Building Indigenous Sustainability Through Energy and Housing

NIDIS Drought Workshop

Rapid City - September 2014

INTERTRIBAL

COUP

Council On Utility Policy

Tribes Building Sustainable Homeland Economies

P.O. Box 25, Rosebud, SD 57570

IntertribalCOUP.org

Patrick Spears (1950-2012)

Intertribal COUP President Pat Spears speaking in Washington DC on Tribal Climate and Energy Issues.

Former Chairman, Lower Brule Sioux Tribe
President, Intertribal COUP
Co-Chair, Native Peoples/ Native Homelands
Contributor to the NCA Tribal Chapter

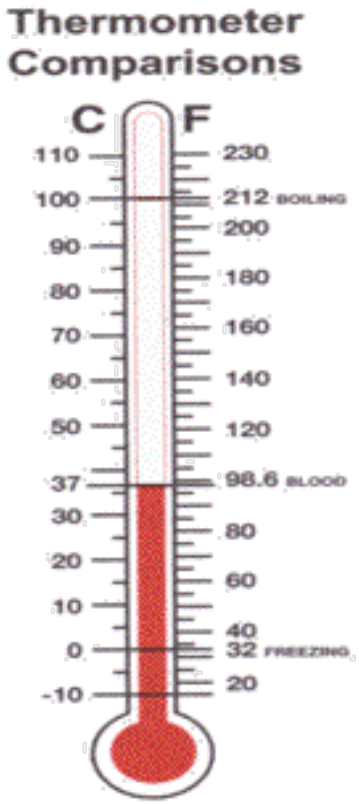
Pat's response upon hearing reports that the human contribution to global warming and climate change appeared to be reduced by increased solar activity and natural variation:

"Hau, that means

Crises In Indian Country:


CLIMATE
HEALTH
ENERGY
HOUSING
RESOURCES
UNEMPLOYMENT
POVERTY

CLIMATE CHANGE 101:
Almost all living beings on the Earth flourish where they do because of the daily, seasonal and annual range of temperature and humidity.

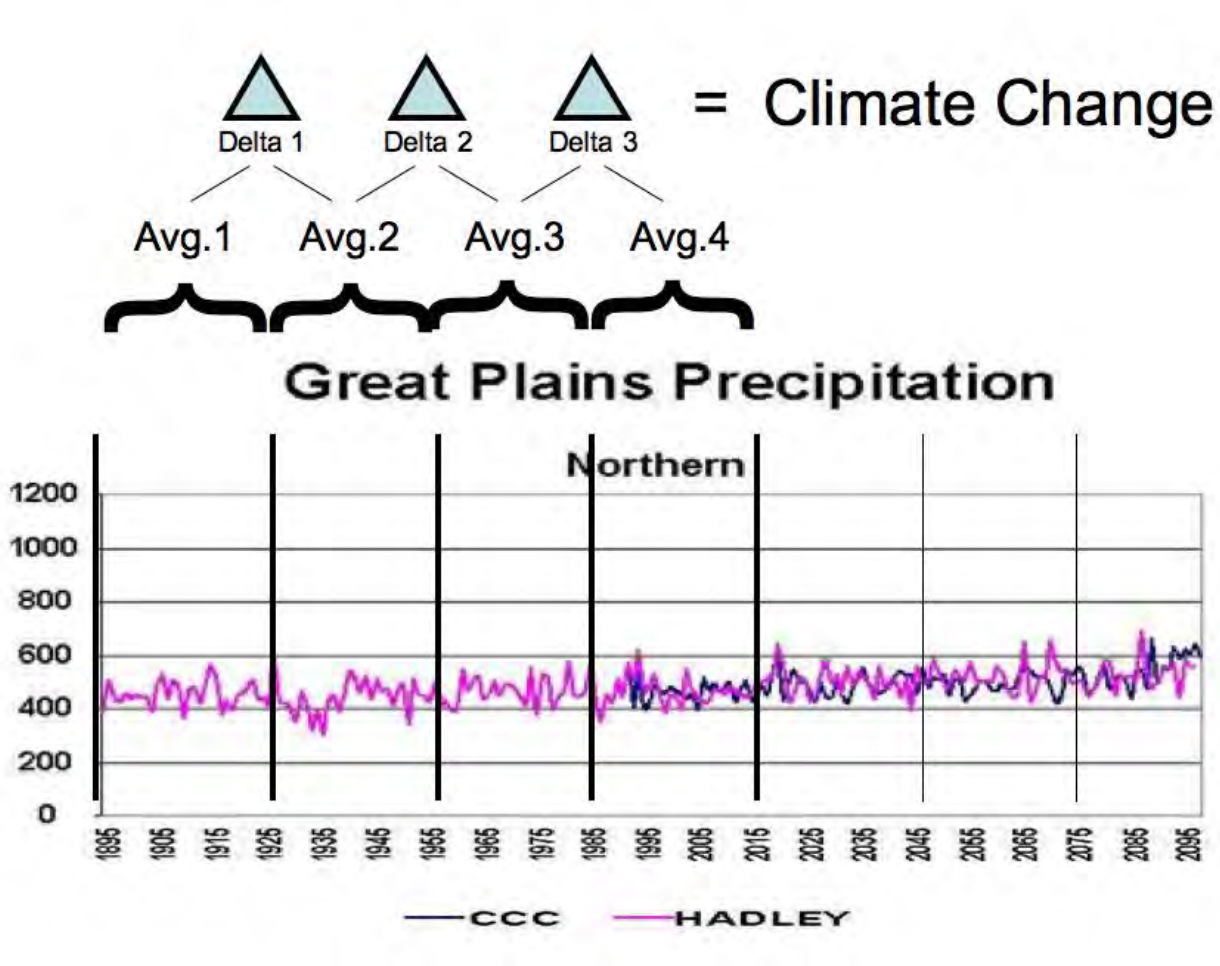


Temperature: How Hot and Cold?

Humidity: How Wet and Dry?

CLIMATE SCIENCE 201

Conclusions Abstracted from Comparative Weather Data

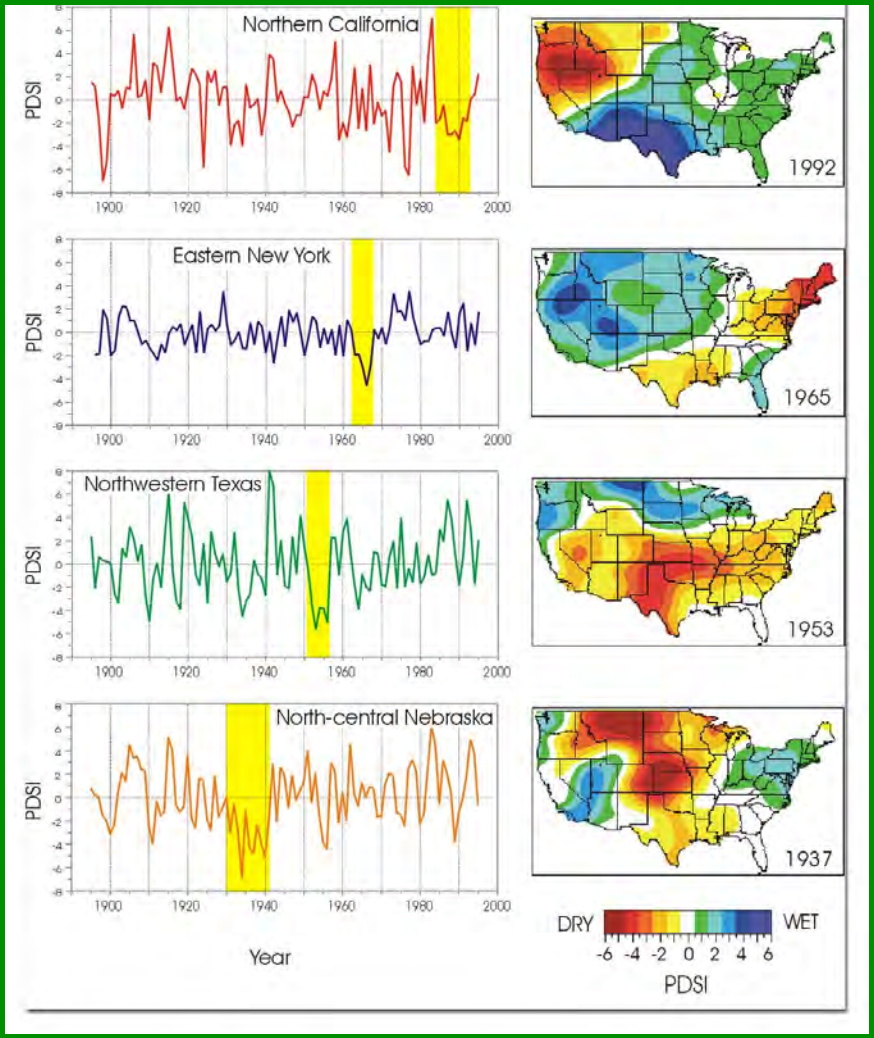


Climate Scientists And Policy Wonks Live Here

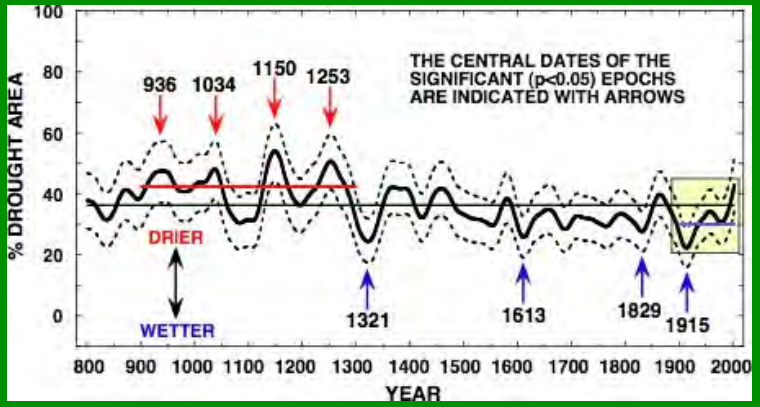
Most Real People Live Here

http://www.nrel.colostate.edu/projects/gpa/maps_results/precip_timeseries.jpg

100 Year Planning View



Long Term "Paleo" View



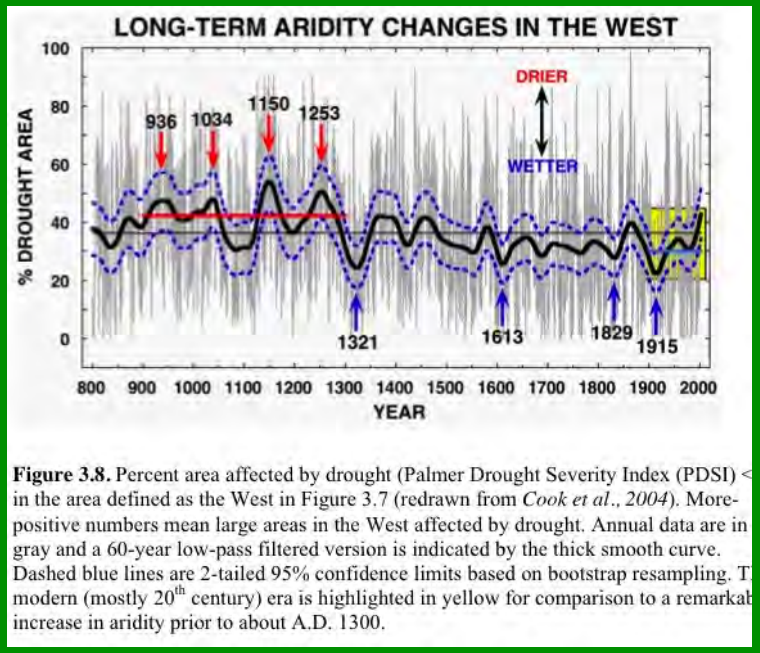


Figure 3.8. Percent area affected by drought (Palmer Drought Severity Index (PDSI) < in the area defined as the West in Figure 3.7 (redrawn from *Cook et al., 2004*). More-positive numbers mean large areas in the West affected by drought. Annual data are in gray and a 60-year low-pass filtered version is indicated by the thick smooth curve. Dashed blue lines are 2-tailed 95% confidence limits based on bootstrap resampling. T modern (mostly 20th century) era is highlighted in yellow for comparison to a remarkab increase in aridity prior to about A.D. 1300.

http://www.ncdc.noaa.gov/paleo/drought/images/temporal_spatial.jpg

Extreme Swings in Climate Cycles Could Jeopardize the Socioeconomic Stability in the Northern Great Plains Region

January 21, 2005

(GRAND FORKS, ND) -- Recently completed studies reconstructing the historical climatic trends for the last 2000 years in the northern Great Plains show that frequent alternating climatic cycles of drought and wet periods are typical for this area. These cycles could last more than 160 years, and future ones could be more severe than those on our very limited record books. The results of this study suggest that this region is likely to experience a significant drought within the next few decades. Without timely water management strategies, the drought conditions will limit the socioeconomic development of the region and may even threaten the sustainability of current living conditions.

"Our region is obviously in a wet cycle," said Ed Steadman, EERC Senior Research Advisor. "In spite of the devastating effect of reoccurring floods in recent history, a long-term drought will be far more catastrophic to our region," he said.

Groundwater resources in North Dakota were extensively depleted during the drought of the 1930s to offset the water shortage. For example, the Moorhead Aquifer dropped from 6 feet below ground level in 1913 to more than 190 feet below in 1948. Similarly, the West Fargo Aquifer system has declined dramatically as well. Aquifers in the Fargo area have decreased about 2 feet a year for the past 15 years.

Extreme Swings in Climate Cycles Could Jeopardize the Socioeconomic Stability in the Northern Great Plains Region

January 21, 2005

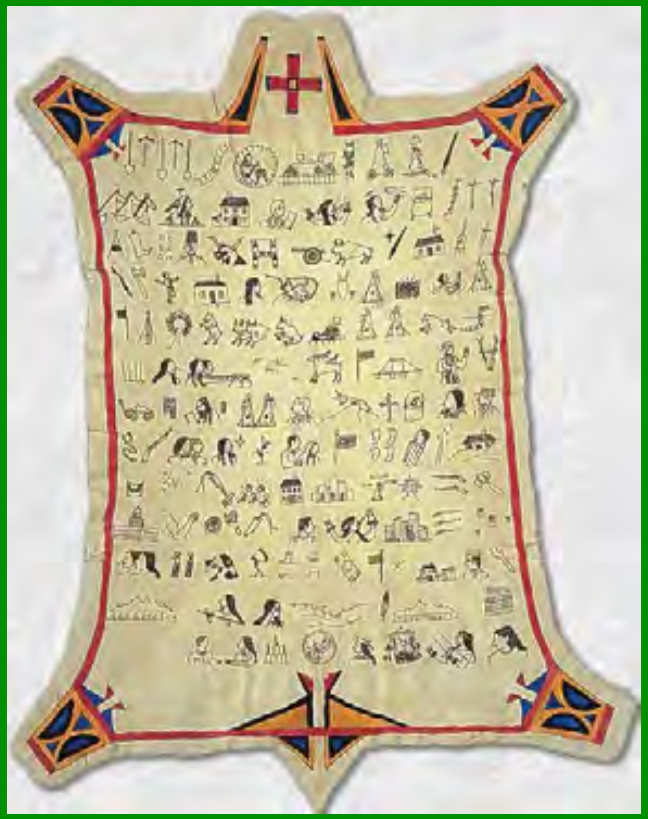
"Continued withdrawal combined with water table decline in larger areas do not allow for aquifer replenishment," said Jarda Solc, EERC Senior Research Manager. "These trends are even more alarming with respect to the fact that the regional hydrologic system, as documented in the EERC project, is currently at its wet stage and the aquifer usage will considerably increase once the system moves to the dry cycle," he said.

"Science is proving that dramatic swings in climate cycles are inevitable in the northern Great Plains," Groenewold said. "Without the development and implementation of substantial, long-term, regional water management strategies, economic growth will, at best, be limited. Indeed, we may not be able to maintain our current economy. The public and decision makers need to recognize the magnitude, severity, and urgency of this issue. Our greatest challenge is to admit we have a problem."

Waniyetu Wowapi or Lakota”Winter Counts"

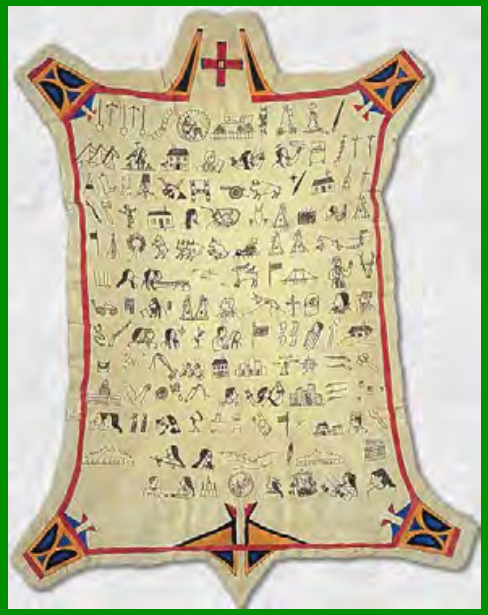
Community historians, known as winter count keepers, maintained and used these pictographic records as mnemonic devices to remember the sequence of events that marked each year.

Lakota *waniyetu wowapi* or "winter counts"

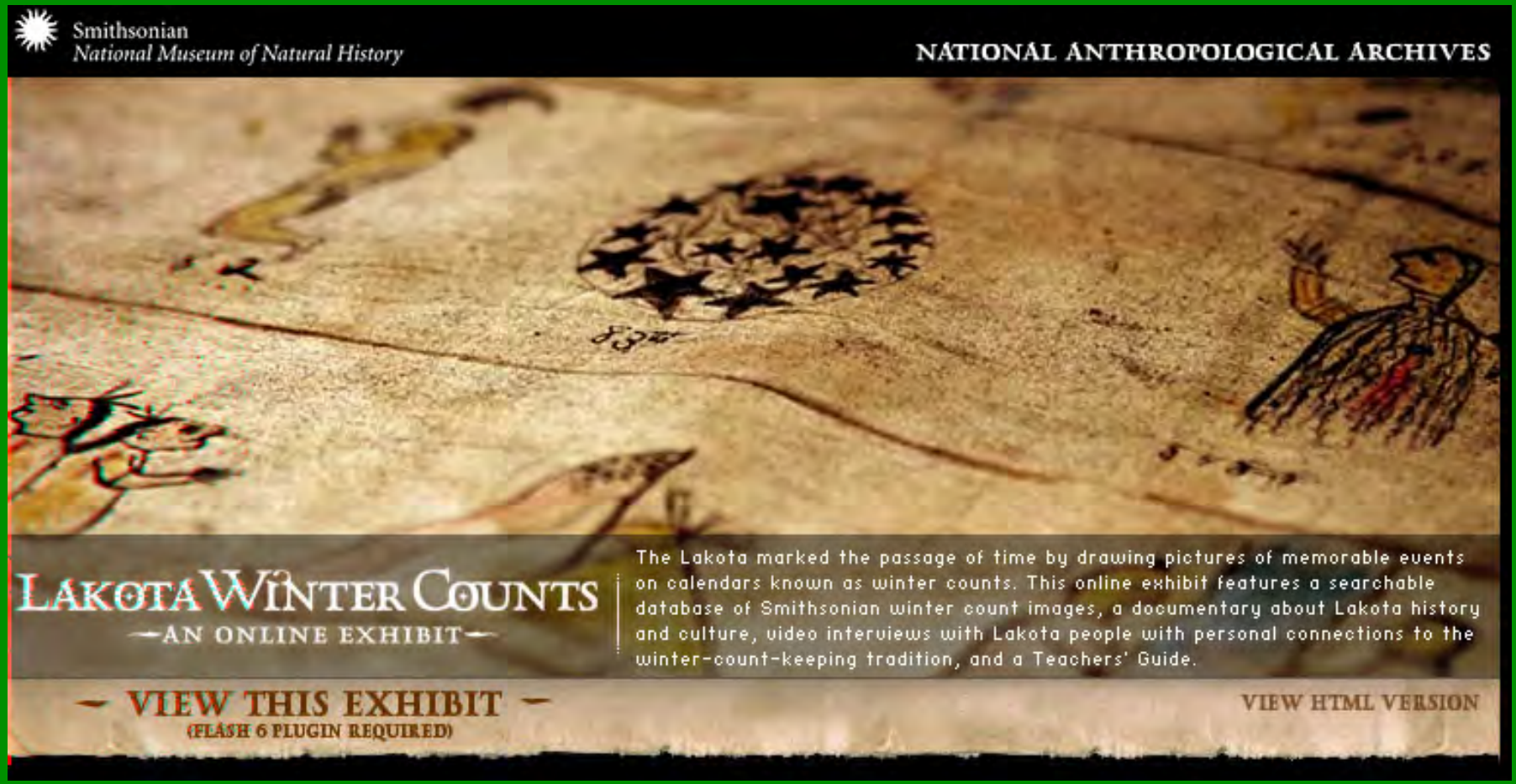


By referring to the winter count, members of a Lakota community could annually mark the **most remarkable** events in their lives.

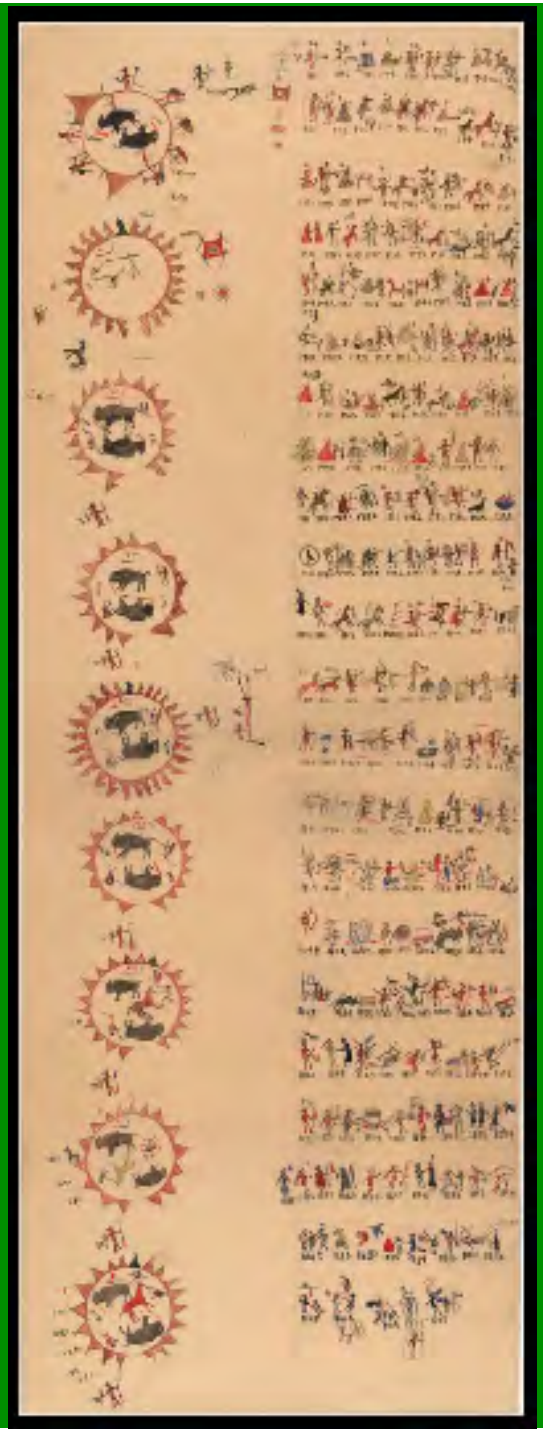
Lakota *waniyetu wowapi* or "winter counts"



The Smithsonian's collection of winter counts documents the history of several Lakota communities over a 200-year period.



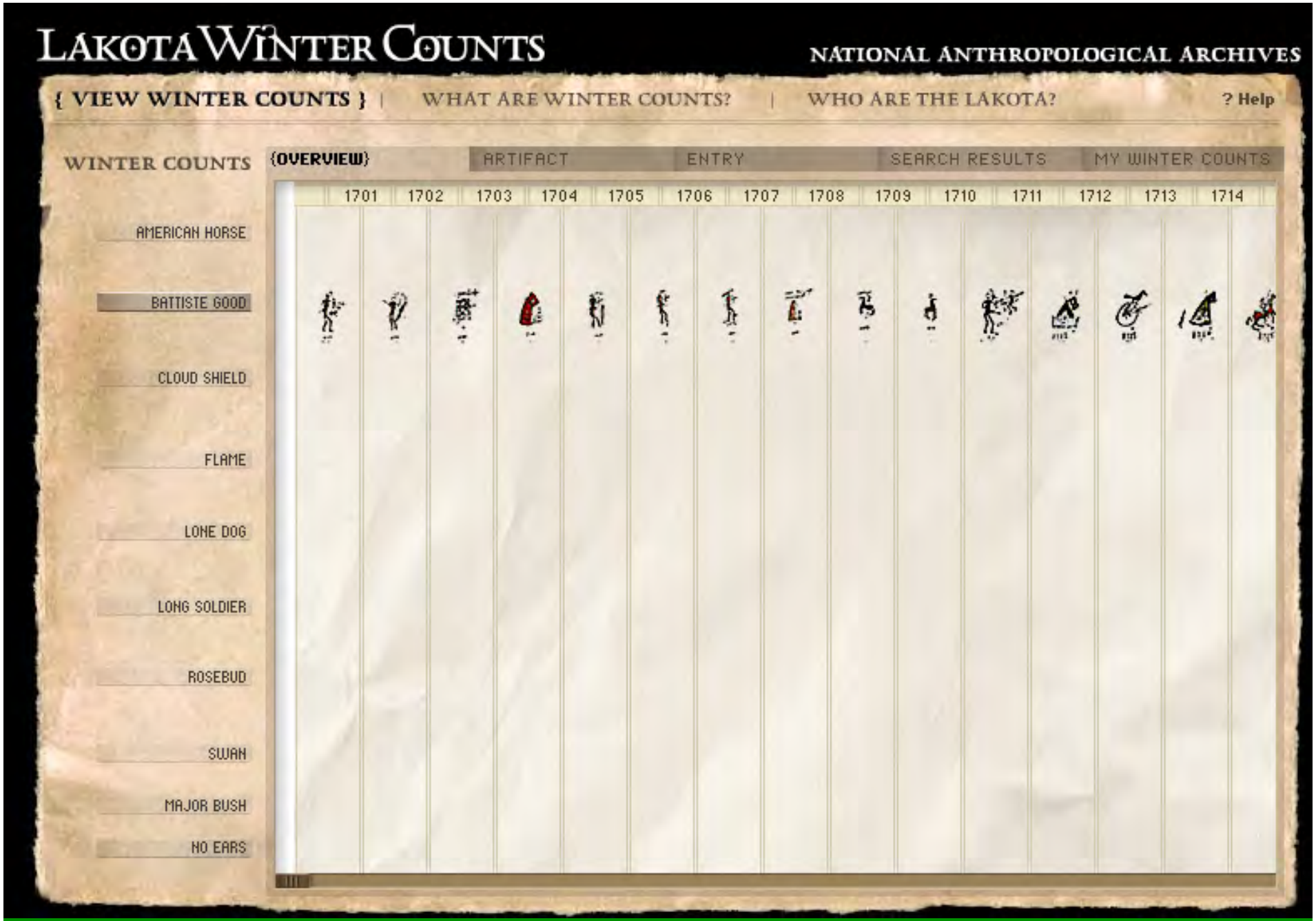
http://wintercounts.si.edu/index.html



A "winter count" was a Native American mnemonic device passed from one generation to another marked with pictographs that recorded noteworthy events in tribal life that took place each "winter" or year. Battiste Good, a Brule Dakota living at the Rosebud Agency in South Dakota, probably made this winter count at the turn of the twentieth century based on original records kept on hides (he introduced Arabic numerals). Special characters denoted famines, the introduction of the horse, buffalo hunts, severe winter storms, smallpox epidemics, and other significant events.

Battiste Good (1821-ca. 1907)
[Winter Count, 1230-1907] Enlargement
Pictograph watercolor on paper panels, ca. 1907
Manuscript Division

http://www.loc.gov/exhibits/treasures/trm054.html



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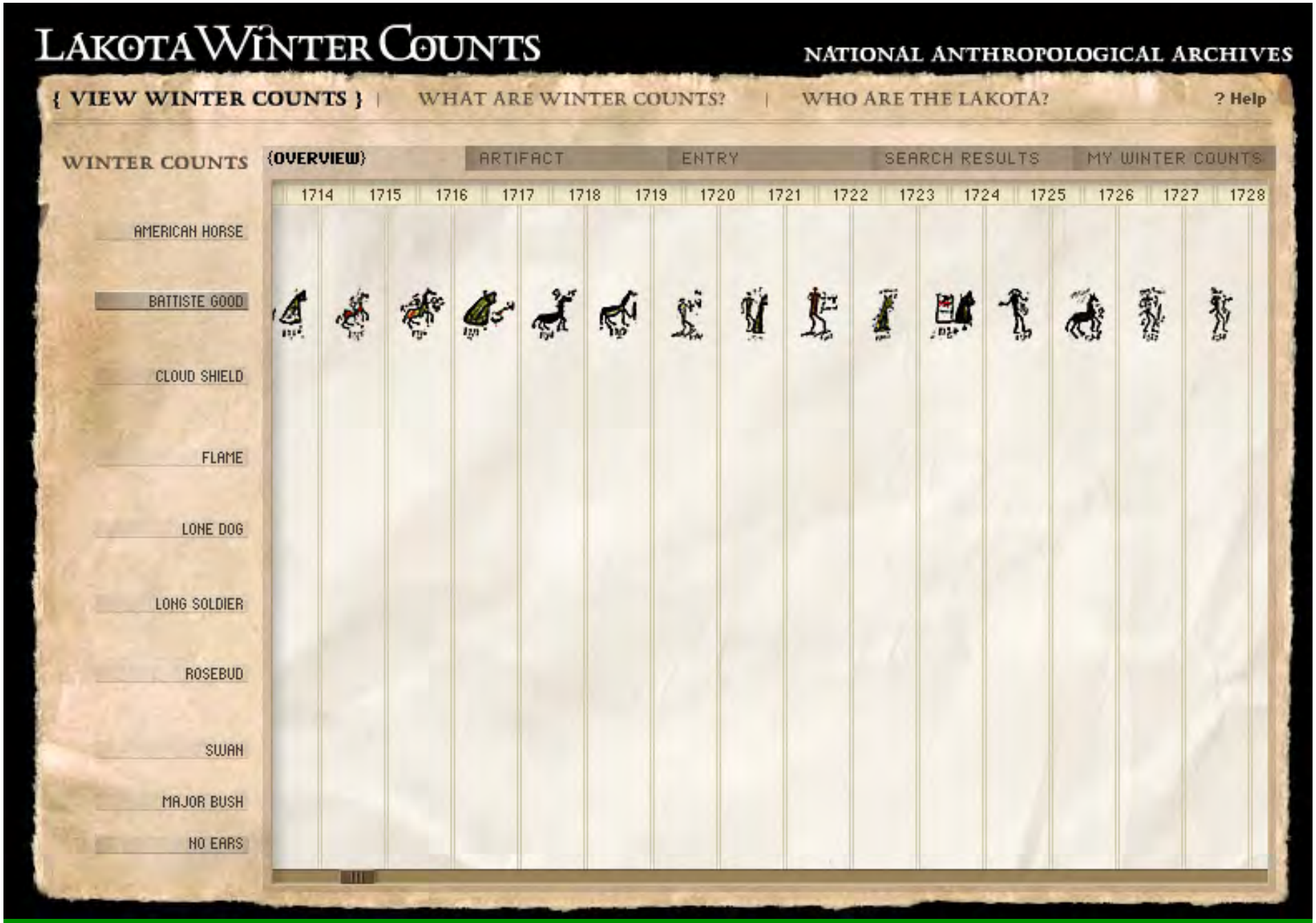

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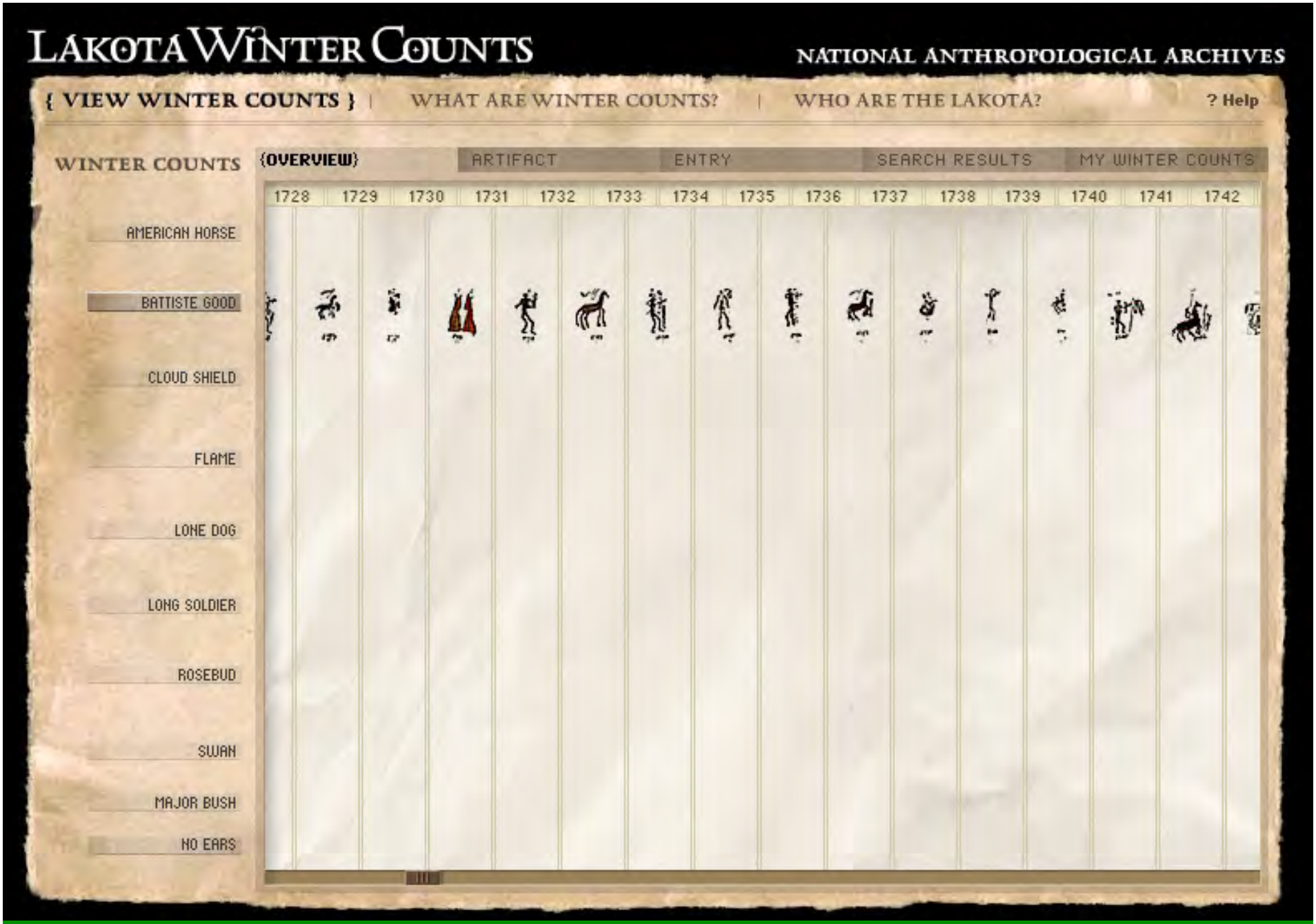

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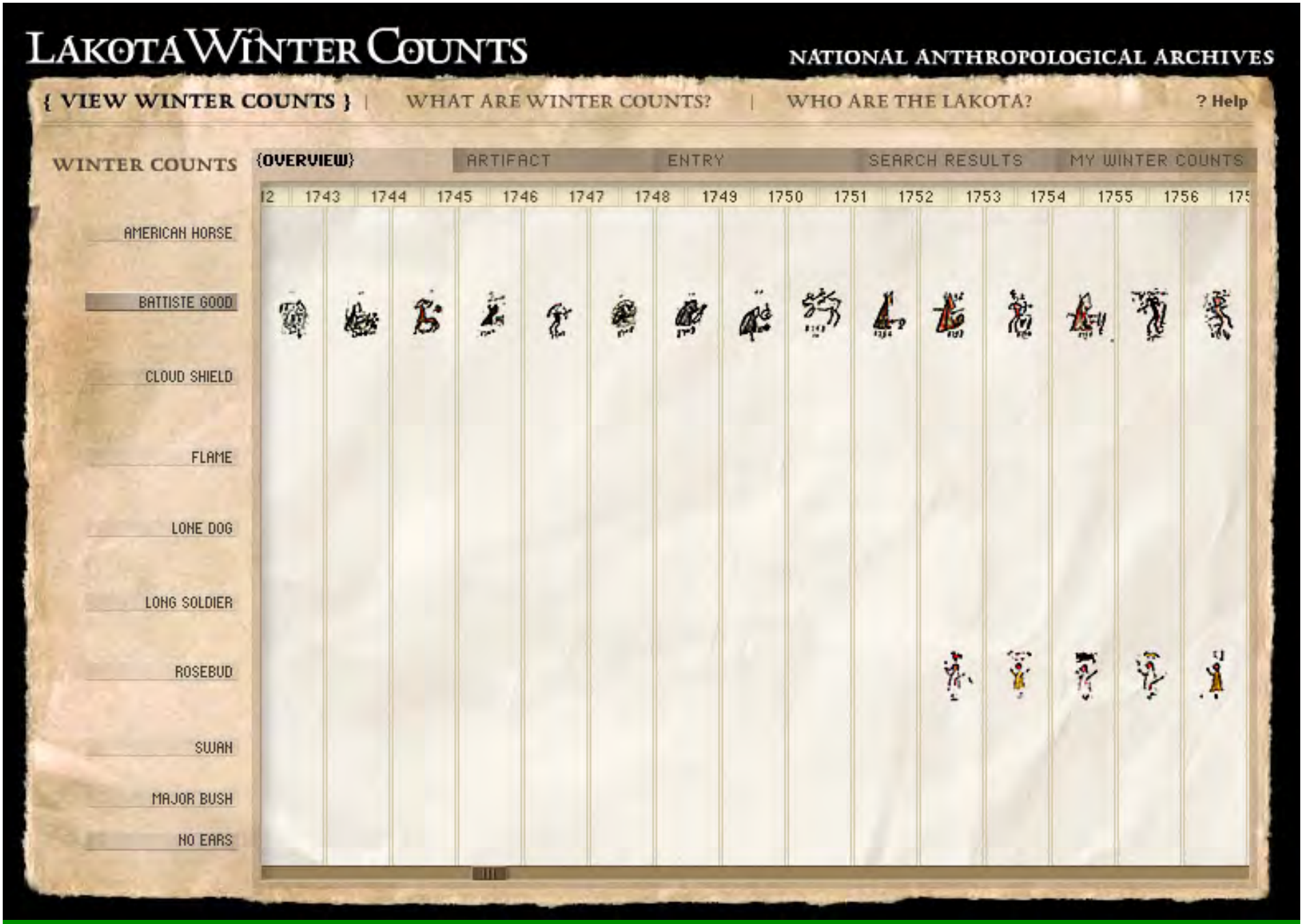

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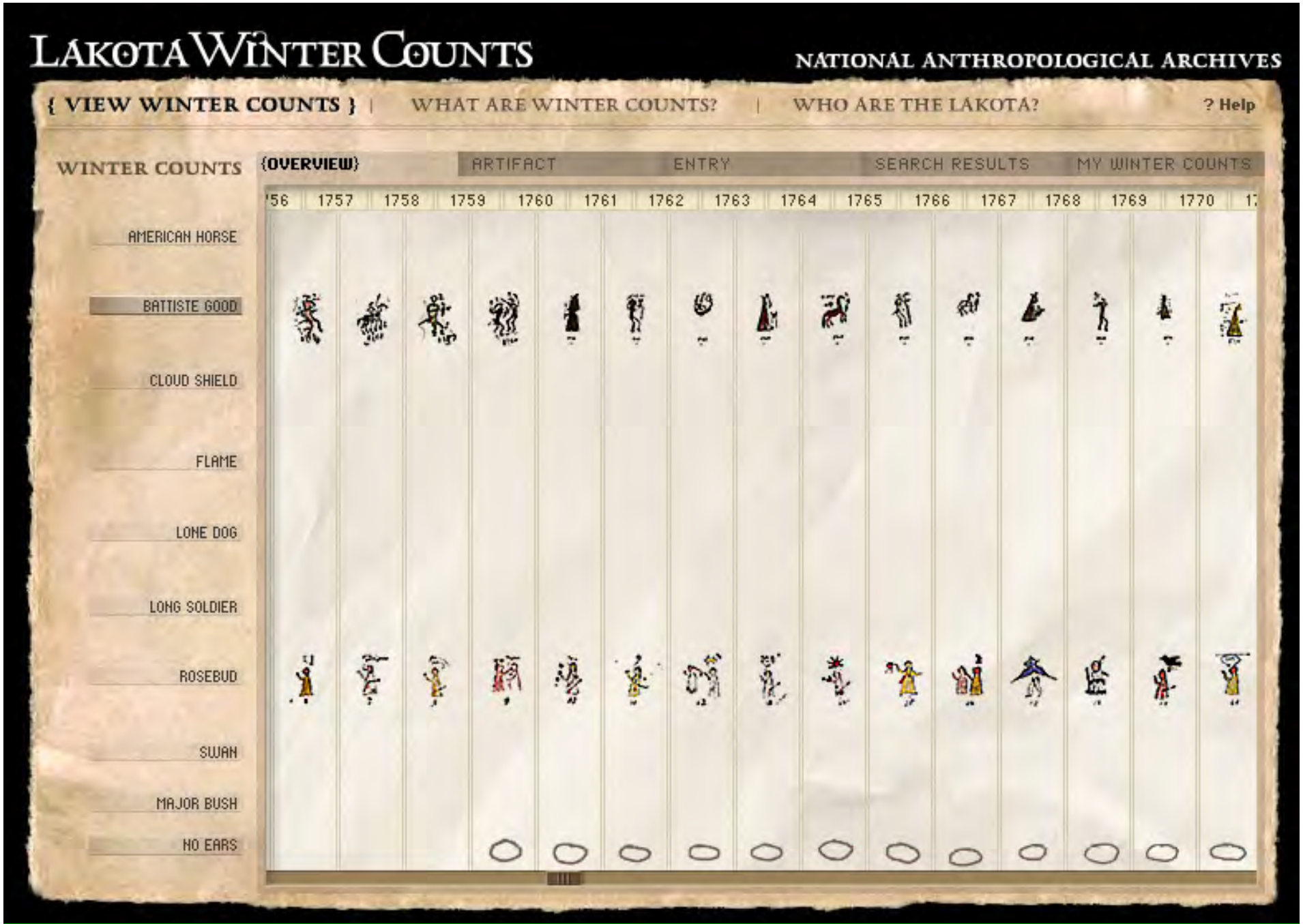

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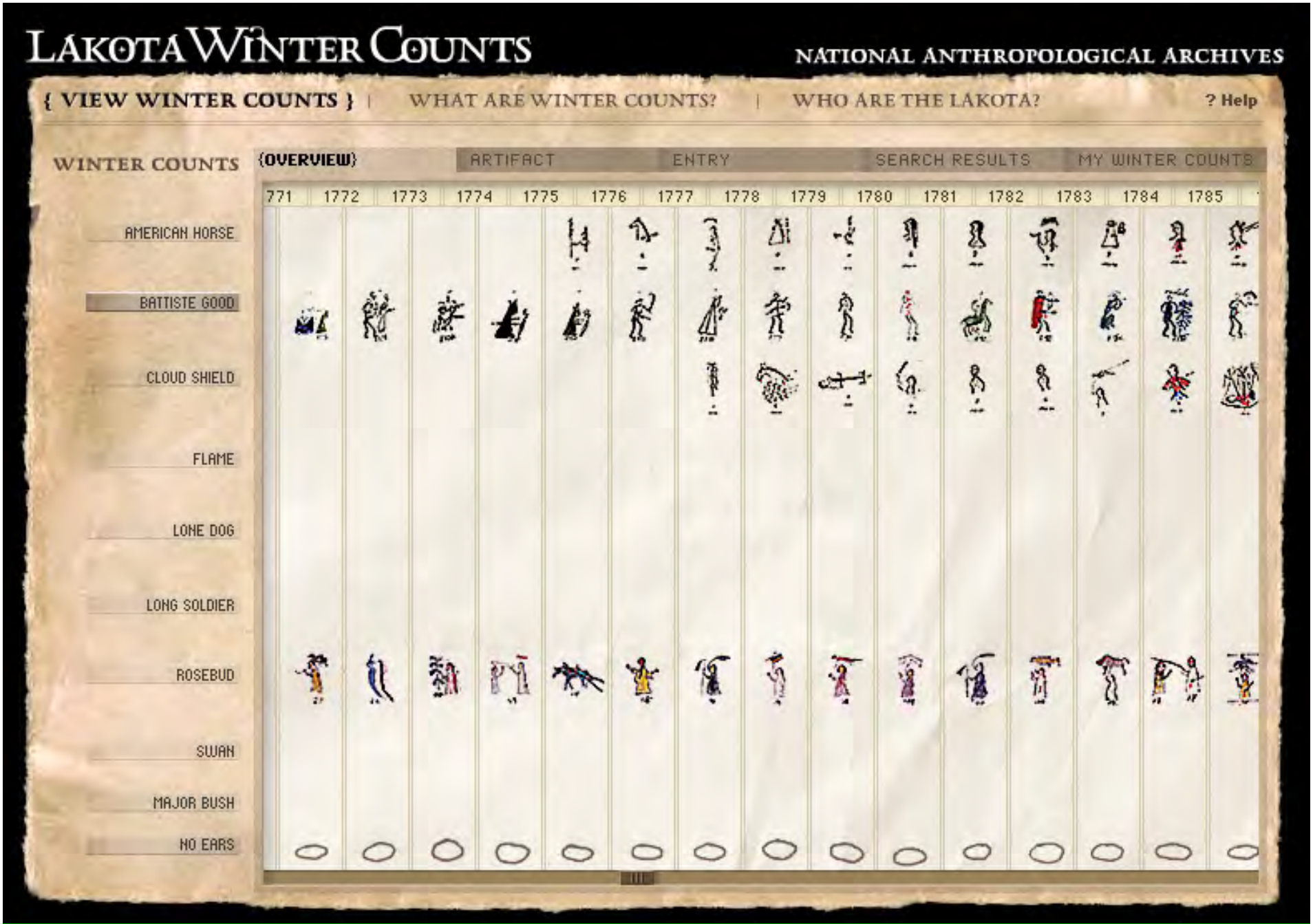

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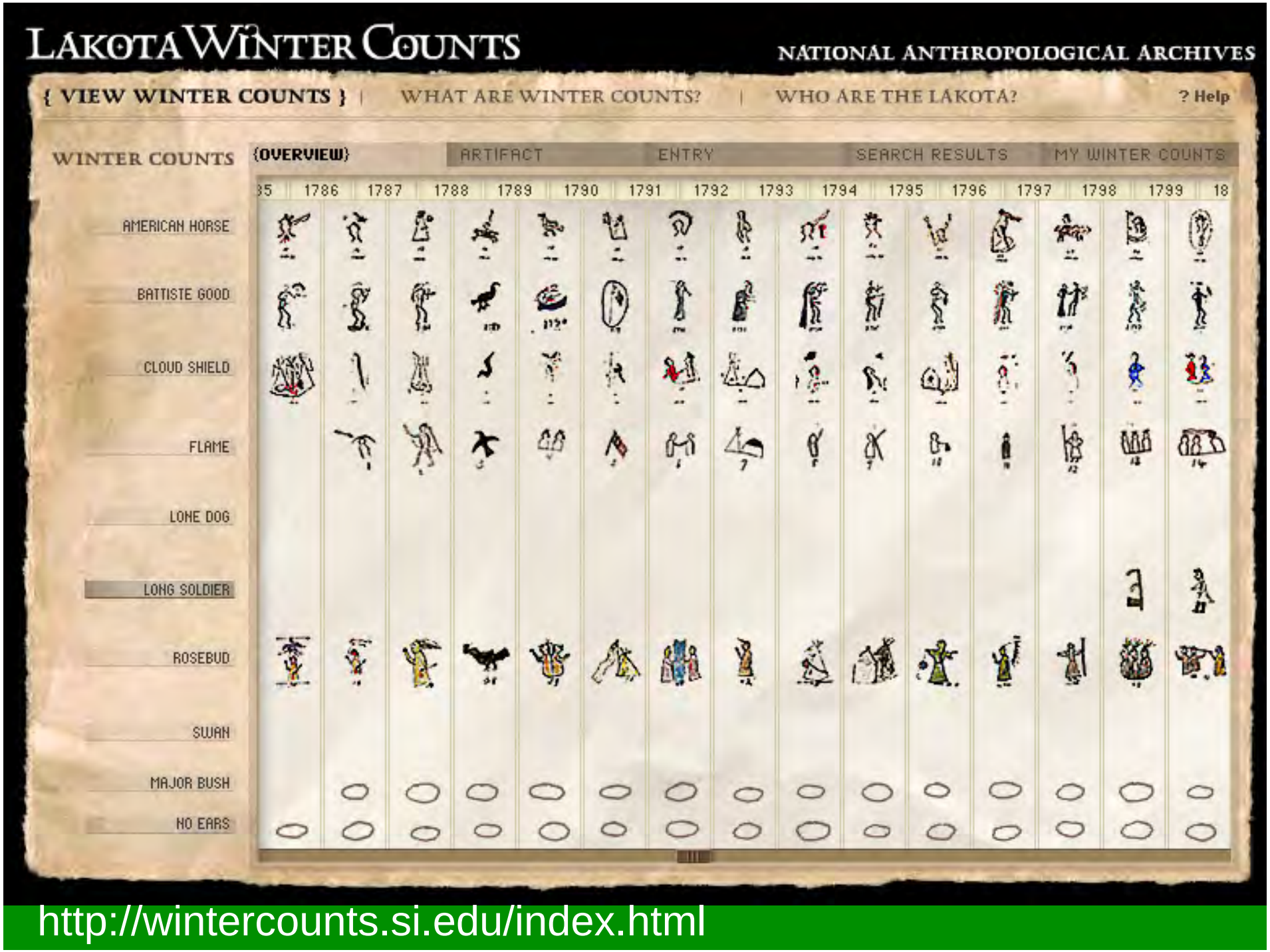

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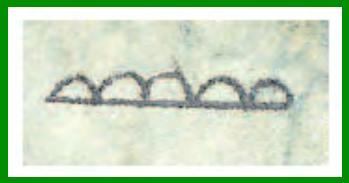
Lakota *waniyetu wowapi* or "winter counts"

A smallpox epidemic killed about 10,000 people on the Great Plains in three weeks during 1837-38. On this winter count, a man covered with spots is used to note smallpox outbreaks in three different years.

This red star, found at the bottom center of the canvas, represents a meteor shower seen throughout North America on November 12, 1833. Every Lakota winter count has a variation of this image for the year 1833-34.



There was a remarkable flood in the Missouri River and a number of Indians were drowned in 1825-26.

The winter of 1818-19, known as the “sand-blowing year,” is pictured as a tipi with brush piled around it as a windbreak.

FOOD RESOURCES
1720 - 1857

TITLE: **Battiste Good**

DATE: 1720-1721 | (33 of 192)

NAME OF YEAR: **Three lodges starved to death winter.**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

COLLECTOR'S NOTE:

The bare ribs of the man denote starvation. (The gesture-sign for poor or lean indicates that the ribs are visible. In the Ojibwa and Ottawa pictographs lines across the chest denote starvation.) (Mallery 1893:297)

+ Collect this Winter Count

TITLE: **Cloud Shield**

DATE: 1835-1836 | (59 of 102)

NAME OF YEAR: **They killed a very fat buffalo bull.**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

COLLECTOR'S NOTE:

+ Collect this Winter Count

TITLE: **Cloud Shield**

DATE: 1787-1788 | (11 of 102)

NAME OF YEAR: **A year of famine.**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

COLLECTOR'S NOTE:

They lived on roots, which are represented in front of the tipi (Corbusier 1886:132).

+ Collect this Winter Count

TITLE: **Cloud Shield**

DATE: 1856-1857 | (80 of 102)

NAME OF YEAR: **They have an abundance of buffalo meat.**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

COLLECTOR'S NOTE:

This is shown by the full drying pole (Corbusier 1886:143).

+ Collect this Winter Count

DESEASES
1780-1785

TITLE: **American Horse**

DATE: 1780-1781 | (6 of 104)

NAME OF YEAR: **Many died of small-pox (Corbusier 1886:131).**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

6

1780-81

COLLECTOR'S NOTE:

Curator's comments

Several other winter counts note smallpox at around this time. Many calendars denote smallpox and measles with a full human figure covered by red spots, but American Horse only shows a bust.

+ Collect this Winter Count

TITLE: **American Horse**

DATE: 1781-1782 | (7 of 104)

NAME OF YEAR: **Many died of small-pox (Corbusier 1886:131).**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

7

1781-82

COLLECTOR'S NOTE:

+ Collect this Winter Count

TITLE: **Battiste Good**

DATE: 1780-1781 | (93 of 192)

NAME OF YEAR: **Smallpox used them up again winter.**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

1781

COLLECTOR'S NOTE:

There is in this figure no sign for pain but the spots alone are shown. An attempt to discriminate and distinguish the year-devices is perceived (Mallery 1893:308).

+ Collect this Winter Count

TITLE: **American Horse**

DATE: 1784-1785 | (10 of 104)

NAME OF YEAR: **A young man with small-pox shot himself.**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

10

1784-85

COLLECTOR'S NOTE:

A young man who was afflicted with the small-pox, and was in his tipi, off by himself, sang his death-song and shot himself. Suicide is more common among Indians than is generally suspected, and even boys sometimes take their own lives. A Dakota boy at one of the agencies shot himself rather than face his companions after his mother had whipped him, and a Pai-Ute boy at Camp McDermit, Nevada, tried to poison himself with the wild parsnip because he was not well and strong like the other boys. The Pai-Utes usually eat the wild parsnip when bent on suicide (Corbusier 1886:131-32).

+ Collect this Winter Count

HOUSING
1722 - 1793

TITLE: **Battiste Good**

DATE: 1722-1723 | (35 of 192)

NAME OF YEAR: **Deep snow and tops of lodges only visible winter.**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

+ Collect this Winter Count

COLLECTOR'S NOTE:

The spots are intended for snow (Mallery 1893:297).

TITLE: **Battiste Good**

DATE: 1770-1771 | (83 of 192)

NAME OF YEAR: **Came and killed the lodges winter.**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

+ Collect this Winter Count

COLLECTOR'S NOTE:

The enemy came on horseback and assailed the Dakota lodges, which were pitched near together, spoiling some of them by cutting the hide coverings with their spears, but killing no one. They used spears only, but arrows are also depicted, as they symbolize attack. No blood is shown on the arrows, as only the lodges were "killed" (Mallery 1893:306).

TITLE: **Battiste Good**

DATE: 1730-1731 | (43 of 192)

NAME OF YEAR: **Came from opposite ways and camped together winter.**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

+ Collect this Winter Count

COLLECTOR'S NOTE:

By a singular coincidence, two bands of Dakotas selected the same place for an encampment, and arrived there the same day. They had been separated a long time, and were wholly ignorant of each other's movements. The caps of the tipis face each other (Mallery 1893:299).

TITLE: **Flame**

DATE: 1792-1793 | (7 of 91)

NAME OF YEAR: **Dakotas and Rees meet in camp together, and are at peace.**

Previous Year | Next Year | Next in Search Results

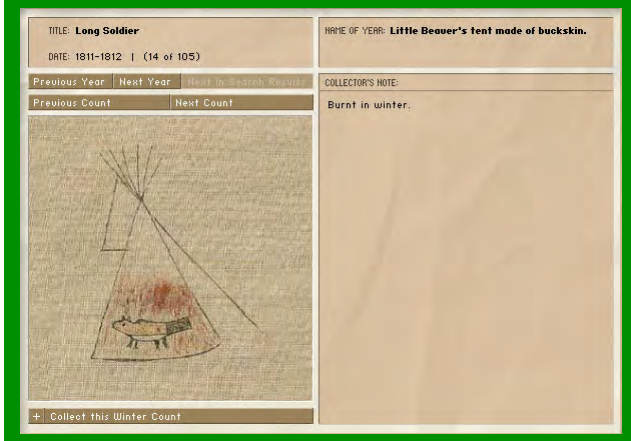
Previous Count | Next Count

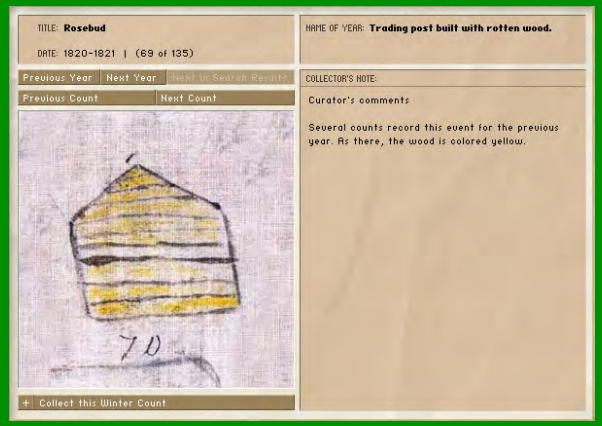
+ Collect this Winter Count

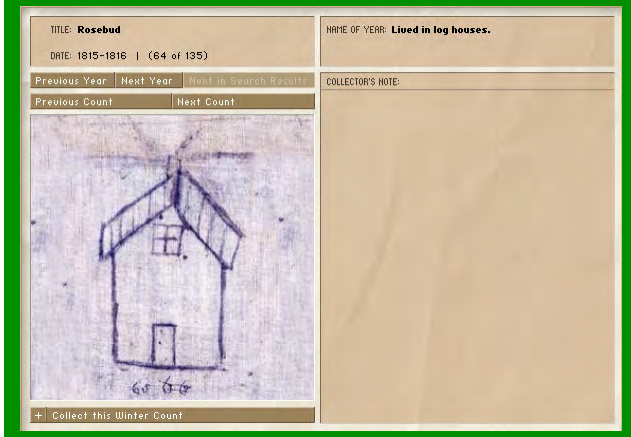
COLLECTOR'S NOTE:

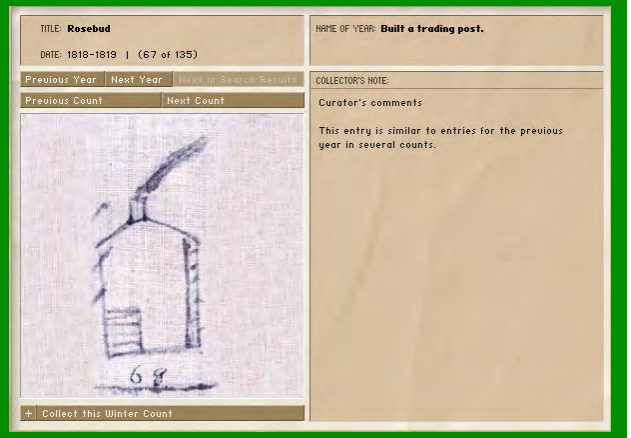
The two styles of dwellings, viz., the tipi of the Dakotas, and the earth lodge of the Arickaras , are apparently depicted (Mallery 1886:101).

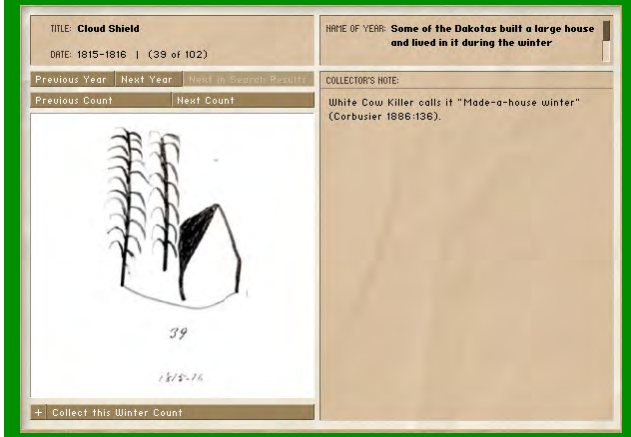
HOUSING
Types Referenced
1811-1822

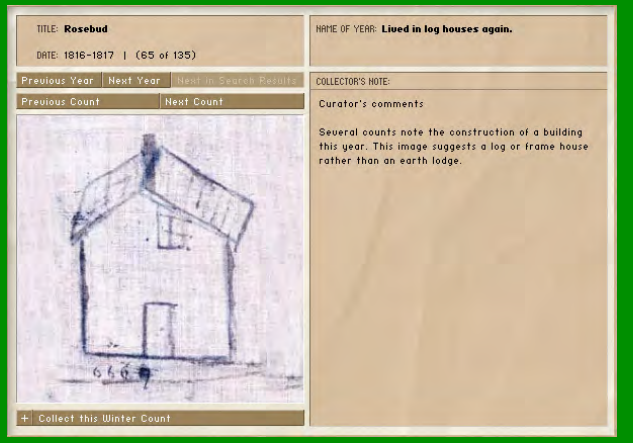












Eat Frozen Fish Winter
1748 - 1749

TITLE: **Battiste Good**

DATE: 1748-1749 | (61 of 192)

NAME OF YEAR: **Eat frozen fish winter.**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

+ Collect this Winter Count

COLLECTOR'S NOTE:

They discovered large numbers of fish frozen in the ice, and subsisted on them all winter (Mallery 1893:302).

Deep Snow and Tops of Lodges Only Visible Winter 1722-1723

TITLE: **Battiste Good**

DATE: 1722-1723 | (35 of 192)

NAME OF YEAR: **Deep snow and tops of lodges only visible winter.**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

+ Collect this Winter Count

COLLECTOR'S NOTE:

The spots are intended for snow (Mallery 1893:297).

Traditional Knowledge and Indigenous Observations

Lakota *waniyetu wowapi* or "winter counts"

The Smithsonian's collection of winter counts documents the almost 200 year history of several Lakota communities to 1880s.

LAKOTA WINTER COUNTS

NATIONAL ANTHROPOLOGICAL ARCHIVES

{ VIEW WINTER COUNTS } | WHAT ARE WINTER COUNTS? | WHO ARE THE LAKOTA? ? Help

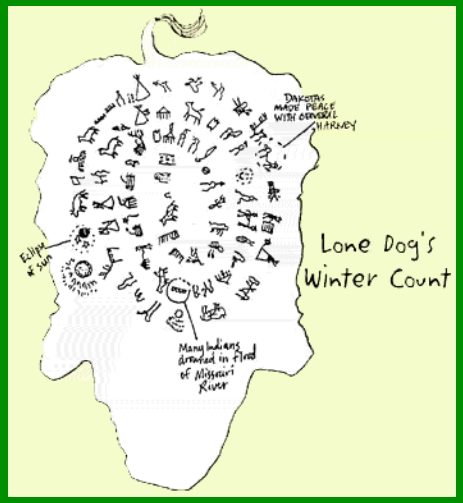
WINTER COUNTS (OVERVIEW) ARTIFACT ENTRY SEARCH RESULTS MY WINTER COUNTS

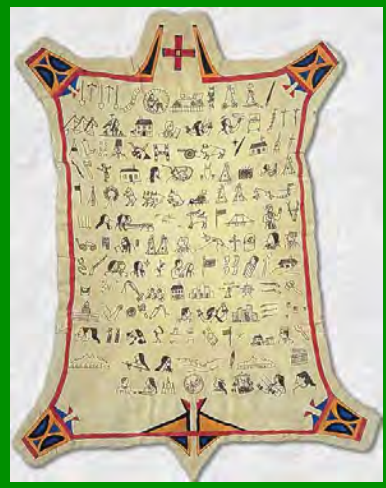
1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843

AMERICAN HORSE
BATTISTE GOOD
CLOUD SHIELD
FLAME
LONE DOG
LONG SOLDIER
ROSEBUD
SWAN
MAJOR BUSH
NO EARS

http://wintercounts.si.edu/index.html

Lakota *waniyetu wowapi* or "winter counts"





Lakota winter counts — pictographic calendars of a community's history — provide a unique look into the history of the Lakota Sioux people during the 18th and 19th centuries. Unlike historical accounts recorded by European settlers and explorers, winter counts represent a rich Lakota tradition of oral history and storytelling. Community historians, known as winter count keepers, maintained and used these pictographic records as mnemonic devices to remember the sequence of events that marked each year. By referring to the winter count, members of a Lakota community could mark events in their own lives.

WINTER EXTREMES

TITLE: **Battiste Good**

DATE: 1722-1723 | (35 of 192)

NAME OF YEAR: **Deep snow and tops of lodges only visible winter.**

Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

COLLECTOR'S NOTE:

The spots are intended for snow (Mallery 1893:297).

+ Collect this Winter Count

TITLE: **Battiste Good**

DATE: 1748-1749 | (61 of 192)

NAME OF YEAR: **Eat frozen fish winter.**

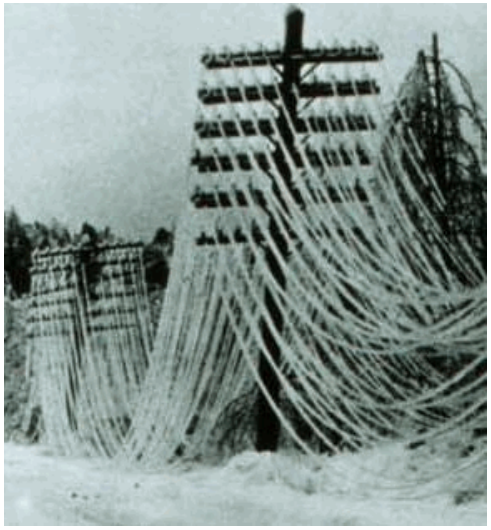
Previous Year | Next Year | Next in Search Results

Previous Count | Next Count

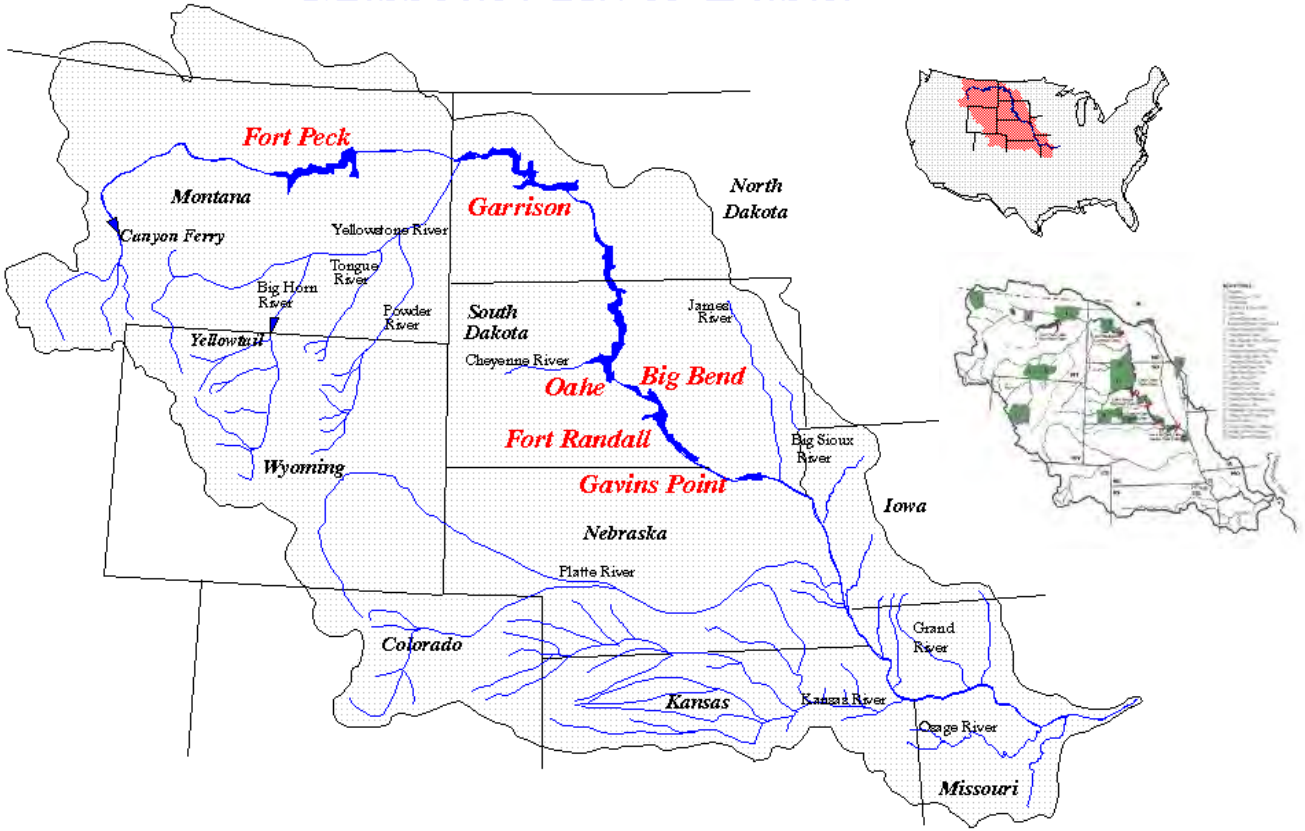
COLLECTOR'S NOTE:

They discovered large numbers of fish frozen in the ice, and subsisted on them all winter (Mallery 1893:302).

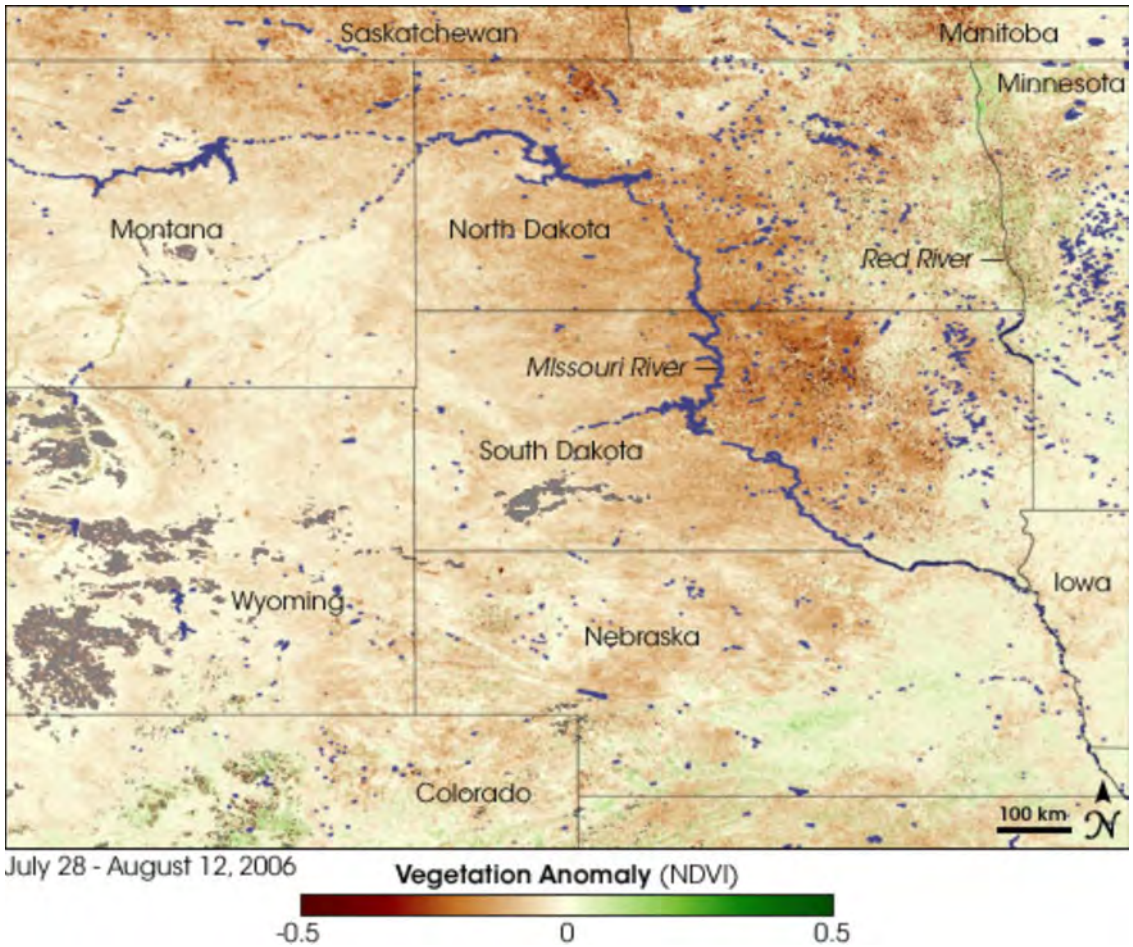
+ Collect this Winter Count



Missouri River Basin



Drought on the Great Plains



One of the most common satellite-based vegetation maps is a scale, or index, of vegetation greenness called the “NDVI,” short for *Normalized Difference Vegetation Index.* This image compares NDVI values from July 28-August 12, 2006, to the average values from 2001-2005.

A Perfect Drought in the West

"The two problems — water and energy — are so intimately linked as to make it exceedingly difficult to tackle one without the other.

The less water in our rivers, for instance, the less hydropower our dams produce. The further the water tables sink, the more power it takes to pump water up. The more we depend on coal and nuclear power plants, which require huge amounts of water for cooling, the larger the burden we place on supplies.

The Perfect Drought
NYTimes 10.21.07

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

The Four Workshop Questions

What are current concerns and stresses on tribal lands?

How might climate variability and change impact these stresses?

What kinds of coping options and adaptation strategies are available?

What is needed in your region to implement these coping & adaptation strategies?

NPNH2 Outcomes

- **Increased Dialogue among Tribes, TCUs, Students, etc.**
- **Input to White House CC Planning (CEQ)**
  - **"Listening Session"** from Council of Environmental Quality (CEQ)
- **Mystic Lake Declaration**
  - Presented at UN COP 15, Copenhagen
- **Workshop Report**
  - In preparation
- **Follow-up projects** at TCUs
- **3 Continuing** Education Credits (UTTC)

Native Peoples/Native Homelands 1 & 2 Workshop Recommendations

Tribal Colleges - Key Role

- Developing Adaptation & Coping Strategies
- Managing Data Collection, Use & Protection

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

Workshop Follow-up? Some Possible Next Steps….

Leadership = Tribal Colleges/Native Peoples

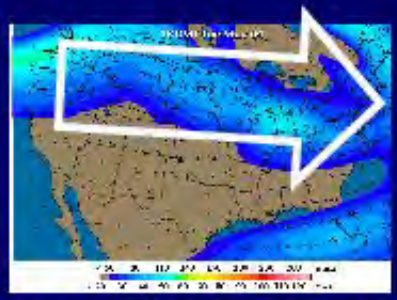
- **Make mini-grants available to TCUs to do workshop follow-up**
  - **AIANCCWG/Wildcat**
  - **NASA TCUP solicitation & other agency programs**
- **Use grants to support student/faculty projects on:**
  - **Create status of knowledge & action steps on highest priority issues**
    - **Class projects, curricula**
    - **Research projects**
- **Faculty/students/tribes do data gathering on impacts & adaptive possibilities**
  - **Indigenous/traditional knowledge**
  - **Science, Business, Jobs**

Workshop Follow-up? Some Possible Next Steps….

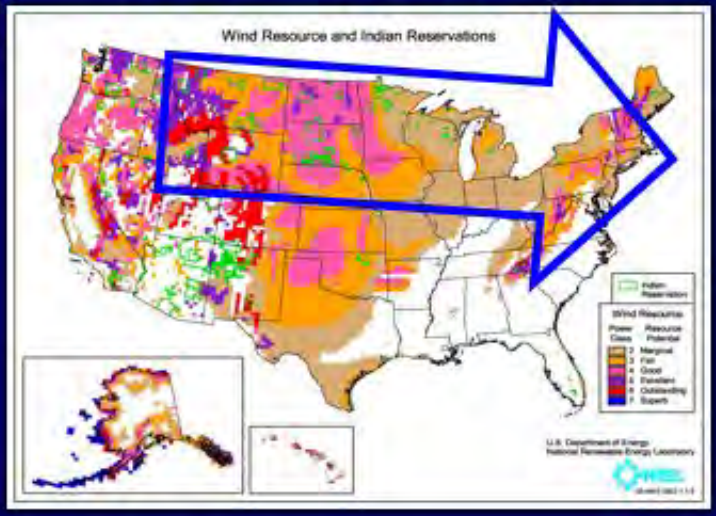
Leadership = Tribal Colleges/Native Peoples

- **Work-study projects on real-world solutions**
  - **Mitigation: Solar & Wind power**
  - **Mitigation/Adaptation: Straw bale, other housing solutions**
  - **Education: Weather stations, data monitoring, experiments**
- **Partner with agencies responsible for these issues**
  - **DOI, BIA, HUD, NOAA, DOE, et al.**
  - **Bring agency projects to reservations / TCUs**
- **Training & resources for jobs/projects on reservations**
- **Create Native talent/expertise pool**
  - **Future leaders, capacity and economic development**
- **Documenting & communicating indigenous/traditional knowledge**

Tribal Colleges and Wind Resources

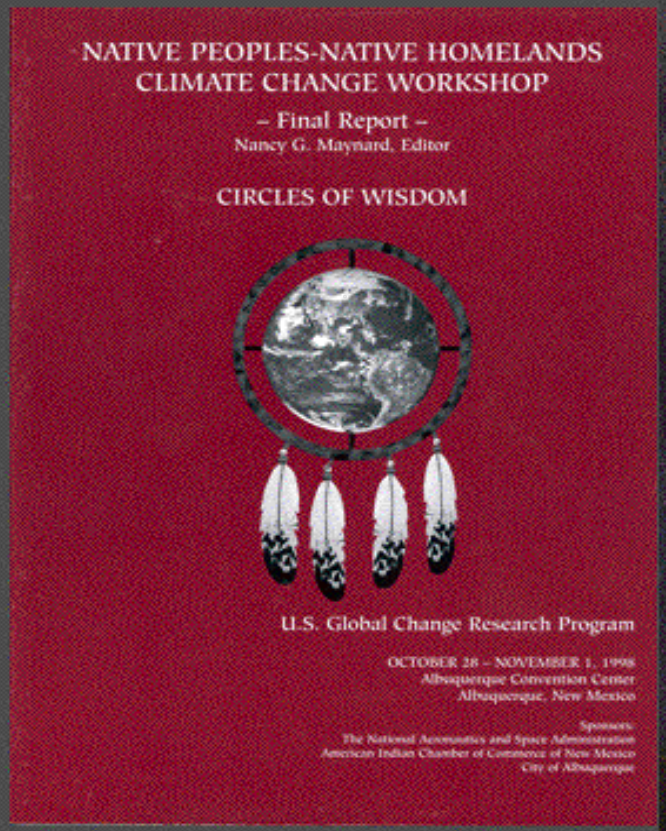


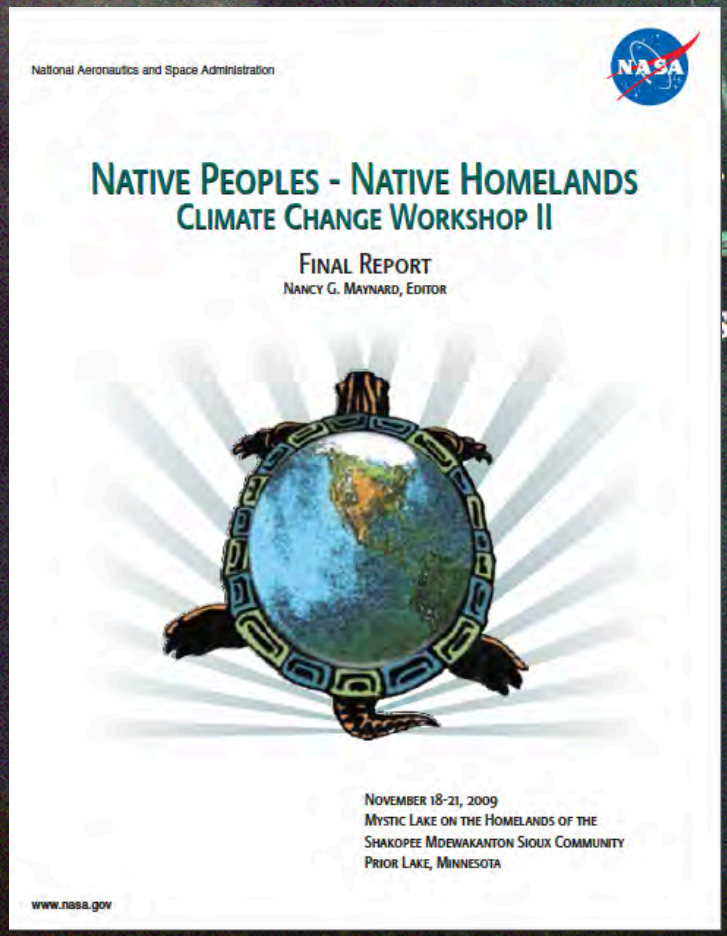
Prevailing Windshed



- 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

Native Peoples Native Homelands





www.usgcrp.gov/usgcrp/Library/nationalassessment/native.pdf

www.EnergyIndependenceDay.org

Intertribal Council On Utility Policy

In the last century, Western rivers, such as the Missouri, were the initial source of utility scale electric energy generation.

Today, rivers of western coal provide the bulk of utility scale electric energy generation and increased CO_2 emissions.

Accelerating green house gas (GHG) accumulation contributes to reduced snowpack and river flows.

The Missouri River is at its lowest flow in its recorded history, with trees now growing along exposed banks.

Accelerating green house gas (GHG) accumulation also contributes to increased biotic landscape transformations, in this case, due to bark beetle infestations.

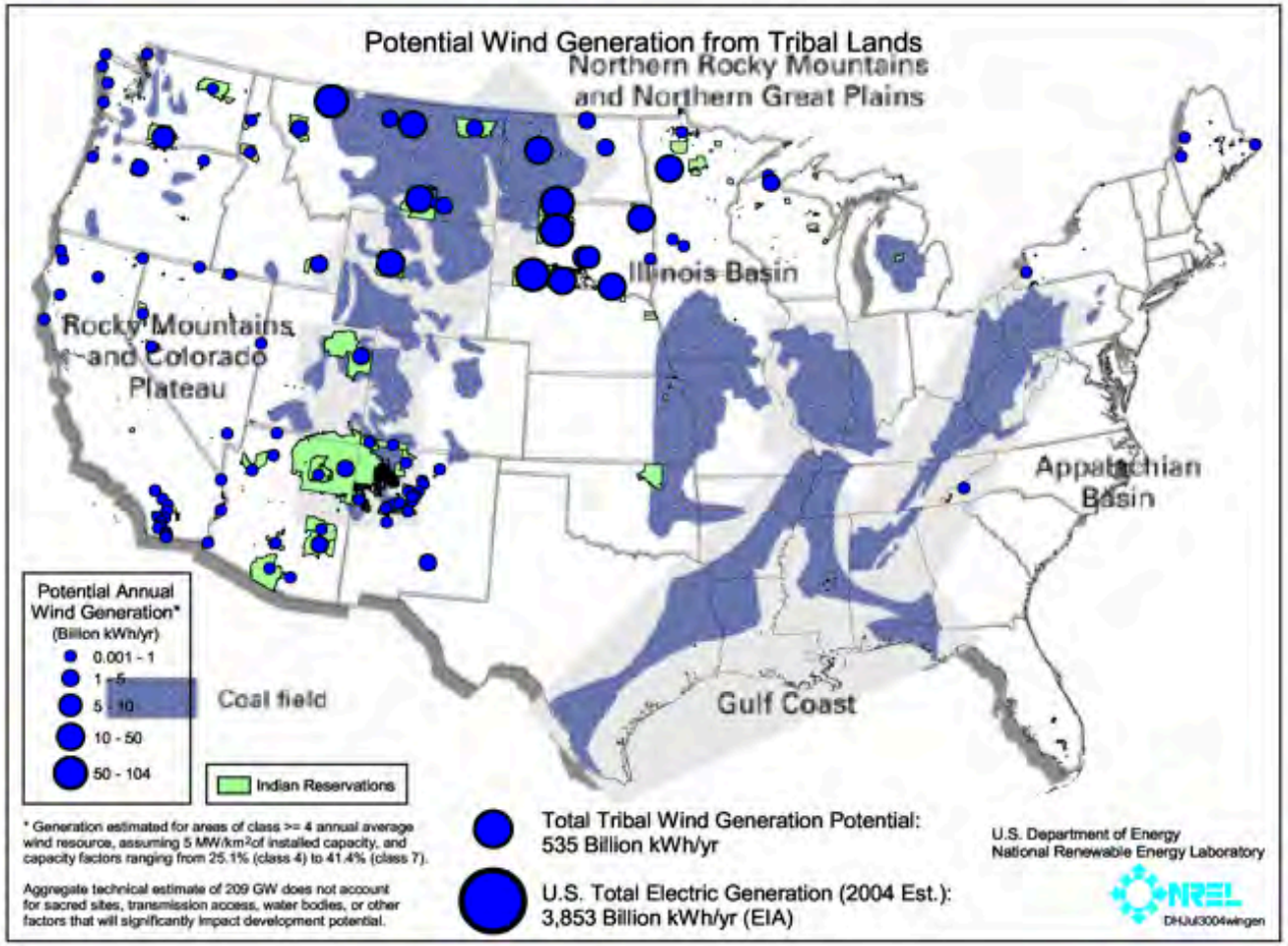
Native Peoples Native Homelands

Utility scale, emissions-free, renewable energy generation can provide clean power and sustainable economic development for Tribal communities across the West.

Renewable wind energy has a difficult time trying to find a place on the grid long dominated by coal interests.

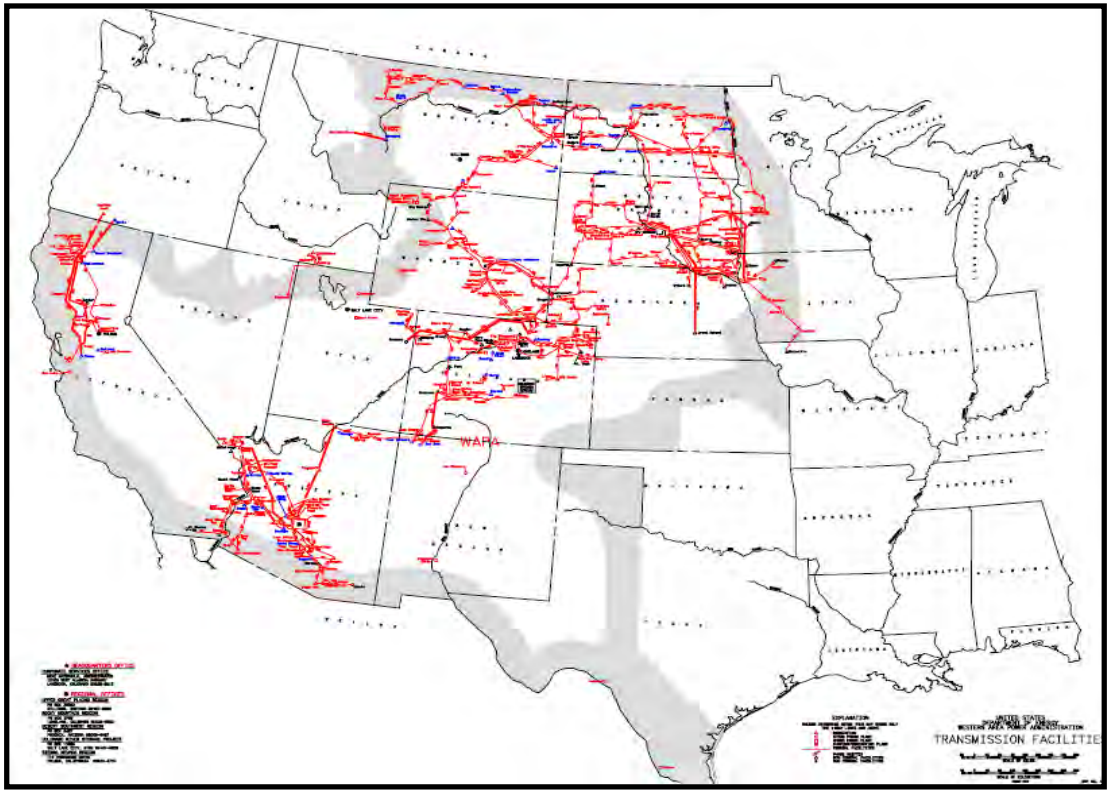
The Fundamental Sources of ... and Solutions to Global Warming!

Reliance on fossilized hell-fire, and not our more heavenly resources, has resulted in a significantly warmer planet.



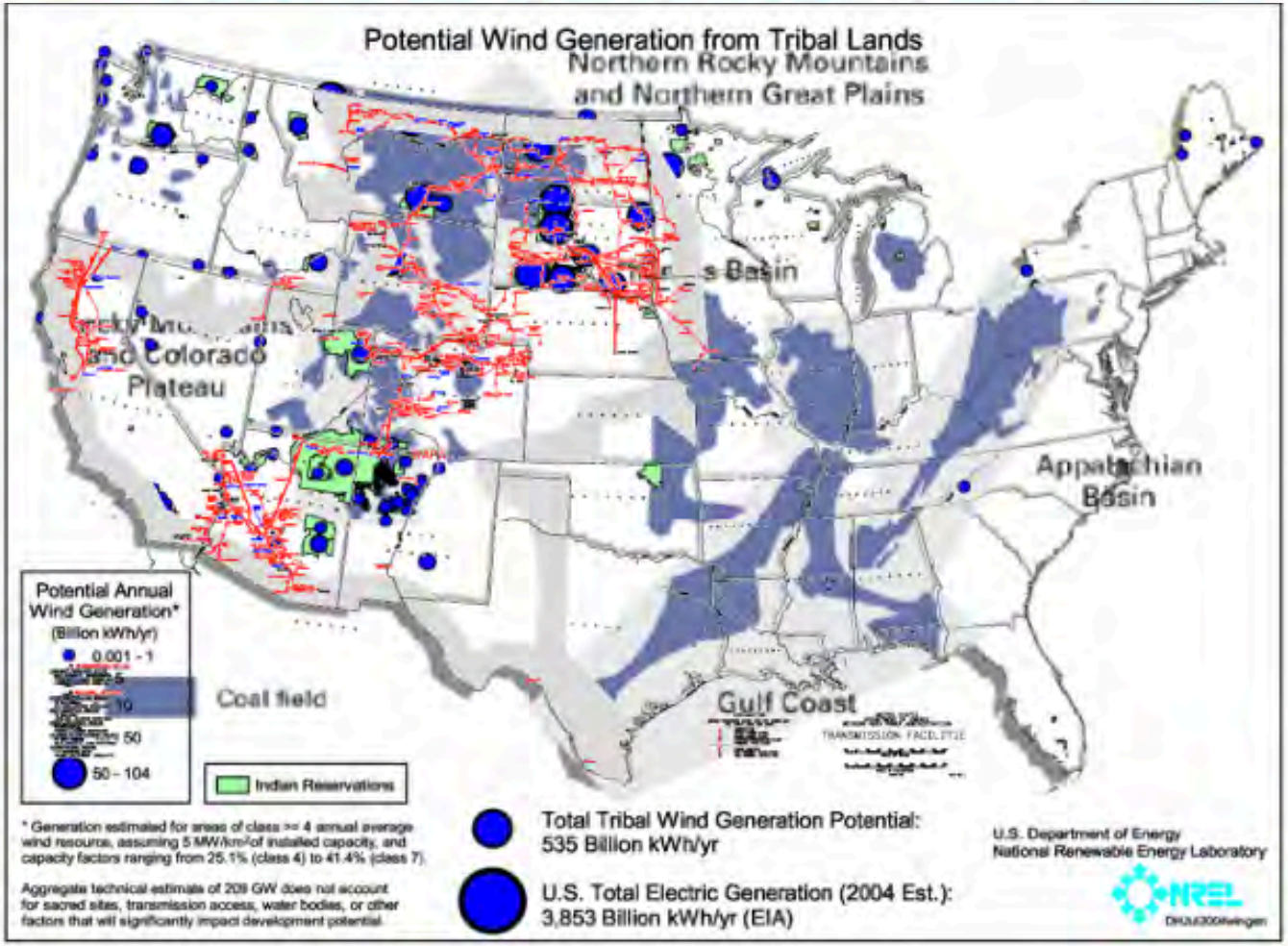
Tribal wind potential sits atop western coal resources.

WAPA: The National Renewable Energy Grid



Original 'Backbone' of the western transmission system built by federal Bureau of Reclamation to deliver power from federal dams operated by BoR and Army Corps of Engineers. The system is owned and operated by the federal government.

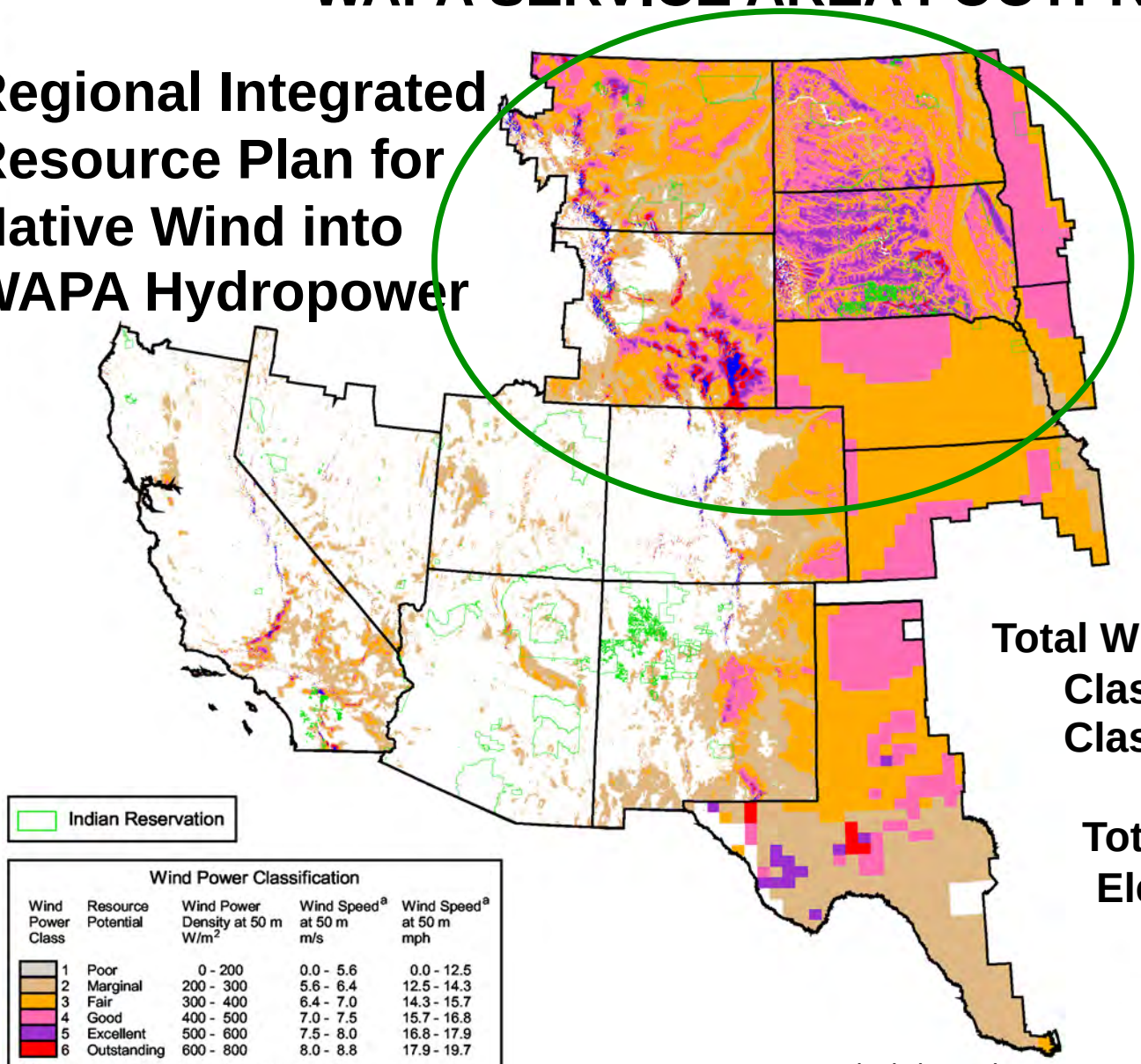
Native Peoples Native Homelands



Both western coal and tribal wind require the same federal hydropower transmission system to get electricity to market.

WAPA SERVICE AREA FOOTPRINT

Regional Integrated Resource Plan for Native Wind into WAPA Hydropower



Western Area Power Administration
Wind Power Potential

Nine of the Top Ten Wind States in the U.S. are located in the WAPA Service Territory

WAPA's total hydro-power capacity is 17,474 MWs with 2,791 MWs UGPR

Total Wind Power Potential:
Class 3+ 4,500 GWs
Class 4+ 2,000 GWs

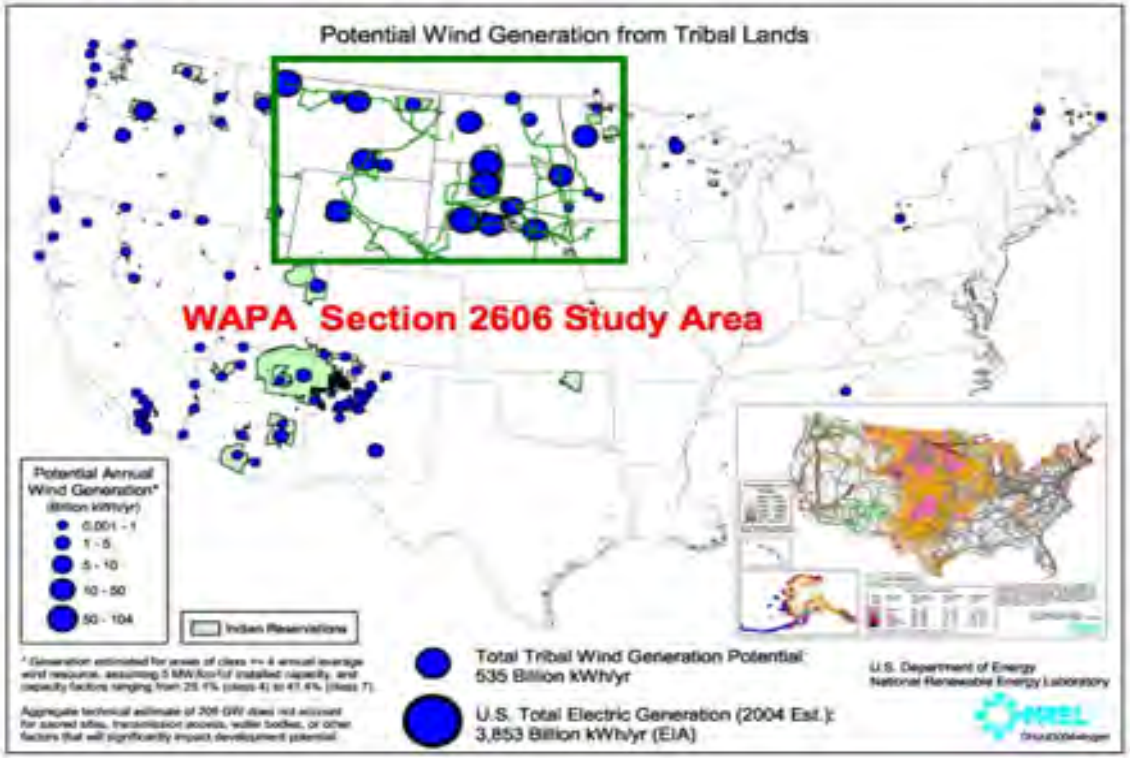
Total U.S. Installed Electric Capacity
~ 800 GWs

U.S. Department of Energy
National Renewable Energy Laboratory

NREL
07-FEB-2005 5.2.1

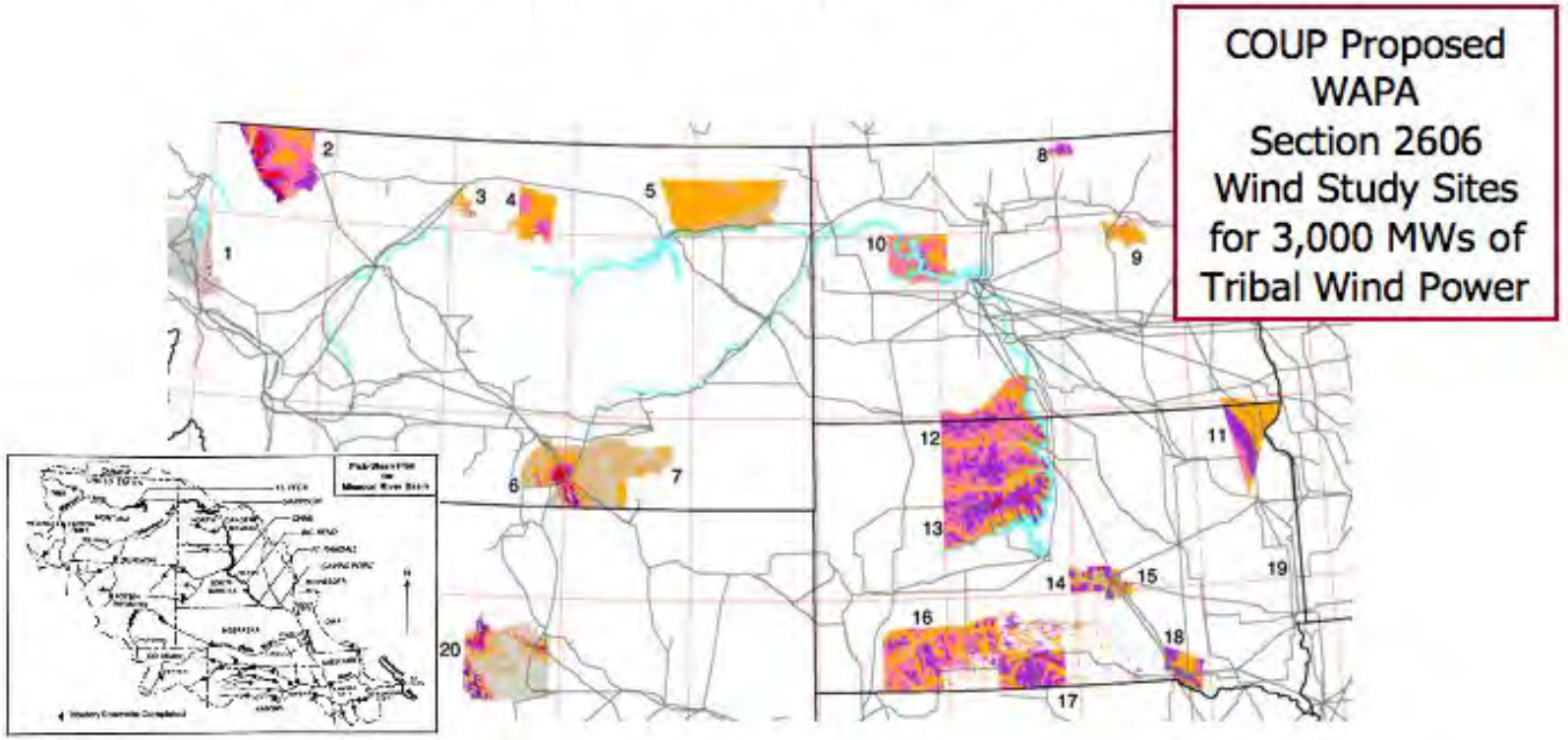
TRIBAL WIND AND FEDERAL HYDROPOWER

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.



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.

Wind/Hydro Feasibility Study Area (Section 2606)

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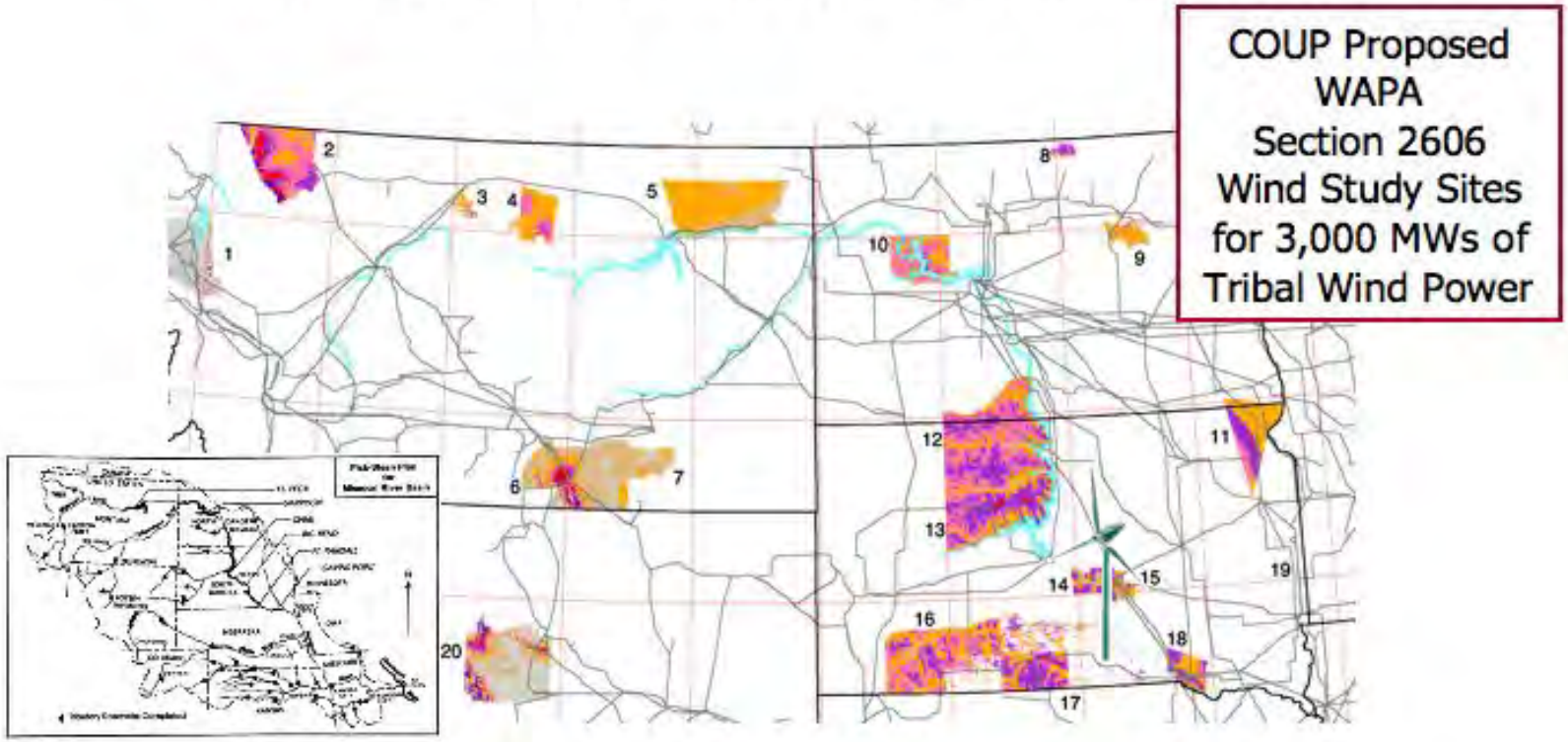

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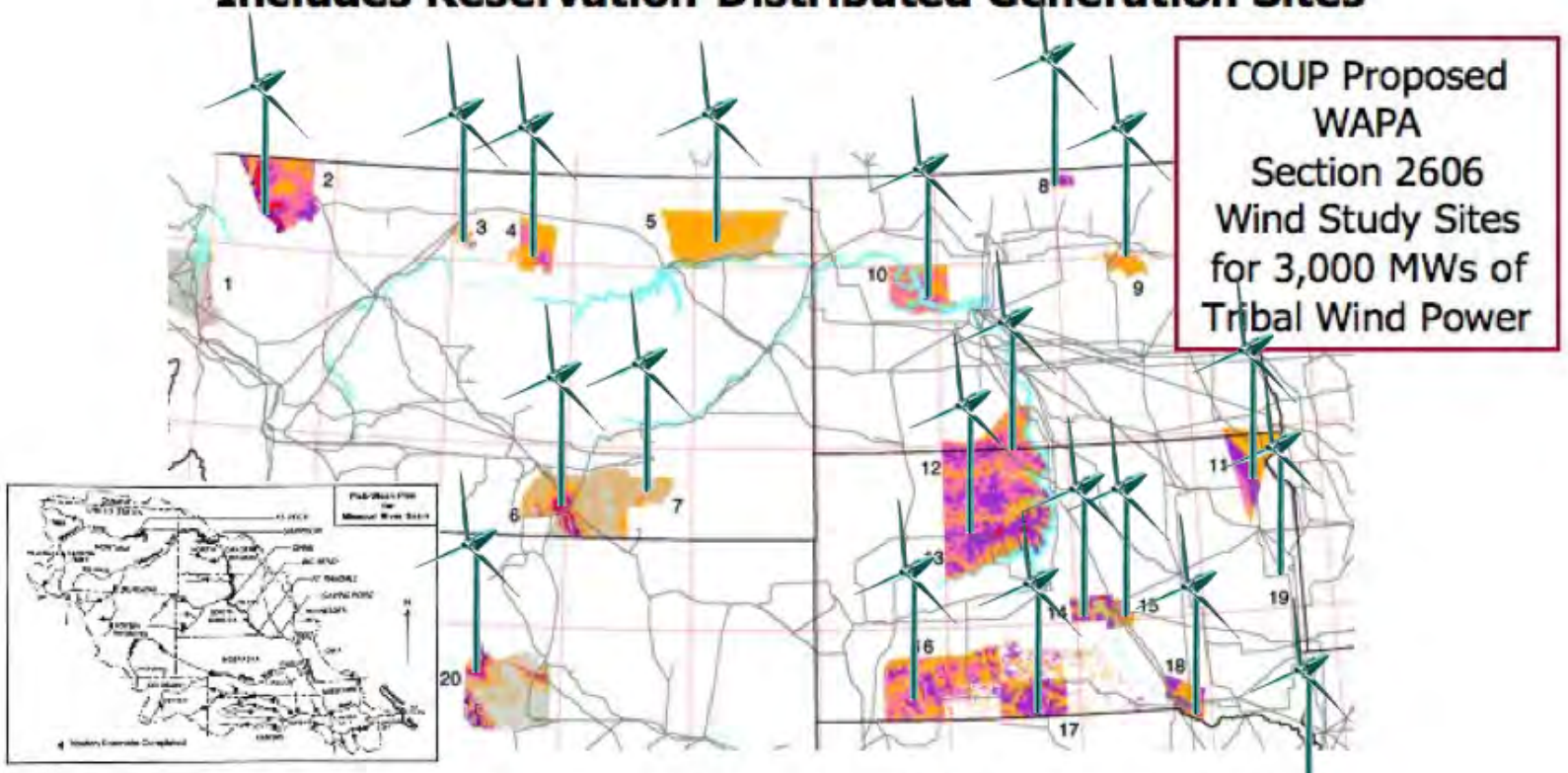

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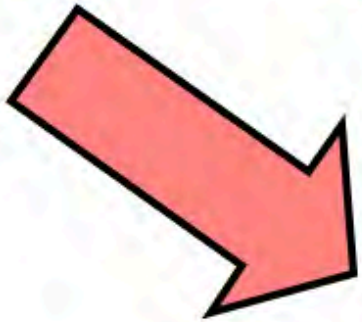
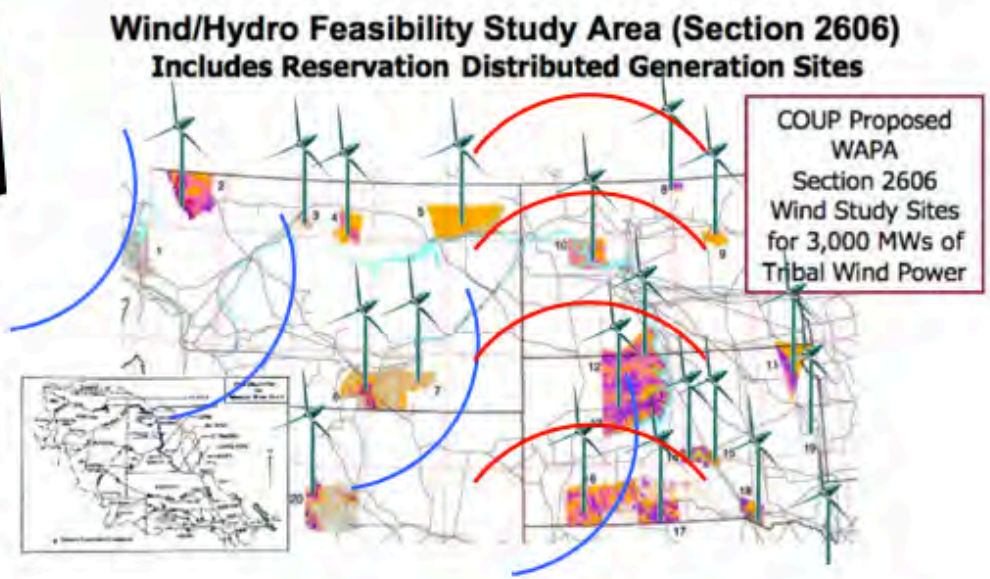
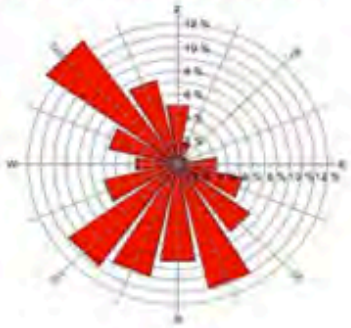
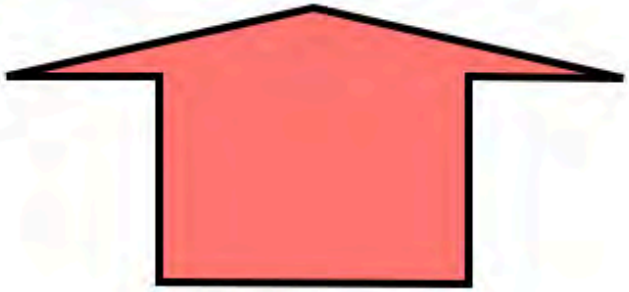
PREVAILING WIND DIRECTIONS





WIND DIRECTION
AND FREQUENCY





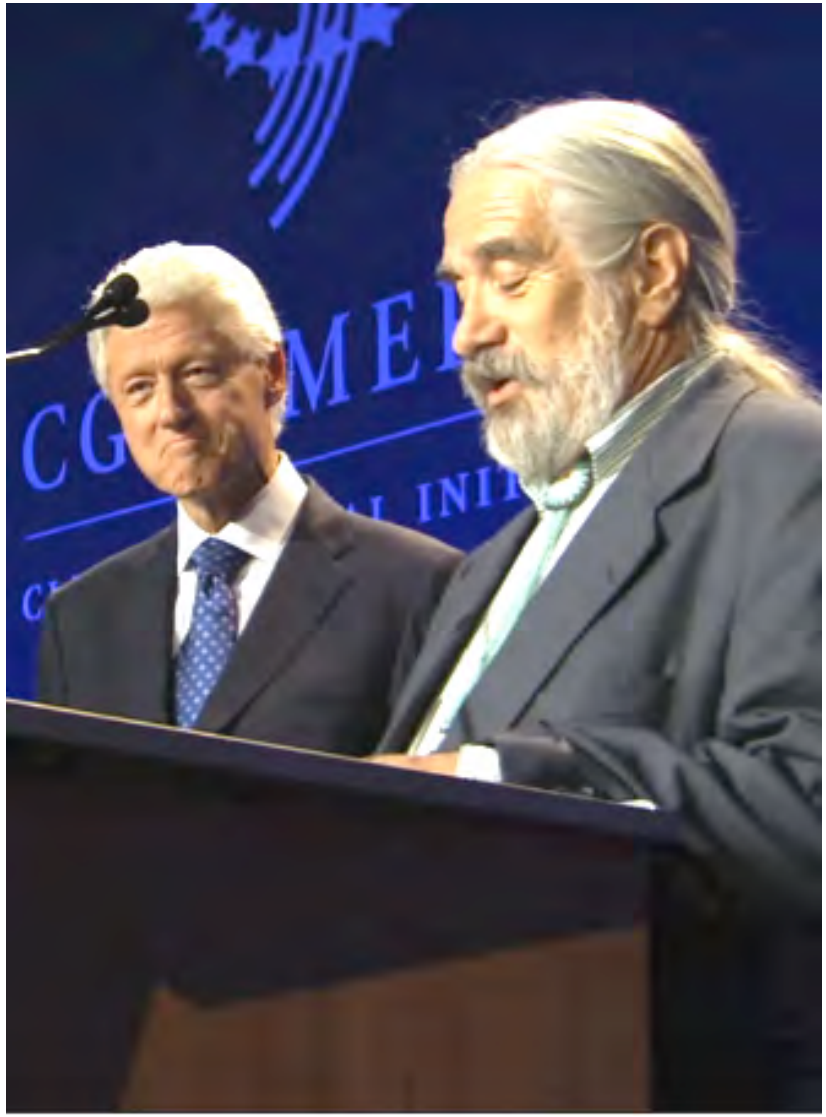
It's not the WIND that is *intermittent,*

… it is our collection system!!

THE TASK AHEAD:
The Next Energy Economy
A CLEANER, LESS COSTLY ENERGY MIX

CLINTON GLOBAL INITIATIVE - AMERICA

The **Clinton Global Initiative-America** has taken a deep interest in working with Indigenous Communities on a variety of issues including:



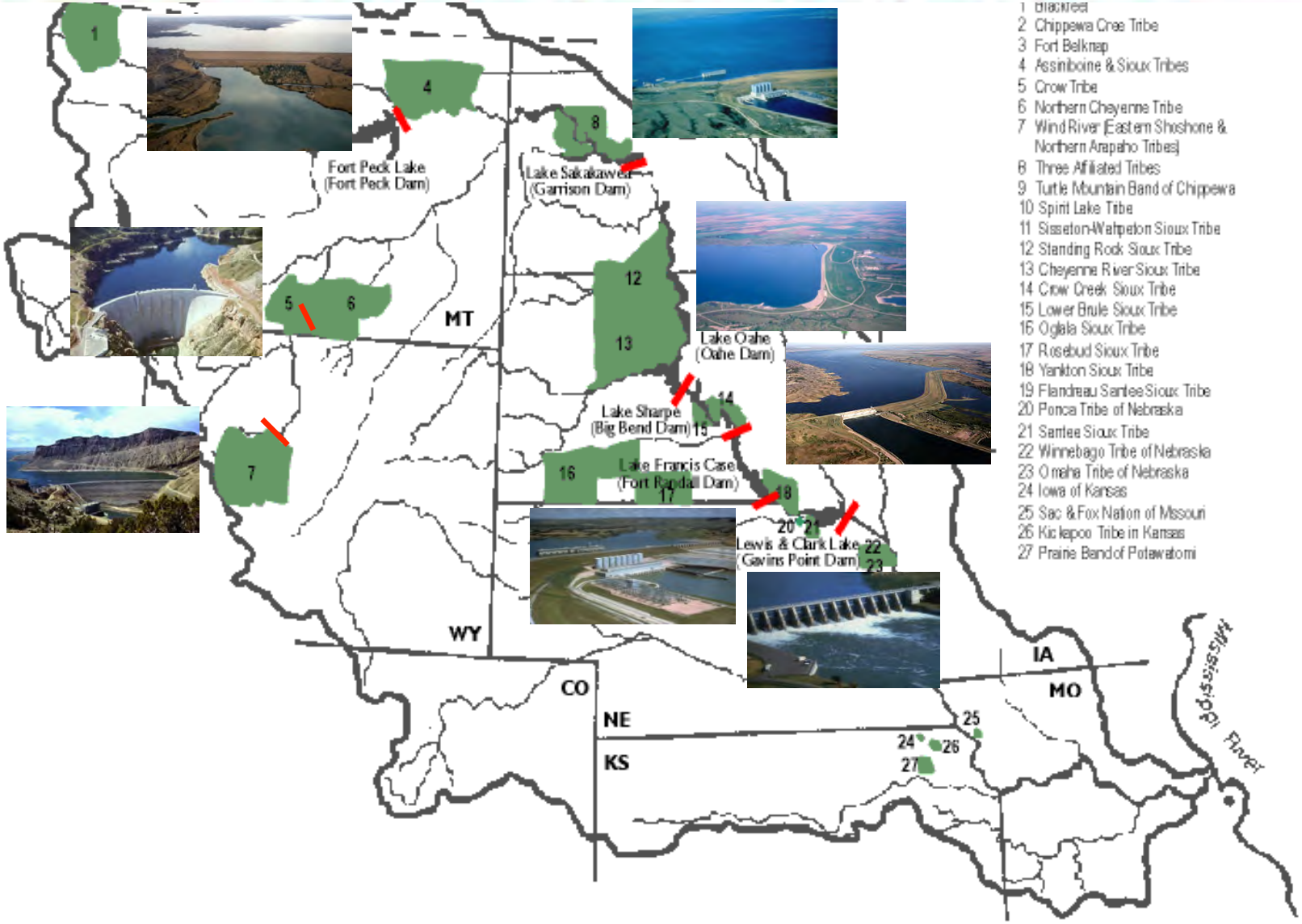
- The Modern Grid
- Renewable Energy
- Sustainable Building
- Workforce Development

Intertribal Wind Development Commitment at Clinton Global Initiative-America 2013

Dammed Indians on the Missouri River

Native Peoples Native Homelands

INTERTRIBAL Council On Utility Policy COUP



1 Blackfeet
2 Chippewa Cree Tribe
3 Fort Belknap
4 Assiniboine & Sioux Tribes
5 Crow Tribe
6 Northern Cheyenne Tribe
7 Wind River (Eastern Shoshone & Northern Arapaho Tribes)
8 Three Affiliated Tribes
9 Turtle Mountain Band of Chippewa
10 Spirit Lake Tribe
11 Sisseton-Wahpeton Sioux Tribe
12 Standing Rock Sioux Tribe
13 Cheyenne River Sioux Tribe
14 Crow Creek Sioux Tribe
15 Lower Brule Sioux Tribe
16 Oglala Sioux Tribe
17 Rosebud Sioux Tribe
18 Yankton Sioux Tribe
19 Flandreau Santee Sioux Tribe
20 Ponca Tribe of Nebraska
21 Santee Sioux Tribe
22 Winnebago Tribe of Nebraska
23 Omaha Tribe of Nebraska
24 Iowa of Kansas
25 Sac & Fox Nation of Missouri
26 Kickapoo Tribe in Kansas
27 Prairie Band of Potawatomi

Feasibility of Integrating Tribal Wind and Federal Hydropower

Federal-Tribal Participants in Section 2606:
Tribal Wind - Federal Hydropower Feasibility Study

U.S. Department of the Interior
March 3, 1849

U.S. Department of the Interior
Bureau of Reclamation

Department of Defense
United States of America

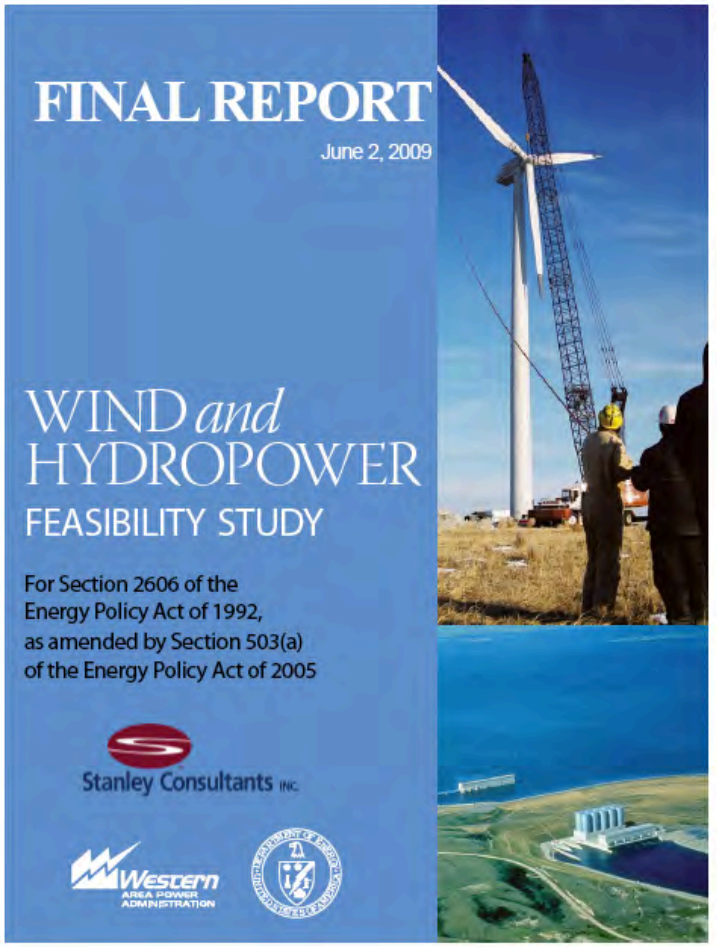
US Army Corps of Engineers®

Department of Energy
United States of America

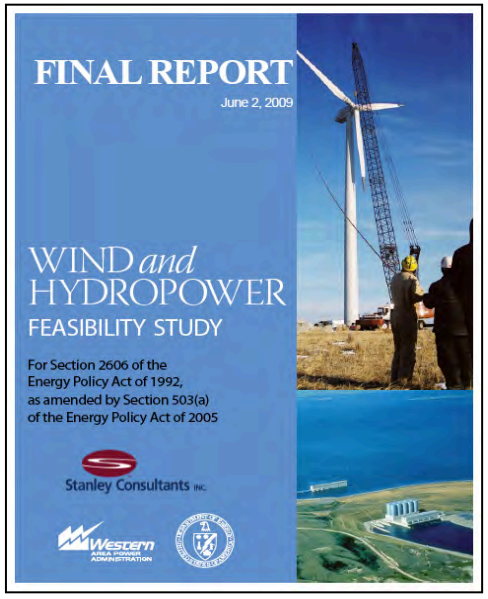
Western Area Power Administration

InterTribal COUP
Council On Utility Policy
Building Sustainable Homeland Economies
P.O. Box 25, Rosebud, SD 57570
IntertribalCOUP.org

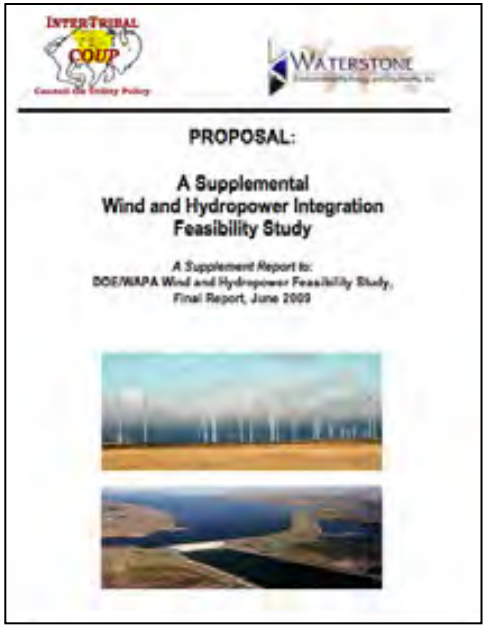
Environmental Justice



NEEDED: Follow-Up to DOI/DOD/DOE Section 2606 Study
Supplemental Wind-Hydropower Integration Feasibility Study

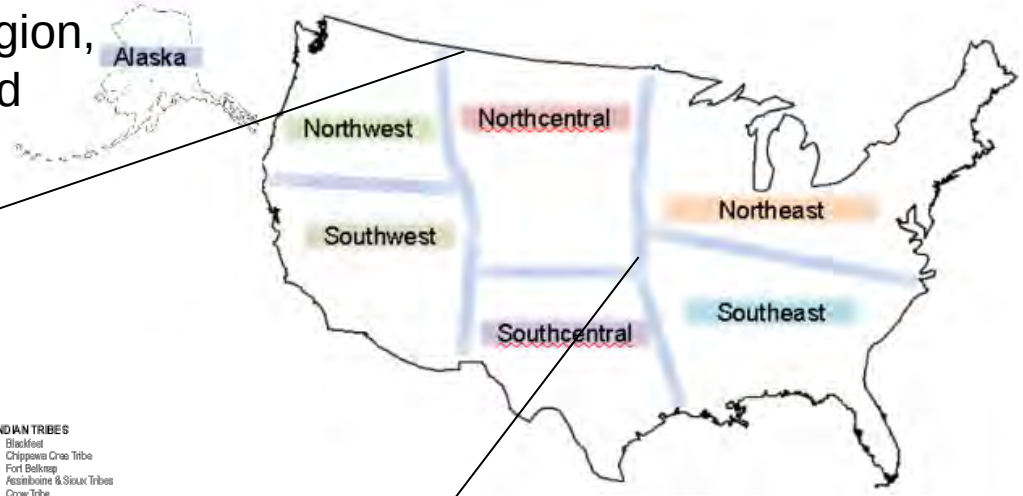


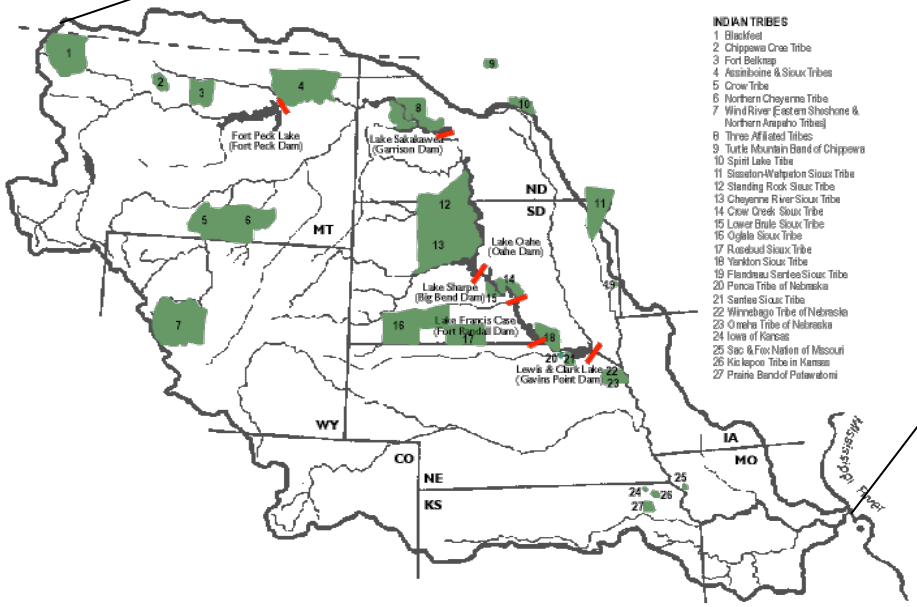
Supplemental Study Needed



DOI Climate Science Centers (CSC)

The Interior Department is establishing a series of Climate Science Centers, including one in the North Central region, to help federal, state, local, tribal, and private sector decision-makers understand changes from various environmental stressors and plan in ways that reduce economic and ecological impacts.

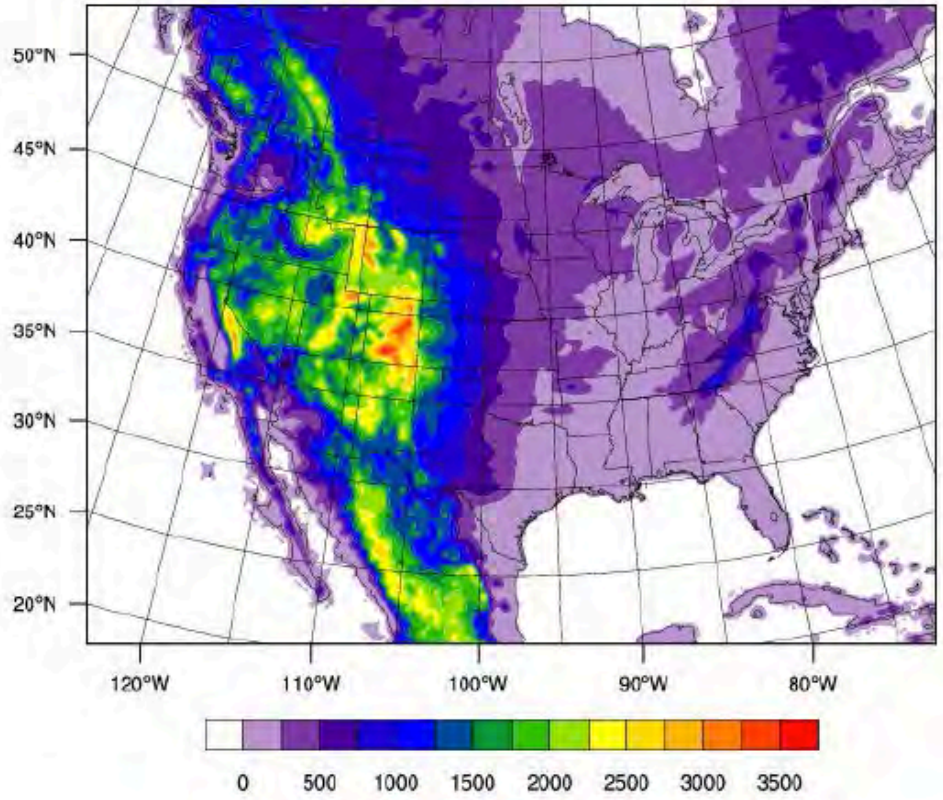




A 30 Year Prospective Climate Assessment of the Missouri River Basin would provide an excellent baseline for the North Central Climate Science Center.

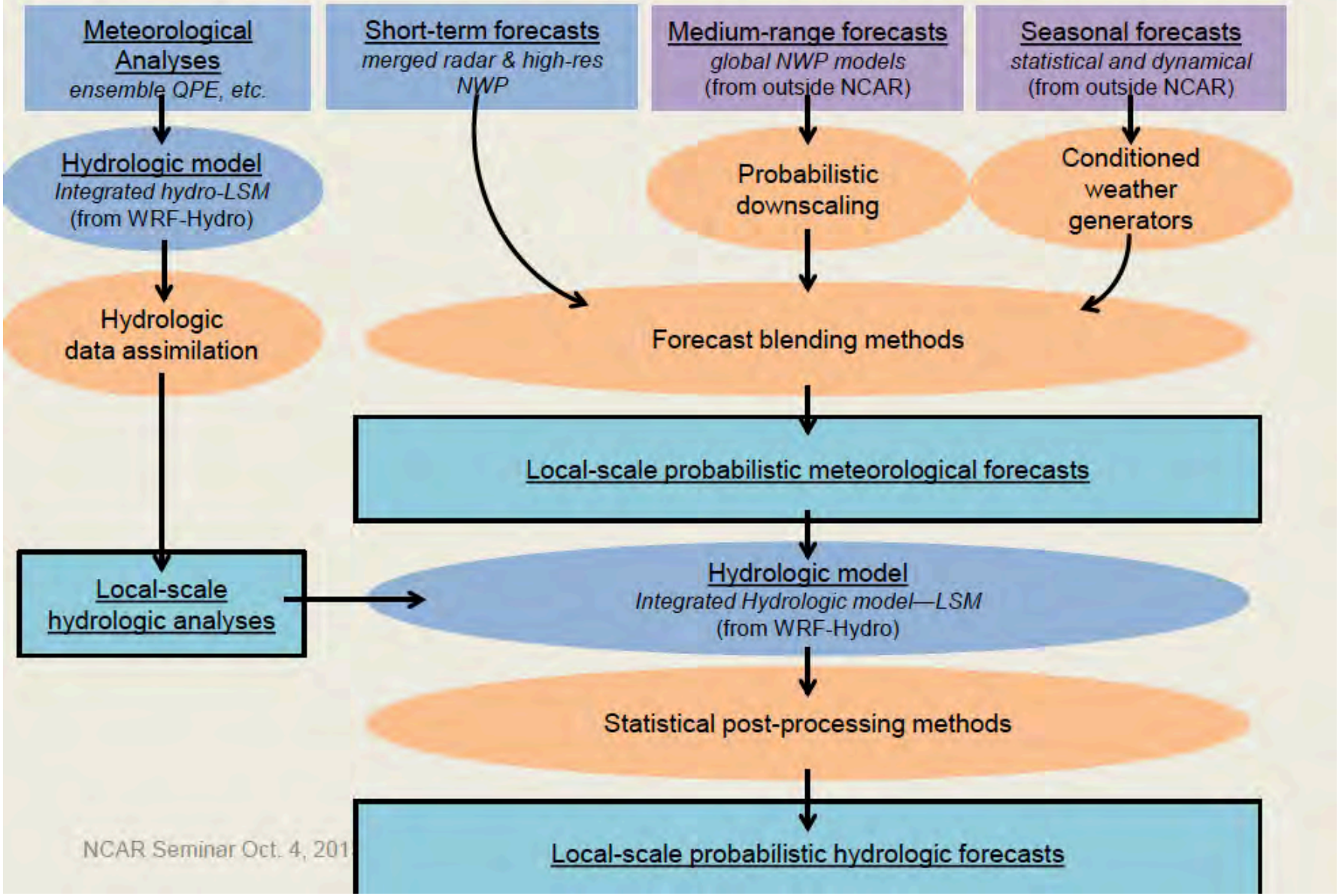
Global Energy & Water Exchanges (GEWEX)

High resolution simulations of North America with WRF and WRF-Hydro for current and future climate



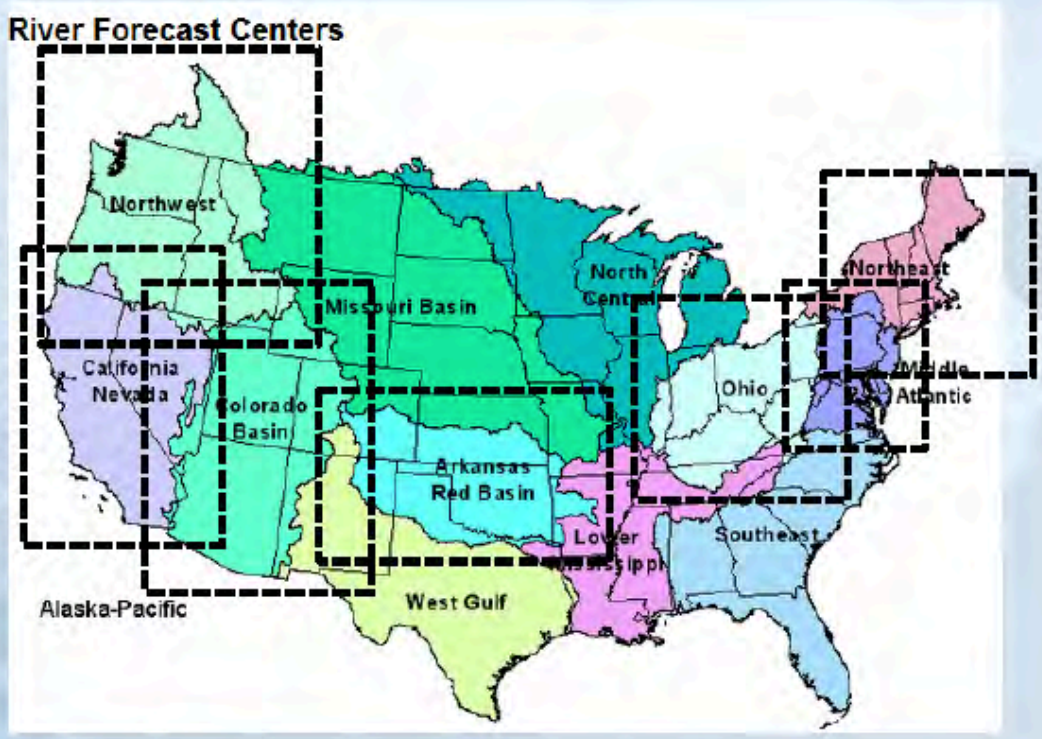
(276 x 208 grid points)

Minutes to Seasons Forecast System

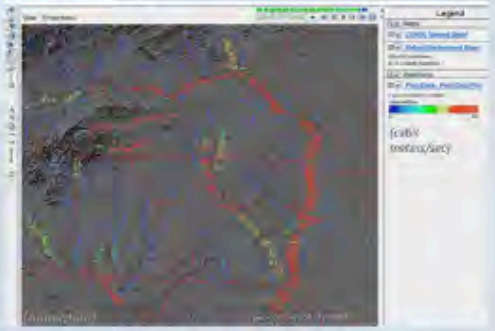


WRF-Hydro Experiments - FY14

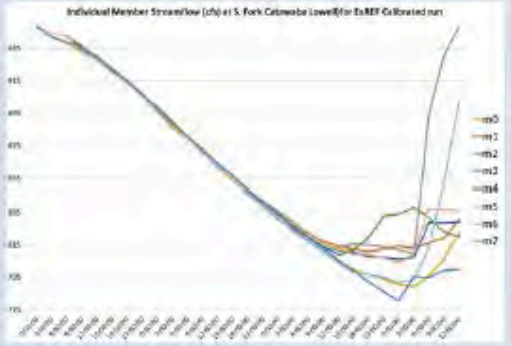
- Implement individual instantiations of WRF-Hydro system over all 13 NWS River Forecast Center domains
- Enhance capabilities in WRF-Hydro to deal with more water management (reservoirs, diversions and augmentations)
- Enhanced pre- and post-processing tools for streamlined execution and product generation



Spatial streamflow products



Ensemble QPF-based Streamflow Predictions



What Departments and Agencies Might Benefit from A 30 Year Climate Assessment of the Missouri River Basin?

Agriculture

Commerce

Defense

Energy

Interior

Transportation

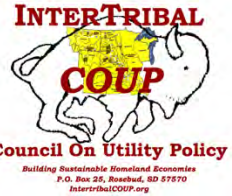
EPA

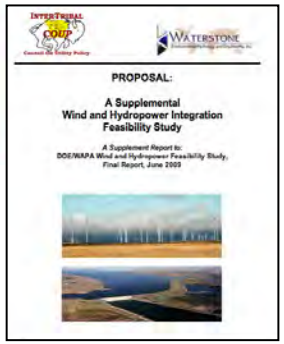
Govt Services

NASA

Homeland Security

Tribes

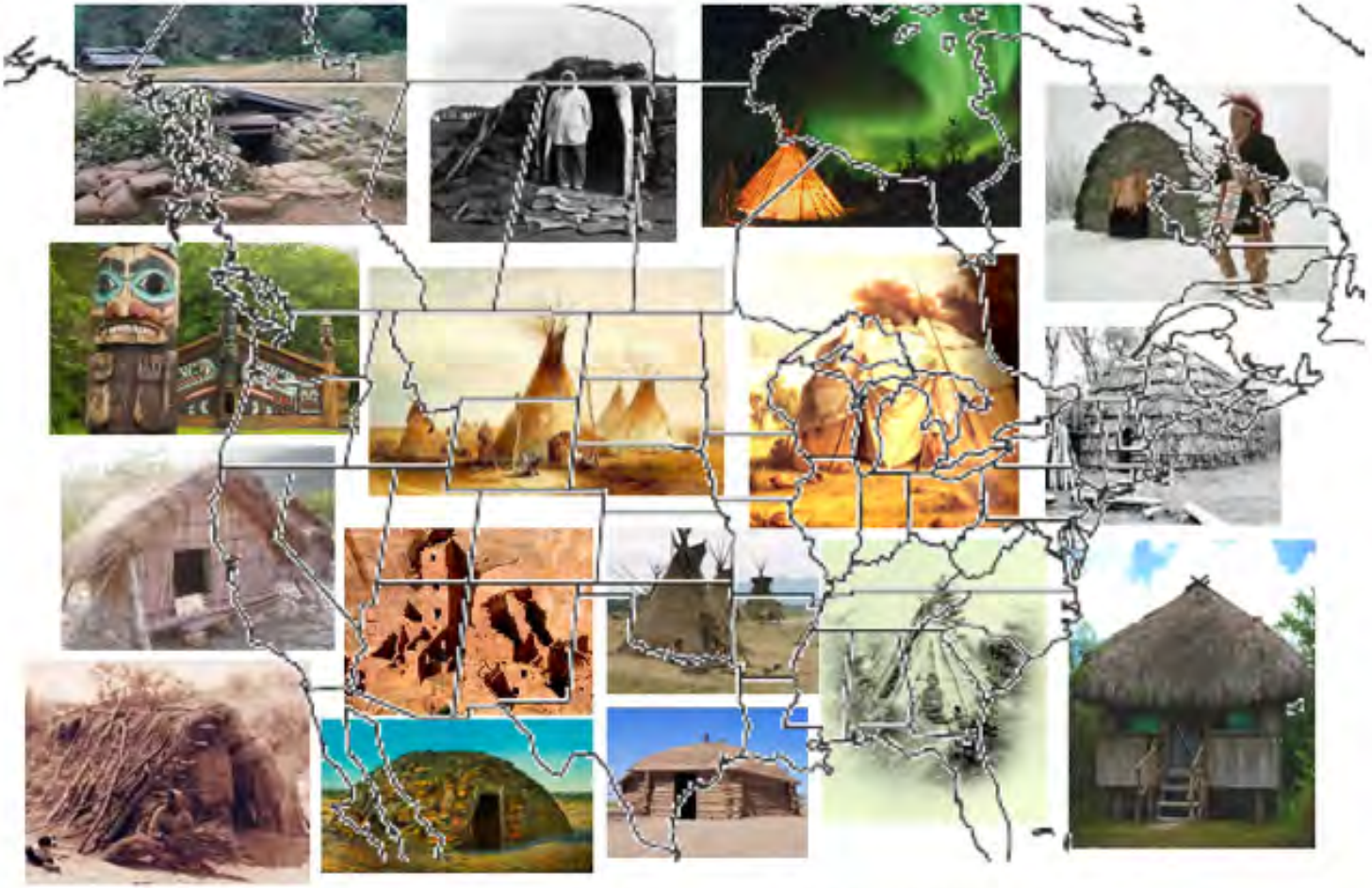




INTERTRIBAL Council On Utility Policy COUP

Native Cultures are Seasoned Cultures

"Seasoned" means "rendered competent through trial and experience"



Over 40,000 Years of Natural Building Experience.

Native Peoples Native Homelands

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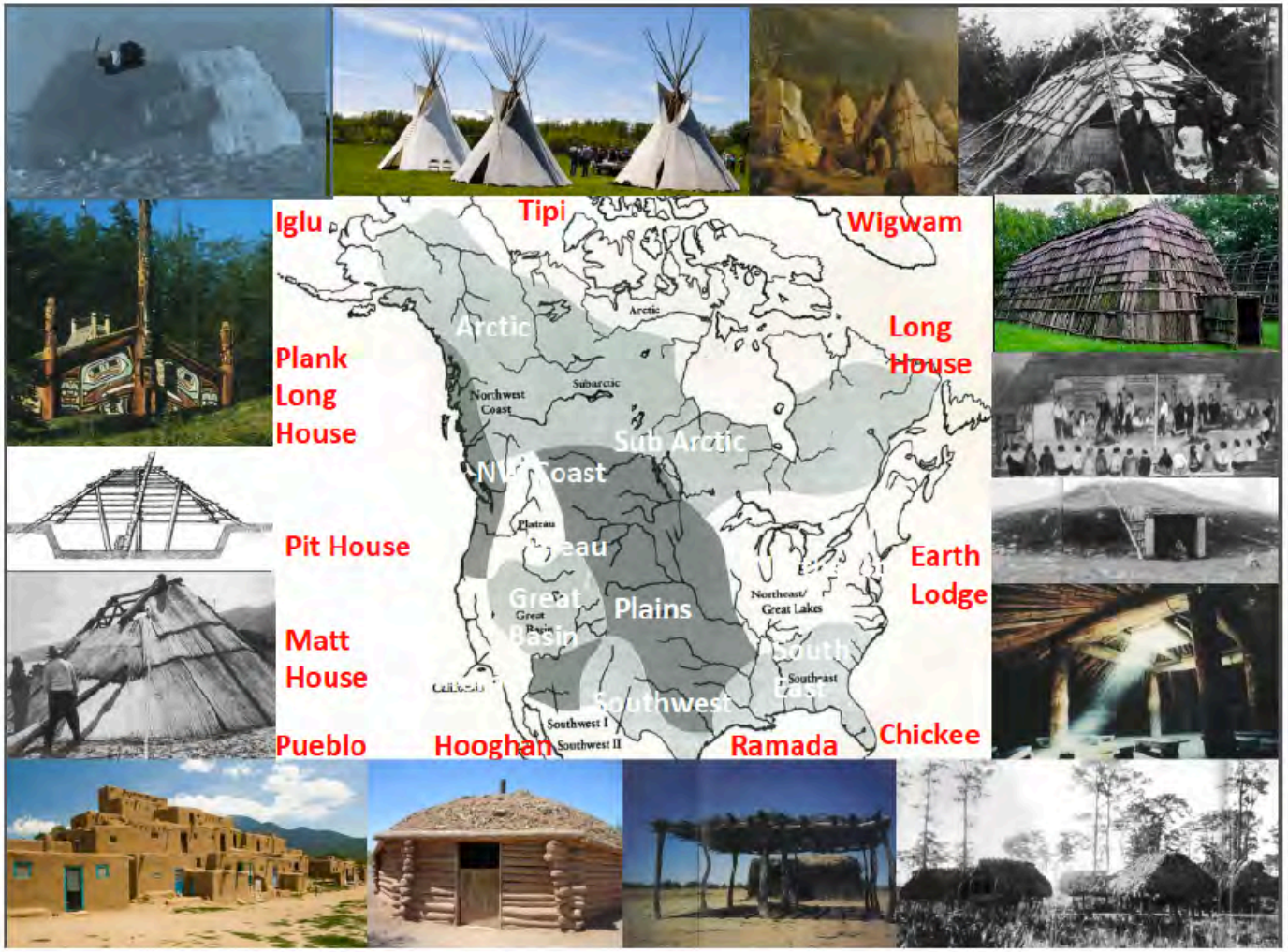

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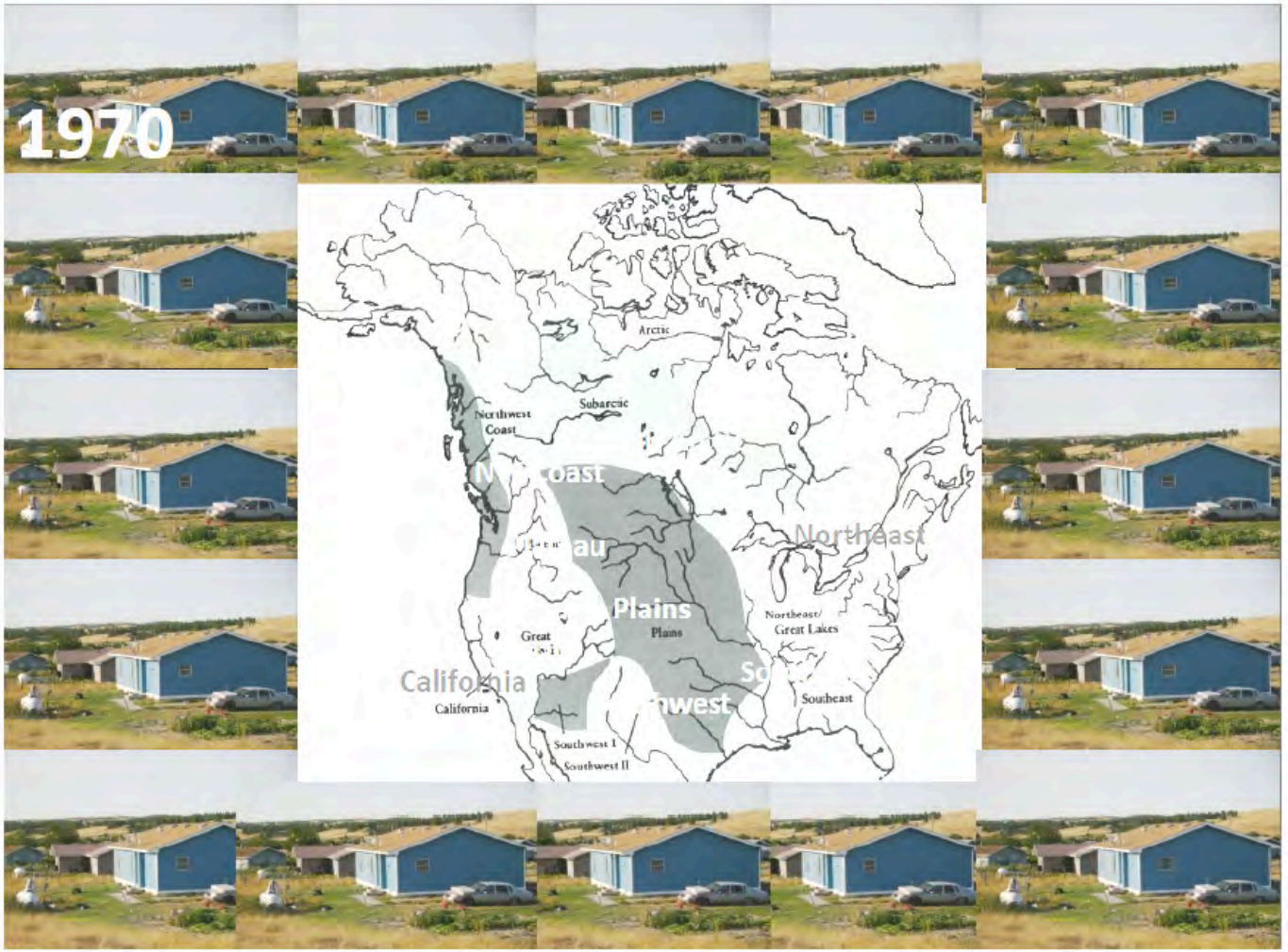


Tribal Resilience in the Face of Climate Change: SAFE™ Homes and Distributed Generation

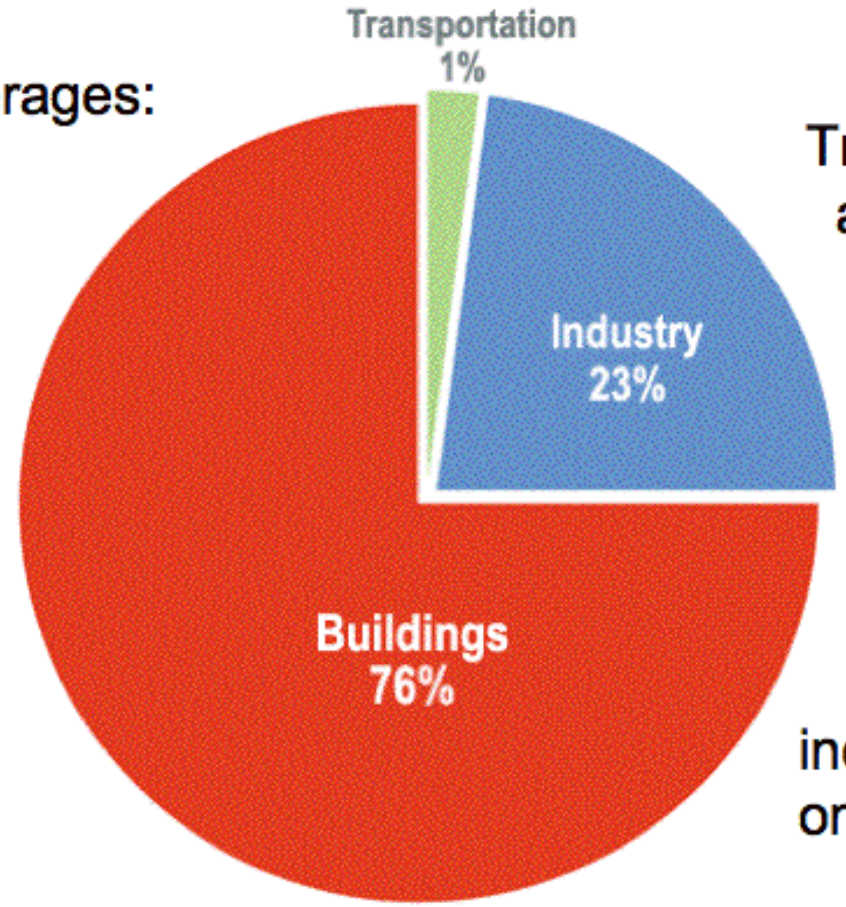
Traditional subsistence cultures, based upon hunting, fishing and gathering, are the first and worst hit by the impacts of global warming, because these cultures depend upon intact habitats that are disrupted by climatic change.

Contemporary tribal communities are seeking ways to build greater resilience and are working to both mitigate the causes of climate change by the reduction of green house gas emissions and adapt to the accelerating changes that are being presently experienced.

Intertribal COUP is working to achieve both visions to prepare Indian Country for a more resilient future in the face of climate change.

Where does our electricity go?

National Averages:



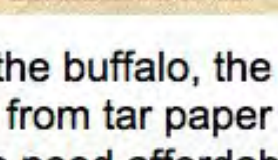
Tribal Averages are likely to be more greatly weighted towards residential buildings, given the overall lack of industry present on reservations.

Disaster Relief Housing

Tribal Energy Development from the19th to 21st Century

For Centuries on the Great Plains
Native Peoples Transformed
The Gifts of the Buffalo
Into Homes and a
Way of Life …







Today, Tribes
Look to Affordable
And Efficient Homes of Local,
Natural Materials and to Renewable Energy
As a Sustainable Path for the Generations to Come

After the buffalo, the history of Indian housing has been one of sequential disaster relief, from tar paper shacks, to inefficient HUD homes and now to FEMA trailers. Tribes need affordable, healthy homes for very young and growing populations.

Tribal Housing Issues

The Short List

- Huge housing deficit (over 1/2 million nationwide)
- Sub-standard and aging housing
- Funding doesn't match need for new construction
- Funding doesn't match need for energy assistance
- Energy prices volatile and rising
- Severe mold issues
- Growing population
- Unemployment
- Rising building material costs and transportation costs
- Water scarcity
- Lack of ecologically sustainable designs
- Lack of culturally appropriate designs

REZ INTENSIVE CARE UNIT

Our Housing Stock is on Life Support

Inspired by Randy Udall, CORE; Realization by Bob Gough

Native Peoples Native Homelands

INTERTRIBAL Council On Utility Policy COUP

Tribes Building Sustainable Homeland Economies

Sustainable **AF**fordable **E**fficient

SAFE Homes

Capital Cost + Operating Cost = Affordability

Mass + Insulation = Comfort

GreenWeaver

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**

Home on the Range

(or in the Solar Oven)

on Great Plains

Seasonal Temperature Swing of 150 Degrees

Summer Highs — **120° F**

Human Comfort Range — **80° F** / **60° F**

Winter Lows — **-30° F**

TRIBAL SUSTAINABLE ENERGY DEVELOPMENT

19th AND 21st CENTURY MODELS

Natural, Sustainable, Affordable and Efficient Homes




Built on a Base of Renewable Energy Resources

OPTIMIZING AND EXTENDING RESOURCES

Standard Log House
Logs Per House: 50 to 60

The number of 24 ft logs in a single Log House (1) could be used to build up to six (6) Post and Beam Straw Bale Houses each with at least twice as much insulative capacity.

Straw Bale House
Logs Per House: 10 to 15

Straw Bale building technology can help close the over 200,000 housing deficit in Indian Country by providing quality sustainable, affordable and energy efficient homes and creating local green collar jobs with the use of local, natural materials.

Conditions Are Ideal for Using Strawbale for Building Construction on Many U.S. Indian Reservations

- Semi-arid climatic conditions on Northern Great Plains are ideal for construction and long-term maintenance of strawbale buildings
- Great Plains Reservations are located in rural North American pasture & grain belt (Strawbale construction techniques originally developed in Nebraska)
- Seasonal temperature swings of over 150 degrees F require housing designed for significant heating and cooling to maintain acceptable levels of comfort

Intertribal COUP held a series of Tribal housing charettes in North and South Dakota developing straw bale and stick built conceptual designs.

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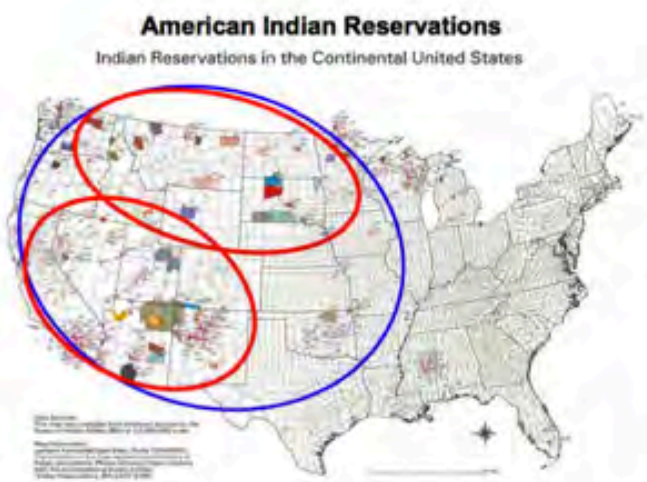
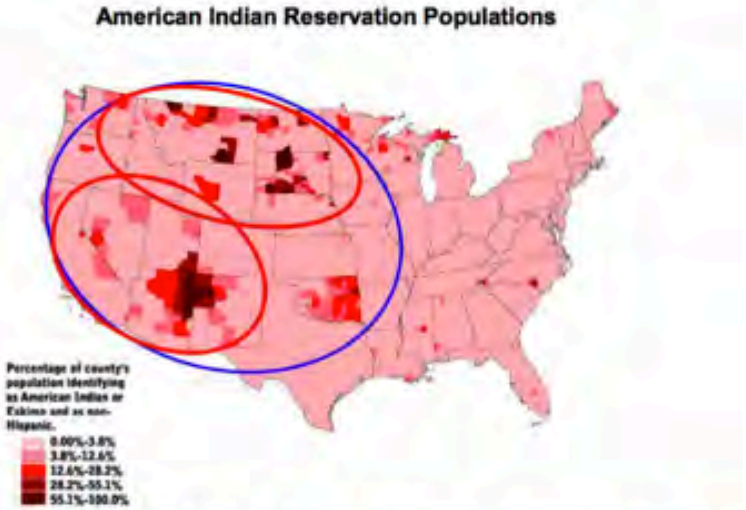
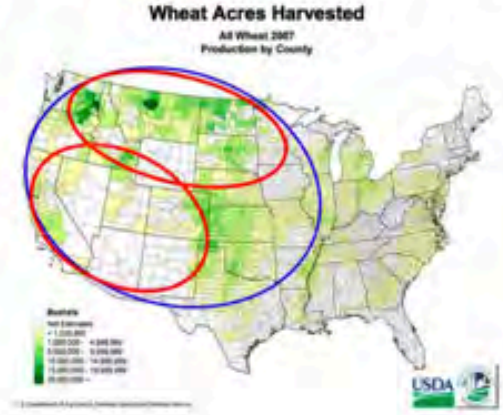
INDIAN RESERVATIONS



RESERVATION POPULATIONS



STRAW RESOURCES ARE RELATIVELY ABUNDANT IN OR NEAR INDIAN COUNTRY



TRIBAL COLLEGE / VOTECH TRAINING

Development Of Tribal College and University Training Courses for Reservation Job Creation and Employment

The Oldest and Newest Straw Bale Houses In South Dakota

Built in 1921 in southern Todd County, SD

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

… Both on the Rosebud Sioux Indian Reservation

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Sustainability in Housing ~ 2009/10

Straw Bale Building Initiative: Tatanka Oti

Buffalo Lodge Project for Tribal College Faculty & Students

Sinte Gleska University ~ Antelope Campus Rosebud Sioux Indian Reservation

Developed By

Intertribal Council On Utility Policy (COUP)

GreenWeaver Inc ~ Straw & Timber Craftsmen

Environmental Design Partners ~ One World Design Architecture

Development Center for Appropriate Technology ~ 3DE

Sinte Gleska University

Institute of Technologies ~ Buffalo Ranch Program ~ Art Institute

Oglala Lakota College Applied Science General Construction

United Tribes Technical College

American Indian Higher Education Consortium

Rosebud, Oglala, Turtle Mtn., Ft. Berthold, Flandreau Sante, Lower Brule, Yankton

With Support From

DOI ~ Office of Indian Energy and Economic Development

Rosebud Sioux Tribe ~ Sinte Gleska University ~ Intertribal COUP

DOE-TEP ~ Friends' PYM Indian Committee (Quakers) ~ UNCF

South Dakota Community Foundation ~ Greiner Family Foundation

COSBA ~ Untours Foundation ~ USDA-RC&D ~ Solar Energy International

BUFFALO LODGE
Tatanka Oti

TRIBAL COLLEGE / VOTECH TRAINING

Development Of Tribal College and University Training Courses for Reservation Job Creation and Employment

PRESENT FUNDING STREAMS INTO INDIAN COUNTRY

LIHEAP FUNDS = **$4.5 M/08**
NEW RENEWABLE ENERGY FUNDING = UNDER **$3 M/YR**

PRESENT INDIAN HOUSING FUNDING = **~$650 M/YR**
NEW HOUSING = **$260 M/YR**

Near all of these meager energy funds leave for the purchase of off-reservations fuels or technology.

Most of these tribal housing funds quickly leave the Reservations for materials or prefab houses and labor.

$ $

$ $ $

PRESENT FUNDING STREAMS INTO INDIAN COUNTRY

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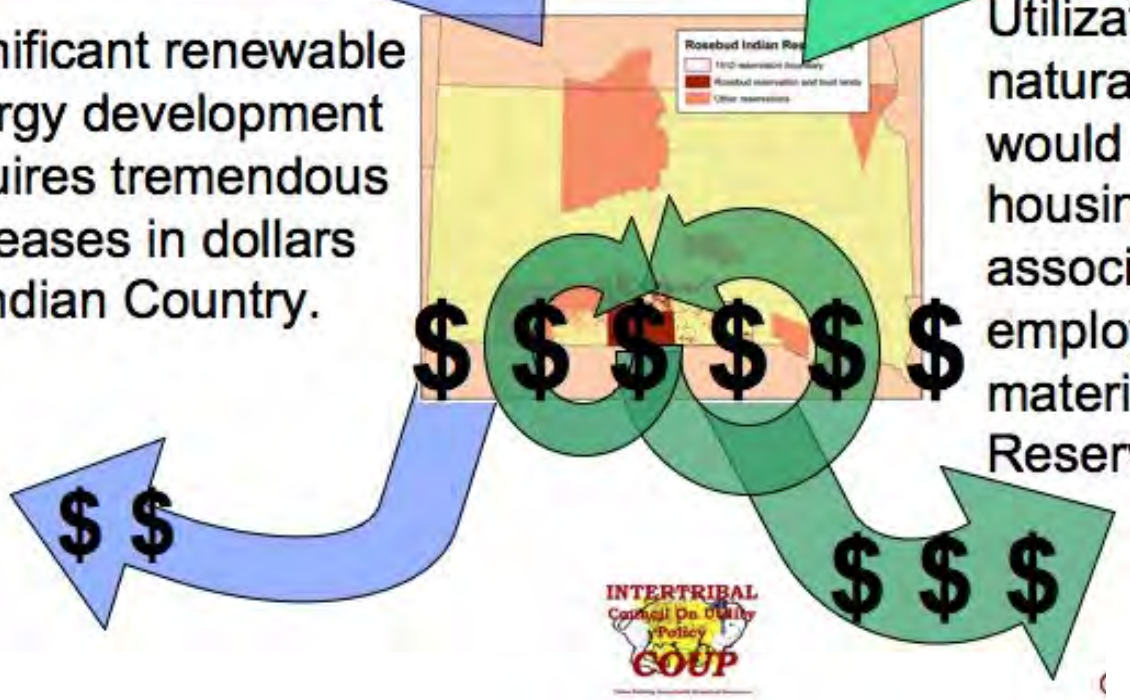
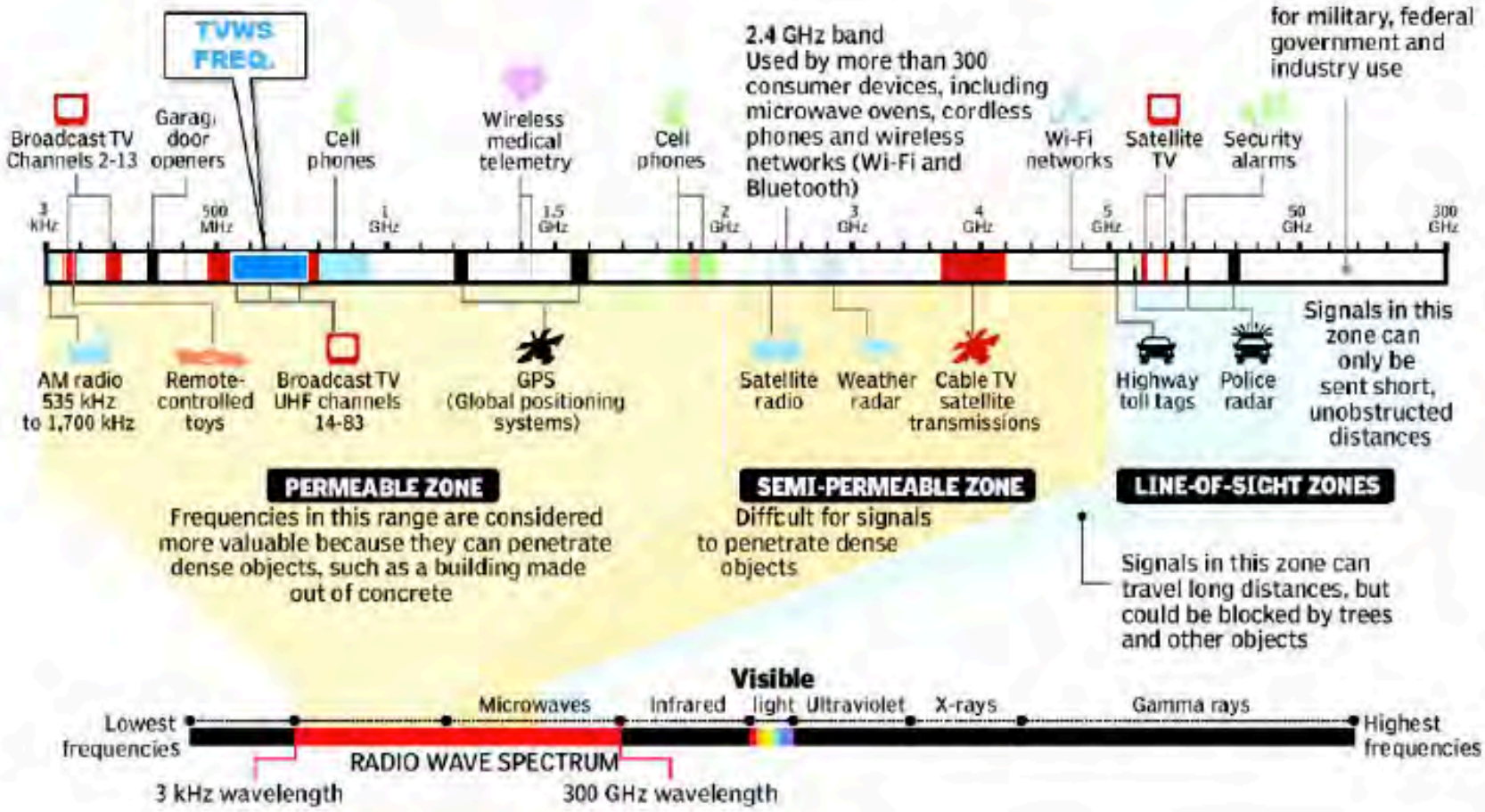
Significant renewable energy development requires tremendous increases in dollars to Indian Country.



Utilization of local, natural materials would keep more housing dollars associated with employment and materials on the Reservations.

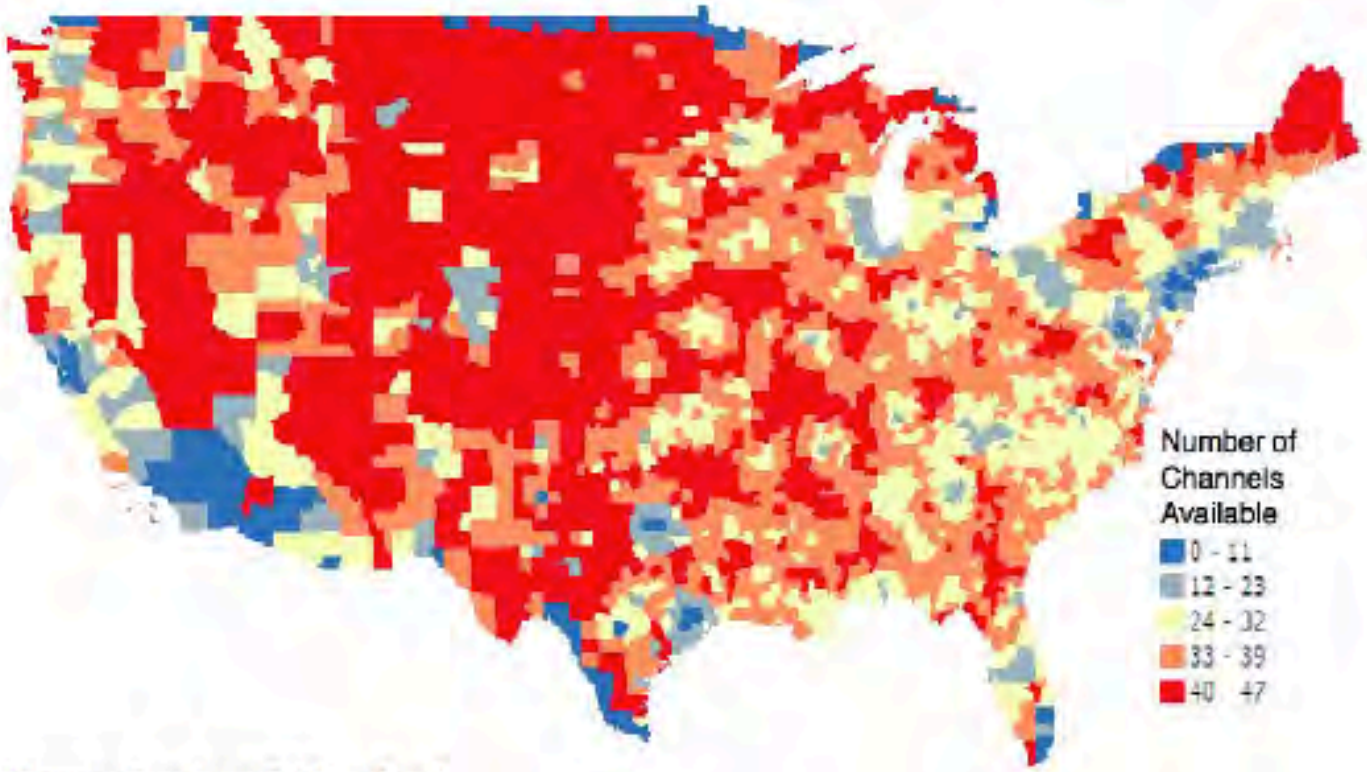
SPECTRUM USAGE MAP:

This chart explains the usage model for radio wave spectrum in general, and the positioning of TVWS spectrum within this model.



Mass Market Exodus to Upper Area Spectrum:

Over the last 10 years, the market has witnessed a dramatic transition of consumers away from the lower-end spectrum of over-the-air receipt of content via broadcast television, cable television, and radio, and a move to upper-end spectrum for smartphone and notepad connectivity services. In a vast majority of U.S. regional area markets, the majority of lower end frequencies assigned for TV broadcasts are no longer used for over-the-air content. This map shows the number of available (unused) full VHF and UHF channels in regional areas across the United States.



(Source SpectrumBridge, Inc.)

UNLIMITED APPLICATION POTENTIAL:

In April of 2012, Julius Knapp Chief of the FCC's Office of Engineering and Technology ("OET") released a slide show presenting the FCC's views on the potential of SWF spectrum. This slide is an excerpt from this presentation. This slide serves to affirm the FCC's position on the ability of SWF spectrum to become approved for every possible form of usage.

Potential Applications

Provides a new opportunity for innovation and delivery of service, with potential for both research and commercial applications

Spectrum is open to everyone & and is available now

- Broadband (generally)
- Rural broadband
- Video – Monitoring, surveillance, distribution
- State & Local Governments
- M2M
- Smart Grid
- Health Care
- Education
- Data traffic off-load

Potential uses limited only by the imagination

Super Wi-Fi Longer Distance Coverage Range:

Regional areas can be covered with signal saturation by our Super Wi-Fi networks with far fewer towers than necessary for Wi-Fi or WiMax wireless systems. The following diagram shows a comparison between a Super Wi-Fi twenty-five mile radius coverage cell network, versus Wi-Fi five mile radius coverage cells. This capability enables national and state scale regional areas to be covered with SWF networks for far less money and at reduced risk.

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Based on renewable wind energy and building affordable, energy efficient housing, using local materials such as straw bales, a sustainable Tribal economy could provide quality jobs and healthy housing for growing reservation populations.

Over one-half of Indian Country is 18 years or younger, and will need both homes and jobs.

Why not *create* good jobs building wind turbines and healthy, affordable, and energy efficient homes?