Tribal Resilience in the Face of Climate Change: SAFE Homes and Distributed Generation

National Council on Science and Environment
Green Economy Conference
Washington DC Jan 22, 2009

INTERTRIBAL Council On Utility Policy

Tribes Building Sustainable Homeland Economies
P.O. Box 25, Rosebud, SD 57570
IntertribalCOUP.org

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**WINTER EXTREMES**

<table>
<thead>
<tr>
<th>TITLE: Battiste Good</th>
<th>NAME OF YEAR: Deep snow and tops of lodges only visible winter.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE: 1722-1723</td>
<td>(35 of 192)</td>
</tr>
</tbody>
</table>

**COLLECTOR'S NOTE:**
The spots are intended for snow (Mallery 1893:297).

<table>
<thead>
<tr>
<th>Previous Year</th>
<th>Next Year</th>
<th>Next in Search Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous Count</td>
<td>Next Count</td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>TITLE: Battiste Good</th>
<th>NAME OF YEAR: Eat frozen fish winter.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE: 1749-1749</td>
<td>(61 of 192)</td>
</tr>
</tbody>
</table>

**COLLECTOR'S NOTE:**
They discovered large numbers of fish frozen in the ice, and subsisted on them all winter (Mallery 1883:302).

<table>
<thead>
<tr>
<th>Previous Year</th>
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</table>

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Waniyetu Wówapi: Native American Records of Weather and Climate
Matthew D. Therrell, Makayla J. Trotter
Department of Geography and Environmental Resources, Southern Illinois University, USA

Abstract
Pictographic calendars called Waniyetu wówapi or ‘winter counts’ kept by several Great Plains Indian cultures (principally the Sioux or Lakota peoples) preserve a record of events important to these peoples from roughly the 17th through 19th centuries. A number of these memorable events include natural phenomena such as meteor storms, eclipses, and unusual weather and climate. Examination of a selection of the available winter count records and related interpretive writings indicates that the Lakota and other native Plains cultures recorded many instances of unusual weather or climate and associated impacts. Analysis of the winter count records in conjunction with observational and proxy climate records and other historical documentation suggests that the winter counts preserve a unique record of some of the most unusual and severe climate events of the early American period and provide valuable insight into the impacts upon people and their perceptions of such events in the ethnographically important region of the Great Plains.

© 2011 American Meteorological Society
“Entering the 21st century, a prime Native strategy encourages the development of sustainable homeland economies to ensure survival as Nations and for the restoration of a more balanced climate for Mother Earth. The Strategy includes the protection of naturally diverse ecosystems and the use of renewable energy technologies.”

Bob Gough, Secretary, Intertribal Council On Utility Policy

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Tribal Colleges and Wind Resources

- Climate/Natural Resource monitoring training/projects
- Meteorological Data Centers
- Wind Development Training courses for Reservation job creation and employment
- Wind Forecasting along the Windshed for value-add firm power sales into the market
TRIBAL WIND - FEDERAL HYDROPOWER:
Breaking the Positive Feedback Loop in the CO2 Energy Cycle

Drought and Reduced Mountain Snowpack

Excessive Rainfall and Flooding

Missouri River is at all time historical low-water level!

The present drought and precipitation shifts are consistent with changing climate scenarios associated with increased levels of CO2 from coal fired power plants -- the “New Normal”. While precipitation has shifted to the east, the infrastructure has not. Now, more water falls downstream of the dams, diminishing the hydropower available to WAPA.

TRIBAL WIND AND FEDERAL HYDROPOWER

The map below depicts Section 2606, which was selected by WAPA to study the potential integration of Tribal wind energy into the Federal Hydropower grid. WAPA authorized up to $1 Million in 2007 to conduct this feasibility study to integrate Wind and Hydropower throughout the Missouri River Basin. The Intertribal COUP proposed 20-25 Indian Reservation wind energy sites for inclusion in this study, which could potentially supply approximately 3,000 MWs of Wind Energy annually. This level of Tribal Wind Energy production could easily return the use of WAPA’s power grid to 50% clean renewable energy (i.e. wind and hydro power), thus reducing the dependency on coal burning power plants, and enable the Corps of Engineers to better manage the diminishing supply of fresh water for food production, recreation and human consumption.
Feasibility of Integrating Tribal Wind and Federal Hydropower
Native Peoples Native Homelands

Dammed Indians on the Missouri River

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Wind/Hydro Feasibility Study Area (Section 2606)
Includes Reservation Distributed Generation Sites

Section 2606 authorizes the expenditure of up to $1 million to conduct a wind/hydro feasibility study to evaluate the opportunities for wind/hydro integration throughout the Missouri River Basin to supply power to WAPA 3,000 MWs on 20 Reservations averaging 150 MWs per Reservation.
PREVAILING WIND DIRECTIONS

Wind/Hydro Feasibility Study Area (Section 2606)
Includes Reservation Distributed Generation Sites

COUP Proposed WAPA
Section 2606
Wind Study Sites
for 3,000 MWs of Tribal Wind Power

WIND DIRECTION AND FREQUENCY

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Coping and Adaptation Strategies for Native Peoples
Suggestions by Workshop Participants

What are Some Ways Tribal Colleges Can Contribute?

- **Enhance education** about science and technologies
  - General
  - Climate change – local impacts
- **Increase access** to scientific and technical expertise & data
- **Monitor ongoing changes** and improve projections of future changes for better planning & adaptation
- **Create partnerships** with government agencies, others
- **Promote and enable local land-use and natural resource planning** to better prepare and respond to climate changes.
- **Increase participation of Native Peoples** in regional and national discussions and decision-making
Issues Addressed

*Workshop focused on these issues across US geographic regions:*

- Water resources
- Food sources
- Protection of habitats, sacred sites/lands
- Sustainable ecosystems
- Sustainable housing and infrastructure
- Local/green economies & jobs
- Clean energy
  - Solar
  - Wind
- Transportation
- Education & training
  - Tribal College focus

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SUPPLEMENTAL WIND AND HYDRO POWER
INTEGRATION FEASIBILITY STUDY
UCAR Precipitation/Wind/Climate Study

Regional Climate Change Challenges:
- Biological Carbon Sequestration
- Climate Impacts on Agriculture and Grazing
- Fish and Wildlife Response to Climate Change
- Geological Carbon Sequestration
- Invasive Species and Wildland Fire
- Protection of Native American Cultural Resources
- Protection of Trust Species, including Migratory Waterfowl
- Renewable Energy
- Water Availability and Water Quality for Humans and Ecosystems
- Wildlife Disease
- Wildlife Recovery and Restoration
### Quick Guide to Some Key Climate Change Adaptation Activities

Compiled for NFWPCAS Steering Committee (Jan 27, 2011)

<table>
<thead>
<tr>
<th>ACTIVITY (weblink)</th>
<th>PURPOSE</th>
<th>PRODUCTS (due date)</th>
<th>LEAD</th>
<th>PARTICIPANTS</th>
<th>STATUS</th>
<th>CONNECTIONS TO NFWPCAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Fish Wildlife Plant Climate Adaptation Strategy (NFWPCAS)</td>
<td>Produce National Fish Wildlife and Plant Climate Adaptation Strategy involving govt and nongovt partners by 2012</td>
<td>Draft strategy (Oct 2011) Final strategy (May 2012)</td>
<td>USFWS NOAA States</td>
<td>Intergovernmental Steering Committee and many others</td>
<td>ongoing</td>
<td>Will include focus on climate impacts on ecosystems that can help inform NFWPCAS development</td>
</tr>
<tr>
<td>National Climate Assessment (NCA) <a href="http://www.globalchange.gov/what-we-do/assessment">http://www.globalchange.gov/what-we-do/assessment</a></td>
<td>Produce National Assessment of (1) impacts of climate change on US regions, sectors and (2) needs to address impacts</td>
<td>Draft NCA (July 2011?) Final NCA (2013)</td>
<td>USGCRP with broad-based Steering Committee</td>
<td>Govt and nongovt</td>
<td>ongoing</td>
<td></td>
</tr>
<tr>
<td>Interagency Climate Change Adaptation Task Force (ICCATF) <a href="http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation">http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation</a></td>
<td>Provide recommendations on fed govt actions to advance climate adaptation</td>
<td>Report to President called for variety of efforts including NFWPCAS, Water Adaptation Strategy, federal agency adaptation strategies</td>
<td>CEQ OSTP NOAA</td>
<td>Federal agencies</td>
<td>Ongoing</td>
<td>Called for NFWPCAS and use of “ecosystem-approaches to adaptation” as top principle of US adaptation efforts</td>
</tr>
<tr>
<td>National Ocean Council (NOC)</td>
<td>Established by President to lead efforts to advance/implement nation’s ocean policy efforts</td>
<td>Action plans to address 9 priority issues including “Strengthen resiliency and adaptation of coastal and ocean environments and communities”</td>
<td>CEQ</td>
<td>Federal agency council</td>
<td>Ongoing</td>
<td>Opportunity for collaboration on adaptation strategy for coastal and ocean resources</td>
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</tr>
<tr>
<td>US Global Climate Research Program (USGCRP) Adaptation Science Strategy</td>
<td>Develop strategy to advance science in support of climate adaptation</td>
<td>Adaptation Science Strategy</td>
<td>USGCRP</td>
<td>Govt and nongovt input</td>
<td>Ongoing</td>
<td>Opportunity to exchange information on key needs and solutions on adaptation science as part of NFWPCAS</td>
</tr>
</tbody>
</table>

**Region/State Scales**

| Landscape Conservation Cooperatives (LCCs) | Nation-wide network of LCCs established by DOI to provide venue for regional-scale assessment and understanding of climate impacts on natural resources and foster more integrated efforts to address them across govt and nongovt partners | Each LCC determining its products and services such as: Vulnerability Assessments Needs Assessments Capacity Building | USFWS | Each LCC has a steering committee of multiple organizations | Ongoing | LCCs could provide conduit for broad-based input on key issues and solutions to address them as core part of the NFWPCAS |
| Climate Science Centers (CSCs) | DOI: establishing network of Climate Science Centers (CSCs) to provide information and tools to support adaptation efforts of LCCs and many partners regarding natural resources (and other topics) | Key products determined by needs identified by LCCs and others | USGS | Multiple partners involved in Steering Committees for CSCs | Ongoing | Since CSCs have strong focus on impacts of climate on natural resources, they are key sources of input on priority science/decision support needs and strategies to address them for inclusion in NFWPCAS |
| National Climate Service/Regional Climate Centers (RCCs) | NOAA Climate Service is establishing nationwide network of “regional climate centers” to provide climate products and services to broad range of users, sectors | Many products and services from climate change projections at multiple scales to assessments and capacity building | NOAA | Multiple partners involved in RCC development | Ongoing | RCCs could provide information on key needs for climate products and services and strategies to address them re: natural resources and other sectors |
| State Adaptation Plans | Many States engaged in assessment of climate impacts and development/implementation of adaptation strategies | Variety of products including vulnerability assessments and adaptation plans | States | State agencies and non-govt partners at variety of levels (differs by State) | Ongoing | These are key sources of expertise and input for the NFWPCAS regarding what is working, priority needs and recommended strategies/solutions |
Native Peoples Native Homelands

Sustainable Affordable Efficient

SAFE Homes
Capital Cost + Operating Cost = Affordability
Mass + Insulation = Comfort

1. Energy
   - Reduce load and heating and cooling cost
   - Stretch energy assistance funding
   - Reduce imports of high cost materials

2. Employment & Economic Development
   - Create training & job opportunities
   - Create value added businesses

3. Health
   - Reduce in overcrowding
   - Reduce IEQ related medical expenses
   - Reduce absenteeism from work and school

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The Oldest and Newest Straw Bale Houses In South Dakota

Built in 2009 as part of the COUP/SGU Train the Trainers Program

Built in 1921 in southern Todd County, SD

... Both on the Rosebud Sioux Indian Reservation
Tribal Sustainability and Resilience
19th AND 21st CENTURY MODELS
Sustainable, Affordable, Future-Proofed and Efficient Homes

Building Resilient Communities on a Base of Energy Efficiency and Renewable Resources

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So …

“Let Us Put Our Minds Together and See What Life We Will Make for Our Children.”

Sitting Bull