In 2011, the United States experienced a record high number (14) of climate- and weather-related disasters where overall costs reached or exceeded \$1 billion. Combined, these events claimed 670 lives, caused more than 6,000 injuries, and cost \$55 billion in damages. Businesses, policy leaders, resource managers, and citizens are increasingly asking for information to help them address such challenges.

NOAA provides science, data, and information that Americans want and need to understand how climate conditions are changing. Without NOAA's long-term climate observing, monitoring, research, and modeling capabilities we could not quantify where and how climate conditions have changed, nor could we predict where and how they are likely to change.

Website: <http://www.noaa.gov/climate.html>

4.11 Institute for Tribal Environmental Professionals (ITEP), Northern Arizona University

ITEP serves tribes through outstanding, culturally-relevant education and training that increase environmental capacity and strengthen sovereignty. Its programs include Climate Change, Air Quality, Waste Management, Environmental Education and Outreach, Tribal Clean Energy Resource Center. Over 20 years, ITEP has served almost all 566 tribes nationally. For climate change, ITEP engages in Climate Change Adaptation Planning, Webinars, a Tribal Climate Change Newsletter, its Tribes & Climate Change website, Tribal profiles (case studies), Fact Sheets, an Adaptation Planning Toolkit, Facilitating Adaptation Planning and Outreach.

Website: <http://www7.nau.edu/itep/main/ClimateChange/>

4.12 G-WOW

G-WOW is shorthand for “Gikinoo’wizhiwe Onji Waaban,” which means ‘Guiding for Tomorrow’ in Ojibwe. G-WOW is a partnership between Wisconsin Extension and the Great Lakes Indian Fish and Wildlife Commission. The G-WOW Climate Literacy Model seeks to understand climate change through its impact on the sustainability of key species that support cultural practices. G-WOW engages learners to fight climate change through service learning. G-WOW uses climate impacts on Ojibwe cultural practices as an indicator of how climate change affects people of all cultures. G-WOW also links place-based evidence & TEK with scientific climate research. G-Wow’s work seeks to be transferrable to other cultures & locations

Article about G-WOW: <http://www.wicci.wisc.edu/news-gwow.php>

4.13 Southeast Climate Science Center

The CSC seeks to create actionable science. That is, science that is relevant to government, tribes, businesses, and NGOs with potential to inform decisions and policy making. Actional science is ideally co-produced by scientists and decision-makers, it should be understandable, accessible, and usable to meet the needs of stakeholders.

Examples of climate adaptation projects include designing refuges with sea level rise in mind, wildlife corridor connectivity for the Southeast, predicting response of herbivores on urban trees under climate change, a handbook for managers to understand and use sea level rise models for ecosystem management, Identification of sensitive ecosystems to help prioritize current efforts and plan future research and monitoring, and implications of mangrove migration under climate change

Website: <https://www.doi.gov/csc/southeast/>

4.14 Climate Solutions University/Model Forest Policy Program

CSU is a program founded by Nancy Gilliam and Gwen Griffith to address the impacts of climate change on forest, water and economic resources, with a focus on rural communities because this is where the vital natural resources are and where capacity is lacking to conduct climate planning. The CSU program today is a multi-year distance learning program designed to bring climate resilience at the community level through a four step climate adaptation process. We first go through a planning process, then following thru with a multi-year implementation support network and program. The planning process starts with the foundation of team engagement to guide the process, then we guide them through an educational process for climate risk assessment, identifying solutions, development and implementation of an adaptation plan. To date CSU has worked with 24 communities across the country from coast to coast, and Alaska. The local community leadership for the CSU process has ranged from watershed organizations to local government to local federal agencies.

Website: <http://www.mfpp.org/csu/>

4.15 Wisconsin Initiative on Climate Change Impacts

WICCI is a collaboration of state, university, local, private and federal experts. It seeks to identify climate risks to the natural and built environment and develop and support adaptation strategies. WICCI disseminates outcomes through a broad stakeholder network. Outcomes include the 2011 state-wide climate change assessment, outreach

to decision makers and resource managers, sponsored research into climate impacts and adaptation, a robust distributed network of scientists and stakeholders. Resources for Tribes include locally relevant climate projections, and impacts and adaptation strategies for natural resources, including forestry, sugaring, wild rice and fish and game.

Website: <http://www.wicci.wisc.edu/>

5. Indigenous Networks

Rising Voices 3 Workshop, Learning and Doing: Education and Adaptation through Diverse Ways of Knowing

The Rising Voices 3 workshop operated from the theme of Learning and Doing: Education and Adaptation through Diverse Ways of Knowing. The workshop was held at the National Center for Atmospheric Research (NCAR) in Boulder, Colorado from 29 June – 1 July, 2015. The workshops aim to facilitate cross-cultural approaches for adaptation solutions to climate variability and change with attendees from diverse perspectives and backgrounds including Indigenous leaders, Indigenous and non-Indigenous environmental experts, students, educators, scientific professionals, and more.

The Rising Voices 3 workshop drew from previous Rising Voices gatherings. Topics for Rising Voices 3 included:

- Scientific-Indigenous partnerships in support of in-situ adaptation and relocation in response to climate variability and change
- Education curricula and student engagement in support of youth and early-career leadership on climate issues, and
- Ways to further a more inclusive understanding of natural resources and ecosystem services impacted by climate change that emphasizes restorative justice and shifting from a language of ‘resources and services’ to one of ‘relations.’

Website: <http://risingvoices.ucar.edu/>

Indigenous Peoples Climate Change Work Group

Formed in 2006, the group has sought to develop education and research programs at tribal colleges and universities (TCUs) that are focused specifically on climate change. Originally called the Native American and Alaskan Native Working Group, participants recently changed the name to be more inclusive of Indigenous peoples worldwide. The overarching goals are to train those future generations of American Indians and Alaska Natives, earth science professionals, educators, scientists, engineers, and technologists to ensure that Indigenous tribal knowledges of landscapes and climates are valued, used, and incorporated into the tribal exercise of earth science education and research.

Facebook Page: https://www.facebook.com/Indigenous-Peoples-Climate-Change-Working-Group-205930409437836/photos_stream

First Stewards

The First Stewards, Inc. is best described by the mission and vision statement, as follows: First Stewards, Inc. seeks to unite indigenous voices to collaboratively advance adaptive climate change strategies to sustain and secure our cultures and strengthen America’s resiliency and ability to adapt to climate change by holding symposia, and cultivating sustainable projects and educational opportunities within indigenous communities.

To help achieve the mission, the founding Board of First Stewards, Inc. has been assembled with representatives from the following regions: 1) Pacific Islands; 2) West Coast; 3) Alaska; 4) Inland 5) Great Lakes 6) East Coast (currently vacant) and 7) Gulf of Mexico (currently vacant).

Website: <http://www.firststewards.org/>

Native Peoples Native Homelands

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 essential 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.

Facebook page: <https://www.facebook.com/Native-PeoplesNative-Homelands-Climate-Change-Workshop-2-166620372460/>

Climate and Traditional Knowledges Work Group

The Climate and Traditional Knowledges Workgroup (CTKW) is a group of indigenous persons, staff of indigenous governments and organizations, and experts with experience working with issues concerning traditional knowledges. The CTKW developed these Guidelines through a collaborative effort with funding support from individual tribal governments, the North Pacific Landscape Conservation Cooperative, the Northwest Climate Science Center and the USDA Forest Service Pacific Northwest Research Station. Guidelines for Considering Traditional Knowledges (TKs) in Climate Change Initiatives is a publication intended to be an informational resource for tribes, agencies, and organizations across the United States interested in understanding TKs in the context of climate change. The Third National Climate Assessment issued in May 2014 contained a chapter dedicated to the impact of climate change on tribal peoples. In light of the increasing recognition of the significance of traditional knowledges (TKs) in relation to climate change, a self-organized, informal group of indigenous persons, staff of indigenous governments and organizations, and experts with experience working with issues concerning traditional knowledges (The Climate and Traditional Knowledges Workgroup – CTKW), felt compelled to develop a framework to increase understanding of issues relating to access and protection of TKs in climate initiatives and interactions between holders of TKs and non-tribal partners. The Guidelines were originally developed to inform the Department of Interior’s Advisory Committee on Climate Change and Natural Resource Science (ACCCNRS) and the North Pacific Landscape Conservation Cooperative in May 2014. The CTKW developed these Guidelines through a collaborative effort with funding support from individual tribal

governments, the North Pacific Landscape Conservation Cooperative, the Northwest Climate Science Center and the USDA Forest Service Pacific Northwest Research Station.

Website: <https://climatetkw.wordpress.com/>

6. Recommendations

Participants engaged in a number of activities in which they recommended certain actions be taken to better connect Tribes with federal, state, academic, and nonprofit partners. Michigan State University (MSU) Professor of Philosophy, Dr. Kyle Whyte, facilitated a full day entirely devoted to a conversation circle on working ethically with Tribes, and a facilitated half-day brainstorm session based on participant experiences at the summit. The video interviews and eco-cafe session furnished many important recommendations as well. The following is a summary of the most powerful (commonly articulated) recommendations. Again, the purposes of the summit are (1) to provide climate change adaptation planning training that is suitable for both Tribes who are beginning to plan for climate change and those who are already far along; (2) to connect Tribes to climate change programs and research institutions; and (3) to provide “in-depth” education for employees of governmental and non-governmental organizations and scientists and scholars for partnering with Tribes on climate change initiatives.

Major Recommendations

(1) Centralized Road mapping: Tribes, federal and state agencies and programs, university researchers and nonprofit organizations all have very particular and often highly regional or local climate adaptation programs. Particularity and locality, while positive in some respects, is negative for many Tribes who want to take advantage of multiple adaptation planning support services and tools. Each program has different funding standards, funding packages and deadlines, protocols, and personnel (with diverse levels of experiences working with Tribes), among many other dimensions of differentiation and diversity. There needs to be a single roadmap, clearing house or map Tribes can go to that will help steer them through the many different options and standards. The recommendation supports Tribes by helping them avoid time intensive learning of multiple protocols and standards. This will especially require federal agencies to come to an agreement about how their diverse programs fit together as a unified climate change adaptation service for Tribes.

(2) Flexible Funding: Funding programs should be more flexible in terms of providing options that would fit with Tribal capacities for securing and applying for funds. Funding options should include funding for individual Tribes such as 638 funds and funds that particular Tribal departments can apply for; funds for intertribal projects; funds that are flexible enough for Tribes to focus on climate change explicitly or to fold climate change into other focus areas in which climate change is a major dimension (e.g. public health, education, housing, etc.); deadlines that can be adjusted depending on each Tribes particular planning needs, bureaucratic capacities; funds that can be used either for capacity building or for advancing on capacities already built. Funders need to consider Tribes as diverse constituencies that can use funds in a number of different ways. Pool resources.

(3) Matchmaking: Tribes should designate a central coordinator as a reference for all of their climate change work partners from outside the Tribe. This “coordinator,” which for some Tribes is played by the emerging sustainability coordinator jobs, can help steer particular partners to appropriate Tribal agencies, staff and groups of Tribal citizens. The coordinator will also be able to sift through potential options that are likely not to be viable. Federal Tribal climate change liaisons such as those in the BIA should serve as matchmakers. They should endeavor to learn about what all Tribes are doing regarding climate change in their regions, what Tribes’ needs are and what capacities Tribes have for taking on different funding projects. These liaisons can then compliment the work of a central coordinator for each Tribe in cutting through much of the clutter, and make connections for partnerships where there is a high chance that meaningful collaboration is possible. Nonprofit organizations can fill in gaps (and lobby, since Tribes can’t when receiving federal funds) in coordination that federal liaisons or

Tribal coordinators cannot fill, similar to how organizations such as the United South and Eastern Tribes have done so on other issues and are emerging in this role for climate change adaptation. Nonprofits should not add to the burden of negotiating complex and numerous programs, but should take leadership to lessen the burden. These people can help Tribes distinguish good from bad funds. Break down silos. Having internal liaisons from Tribes.

(4) General (Global) and local: Climate adaptation services are often times so locally focused as to ignore that climate change is an issue where global trends affect what happens locally. Climate change is closely tied to human collective actions that emit fossil fuels into the atmosphere and the slow programs humans have made in reducing their emissions. Tribes need to identify general issues they can work on together and then determine how more local work can be facilitated.

(5) Ethical interactions: Non-Tribal partners often have little experience working with Tribes. The following points were made about what non-Tribal partners should consider when seeking to work with Tribes in ways that are ethical. Here, ethical refers to ensuring that Tribes are treated in ways that avoid harms that other communities do not experience. Non-Tribal partners should consider the following as pointers: (A) Tribal knowledges such as Traditional Ecological Knowledge are not only an issue in terms of Tribal sharing; Tribes also have needs to maintain their own internal knowledge sharing practices to support their own independence. Non-Tribal partners must always consider that Tribes have their own knowledge needs that far exceed non-Tribal interests for knowledge exchange. (B) While laws and policies for collaboration are talked about as “government-to-government” or “federal trust relationship” to Tribal sovereigns, collaboration ultimately comes down to individuals developing mutual trust, respect and learning. Non-Tribal partners must focus both on respecting formal collective requirements (e.g. the government-to-government relationship) but also attending to ongoing development and maintenance of personal relationships. This involves constantly attending to building trust, breaking down barriers and not placing the burden of learning on Tribes all the time. (C) NonTribal partners must consider that Tribes are not required to help them learn and that Tribes can choose whether in certain situations it is best to assert their sovereignty more adversarially (through lawyers, for example) or through more accommodating approaches that seek to educate nonTribal partners about Tribal cultural protocols, histories and views on sovereignty. In this sense, nonTribal partners have to respect Tribes’ prerogative to choose when to take care of themselves and when to engage in critical educational activities. (D) Indigenous knowledges cannot be seen as static or as observations alone, but as dynamic knowledge systems that operate at a number of levels, from the level of moral responsibility to the level of particular harvesting techniques and understanding of ecological relationships. Tribal knowledge systems have the capacity to structure and lead scientific research in addition to the more commonly recognized role of complimenting scientific research.

(6) Indigenous knowledge. Partnerships need to recognize the multi-faceted role of Indigenous knowledge systems, from story and ceremony to traditional ecological knowledge to Indigenous languages. Climate science must always respect the value of Indigenous knowledge. Climate change funds and programs have to provide flexibility and space for Tribes to integrate adaptation planning and tools with language and cultural programs and the traditional activities of Tribal members, from ceremony to subsistence and cultural harvesting. Elders need to have a prominent role in any climate change program because of the power of their long term perspectives and wisdom.

(7) Educate and Train. Tribes capacity to work well on climate change depends on whether there is information to persuade Tribal leaders that climate change is among the key issues they should focus on. It involves also educating Tribal members about climate change issues in a way that makes sense for their own perspectives on their lives and behaviors. This also involves addressing Tribal members who do not believe in climate change in productive ways (such as denying it as an issue altogether). Scientific approaches to climate change need to support Tribes in making the case to leaders, younger and older generations about climate change so that Tribes can make appropriate decisions about what efforts need to be put into adaptation planning. Agencies need to come to reservations more.

(8) Centralized Networks. The Indigenous networks need to work together.

(9) Tribal Colleges and Universities (TCU'S). Tribal Colleges and Universities working directly with and within tribal communities have a vested interest in helping their communities plan and implement activities that will assist in the development of culturally appropriate long-term adaptation and mitigation strategies. Opportunities that can be directed through the TCU's would increase Tribal community resiliency because the residual positives of a research project include participation by tribal students who may assume leadership positions within the Tribe in the future.

7. Lessons Learned and Conclusion

Video interviewees and summit attendees both responded to questions evaluating the summit that bear important lessons for future activities of this kind. There were a large amount of positive responses to the summit, though there was no formal evaluation used beyond asking people what they thought and how much they enjoyed or did not benefit from the different activities.

- (1) Some participants felt at different times that topics were either too driven by technical/scientific framing or utilized this framing too little.
- (2) Some participants felt that focusing on traditional knowledge distracted from some of the practical concerns Tribal governments must negotiate.
- (3) Some participants felt that while the summit tried to connect with Tribes at their precise level of planning (the Tribes were surveyed in advance), that there was not enough effort to make sure that different Tribes at similar levels really connected with each other and that there were case examples from all levels of planning.
- (4) Participants appreciated the tours and the dialogue and networking approach of the event and many reported learning a great deal owing to their personal interactions.

8. Concluding Thoughts

During 2014 there has been a growing list of accomplishments for Tribes in terms of planning and development of climate change initiatives at the federal and academic level. This has been due primarily to the work of indigenous scholars and tribal communities, but has also been assisted through collaborations and partnerships from federal agencies and academic institutions. But, there is still much work to be done.

The 2014 Shifting Seasons Summit has served as one opportunity to demonstrate the capability created by SDI to assist not only the Menominee community, but other tribal communities in addressing the challenges of identifying climate change impacts and developing culturally appropriate adaptation strategies . Based on the feedback generated from the 2014 Summit SDI is looking to utilize this as the impetus to continue development of its capabilities, but also to begin to assist other Tribal Colleges/Universities, Tribal Communities, Federal Agencies, Academic Institutions, and Non-Profit Groups, to collaborate on opportunities to share resources and knowledge for addressing this global and common issue of shifting seasons and the impact on ways of life.

Whether we see specific climate change impacts in our individual areas or not, we still have an opportunity to make positive changes in our shared Earth as we determine how we and our future generations will live within our environment for years to come.

The College of Menominee Nation Sustainable Development Institute would like to extend our heartfelt thanks to all of the people within each organization that assisted and made this event possible.

Maec Waewaenan Ketaenen

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10. Appendices

A.1 – Complete List of Participant Comments (Online)

A.2 – Shifting Seasons Summit Agenda (Online)

A.3 – Facilitated Discussion Question Sheets (Online)