

# Utilizing Earth Observations To **Protect** and **Sustain** Tribal/Indigenous Cultural Heritage

James Rattling Leaf, Sr. *Sicangu Lakota Oyate*  
September 18, 2020



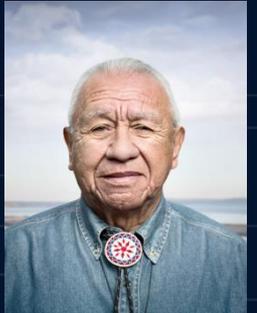
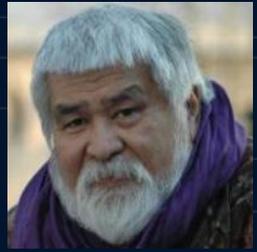
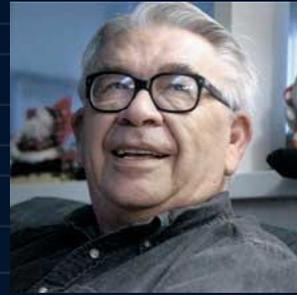
**NEDTalks**

# Introduction



[www.lakhota.org](http://www.lakhota.org)

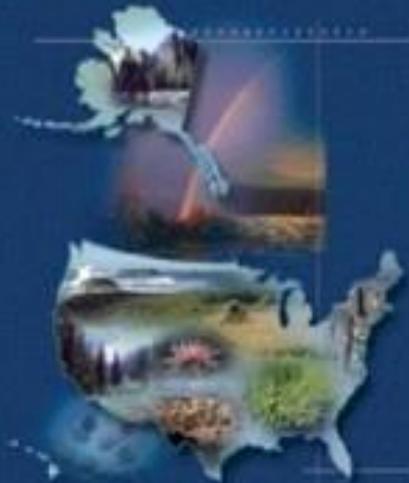
# NEDTalks



# NEDTalks

## Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change

The Collected Works of the 2000 National Assessment

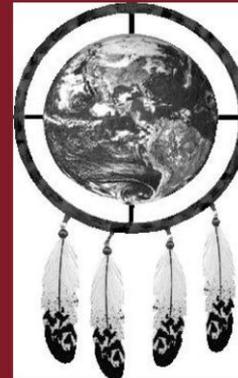


U.S. Global Change Research Program

## NATIVE PEOPLES-NATIVE HOMELANDS CLIMATE CHANGE WORKSHOP

- Final Report -  
Nancy G. Maynard, Editor

CIRCLES OF WISDOM



U.S. Global Change Research Program

OCTOBER 28 - NOVEMBER 1, 1998  
Albuquerque Convention Center  
Albuquerque, New Mexico

Sponsors:  
The National Aeronautics and Space Administration  
American Indian Chamber of Commerce of New Mexico  
City of Albuquerque

## NEDTalks



- “Sinte Gleska University was started by its founding fathers...to strengthen the Sicangu (Rosebud) Nation in all aspects of life. As such, this initiative will assist us in bringing two of the essential points of life, the sky and the earth, together spiritually and technically.”

**Dr. Lionel Bordeaux, President,  
SGU**

# NEDTalks

## Upper Midwest Aerospace Consortium Delivering Information from Space to the Public

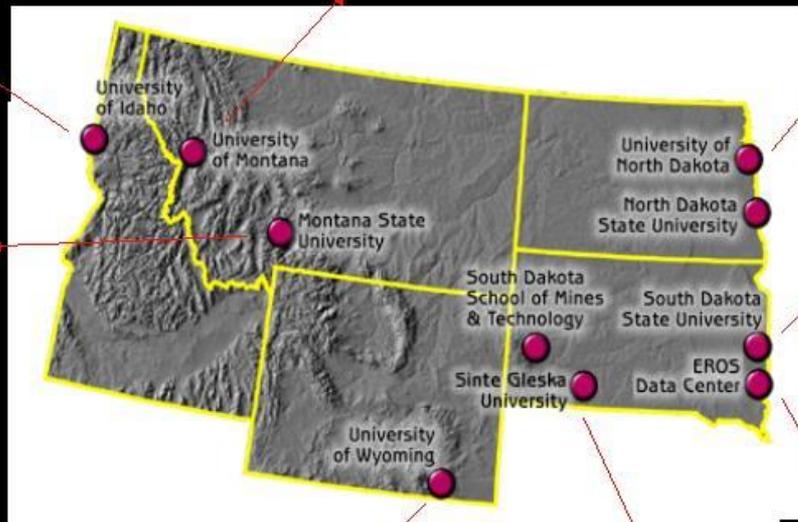
USFS Region 1

USFS Fire Sciences Lab

Potlatch  
Corporation  
Boise Cascade  
Plum Creek  
Timber Co.

Precision  
Agriculture  
Research  
Association

Montana  
Watershed Inc.  
Triangle  
Agriculture –  
Services, LLC  
Yellowstone  
National Park



K-12 Education  
The Nature Conservatory  
BLM  
Wyoming Cattlemen's  
Association

Rosebud  
Sioux  
Reservation

Manitoba – North  
Dakota Zero-Tillage  
Association

American Crystal  
Sugar

Dakota Pasta  
Growers

Spring Wheat  
Bakers

Prairie Public TV

National Education  
Television  
Association

Fort Berthold  
Indian Reservation

SD Precision  
Agriculture  
Association

Satellite and  
aerial data



# NEDTalks



Memorandum of Understanding  
October 2000

**Wolakota - A new way of doing business**



**SGU-USGS MOU Highlights  
(2000-2006)**



October 4, 2000 - SGU President, Lionel Bordeaux (seated left) signs the J-USGS MOU as former USGS Director Chip Groat awaits his turn to sign.



## Rez Mapper

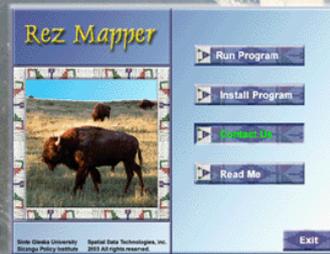
A Geo-spatial/temporal Information System with a Vision:

An ability to integrate, view and apply  
USGS Topo Maps, Satellite Imagery,  
Aerial Photographs, Digital Ortho Quads  
with Lakota Data

for:

Lakota Cultural Resource Management  
Reservation Land Use Determination  
Community Growth and planning

*"Unci Maka nahan Wichapi Oyate nahan Wamakaskan Oyate  
wolakota glusutapi."*

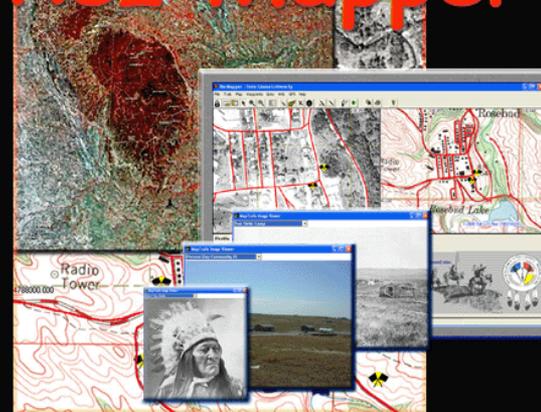


[jamesr@sinte.edu](mailto:jamesr@sinte.edu) or [www.spatialdatatech.com](http://www.spatialdatatech.com)

NASA/Black Hills from Space 2003

R  
E  
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A  
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P  
E  
R

## Rez Mapper



Interactive Community Mapping Program  
for the Rosebud Lakota Nation

*"Unci Maka nahan Wichapi Oyate nahan Wamakaskan Oyate  
wolakota glusutapi."*

Sinte Gleska University, Sicangu Policy Institute

# NEDTalks

RezMapper - Sinte Gleska University

File Trails Map Waypoints Goto Web GPS Help

100.907 100.904 100.908 100.898

43.142 43.144 43.138

2978 2981

St Francis

Mission Sch

Water Tank 2998

2990 3000 32

1:24000 Flat SDT Map (1969) NAD83

Aerial Photo 1953

Profile Culture Land Use Growth Communities

Select to goto the community

- Antelope
- Black Pipe
- Bull Creek
- Butte Creek
- Corn Creek
- Grass Mountain
- He Dog
- Horse Creek
- Ideal
- Mika's Camp
- Okreek

Select a community from the list on the left to view that community in the map view.

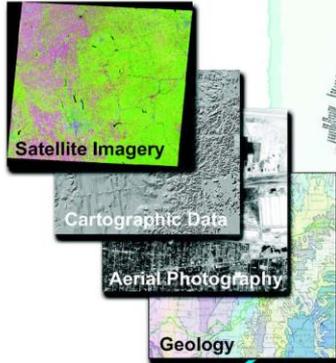
NEAREST TRAIL: NEAREST WP: W -100.91189 N 43.14112 2989 ft.

Start Microsoft PowerPoint - [...] RezMapper - Sinte GL. Help and Support Center MSVDM 12:00 AM

# NEDTalks



## Indian Lands in the United States

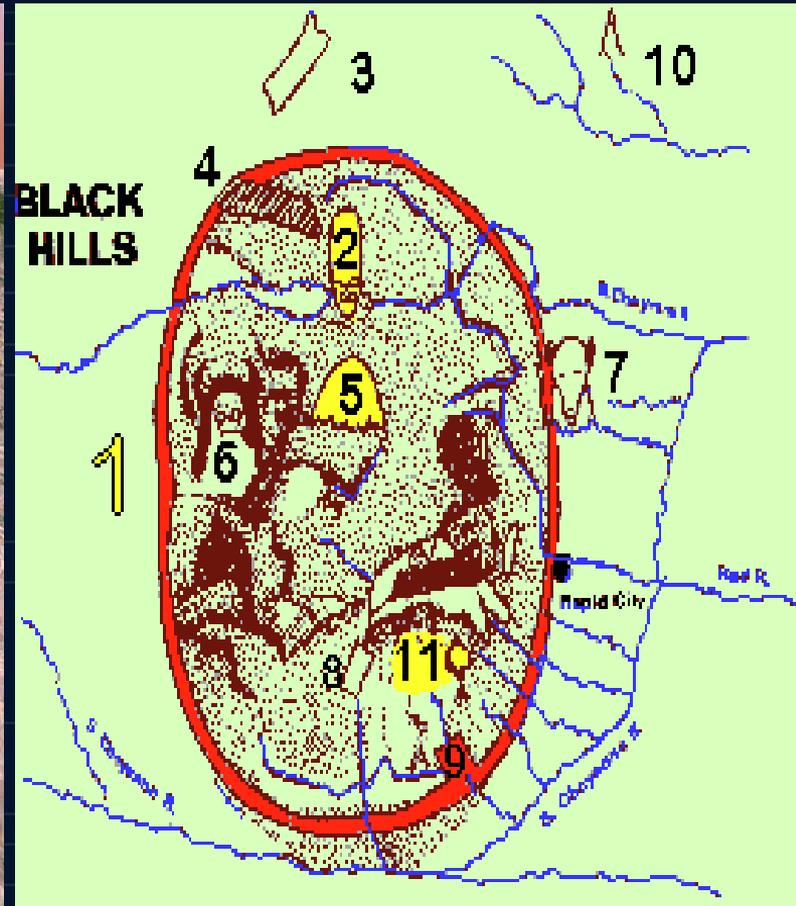


- Applications:**
- ✓ Education
  - ✓ Community Development
  - ✓ Treaty and Trust Responsibility
  - ✓ Economic Development
  - ✓ Natural Resource Management
  - ✓ Cultural Resource Management
  - ✓ Disaster Management
  - ✓ Collaborative Research

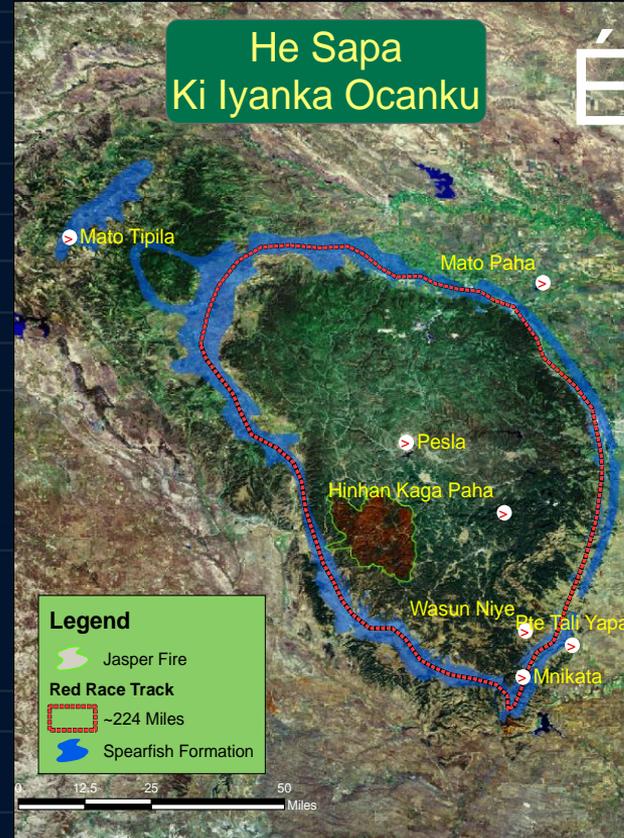
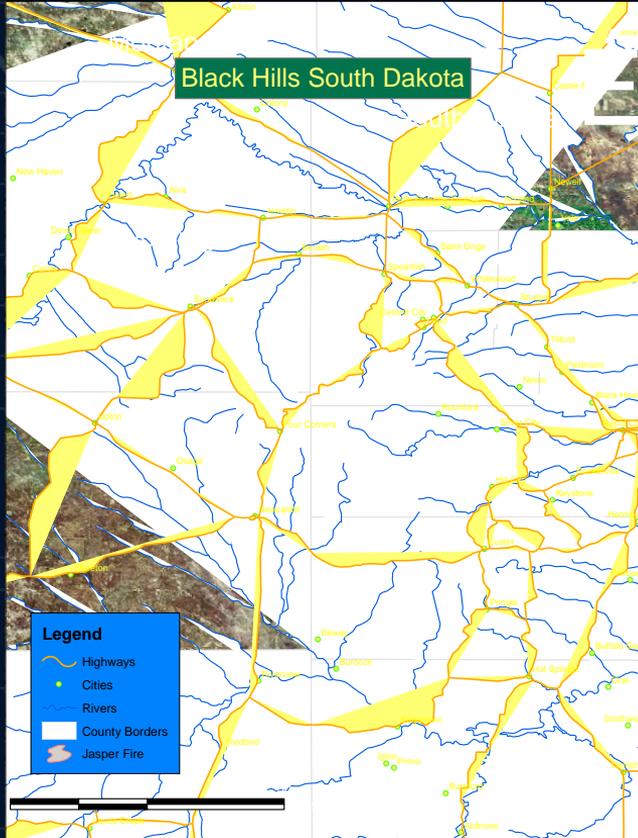
# NEDTalks



- Ki Yanka O Canku** (Race track)
- Mato Tipi Paha** (Devil's Tower)
- Paha Zipela** (Slim buttes)
- Paha Sapa** (Black Hills)
- Pe Sla** (Old Baldy)
- Hinhan Kaga Paha** (Owl Butte)
- Mato Paha** (Bear Butte)
- Mni Kata** (Hot Springs)
- Pte Tali Yapa** (Buffalo Gap)
- Wakiyan Paha** (Thunder Butte)



# NEDTalks



# NEDTalks



## He Sapa Oyate

### A Summer Cultural and Science based Field Experience

**Mato Tipis - Devils Tower**

**Crazy Horse Monument**

**Yankton River**

**Mato Paha - Bear Butte**

**Mount Rushmore**

**Mato Sica - The Badlands**

**Wind Cave National Park**

**Black Hills National Forest**

**Spearhead**

**Waziyata (North)**

**Geoscience Community at the Heart of Everything That Is**

**Waziyata (North)**

**Geoscience Community at the Heart of Everything That Is**

**How to Apply**

The program is organized into a series of four 4-day residential experiential enrichment camps for middle- and high school students, based on the South Dakota School of Mines (SDSM&T) campus in Rapid City. Students may secure a family member to accompany them, and in many residence hall accommodations if they are not from the immediate Rapid City area. The camp experience will include geoscience research experiences, incorporating field exploration and data collection, writing and presentation of results.

**Camp Sessions**  
 Male: June 4 - June 8  
 Female: June 11 - June 15  
 Male: June 18 - June 22  
 Female: June 25 - June 29

For each session, students will arrive the evening of the first day (Sunday) and stay through the following Thursday. Meals and residence hall accommodations will be provided on the SDSM&T campus; in addition each student will receive \$100 stipend.

**How to Apply**

Camps will be limited to 20 students each.

For applications and information please contact:

**Paul Cox**  
 Institute of Atmospheric Sciences  
 South Dakota School of Mines & Technology  
 581 East Sully, Jones B  
 Rapid City, SD 57701  
 Ph: 605-394-2291  
 Email: Paul.Cox@sdsmst.edu

**NSF** **UMMC**



# NEDTalks

## Lakota Language: Lakota Wicowoyake Canku owapi

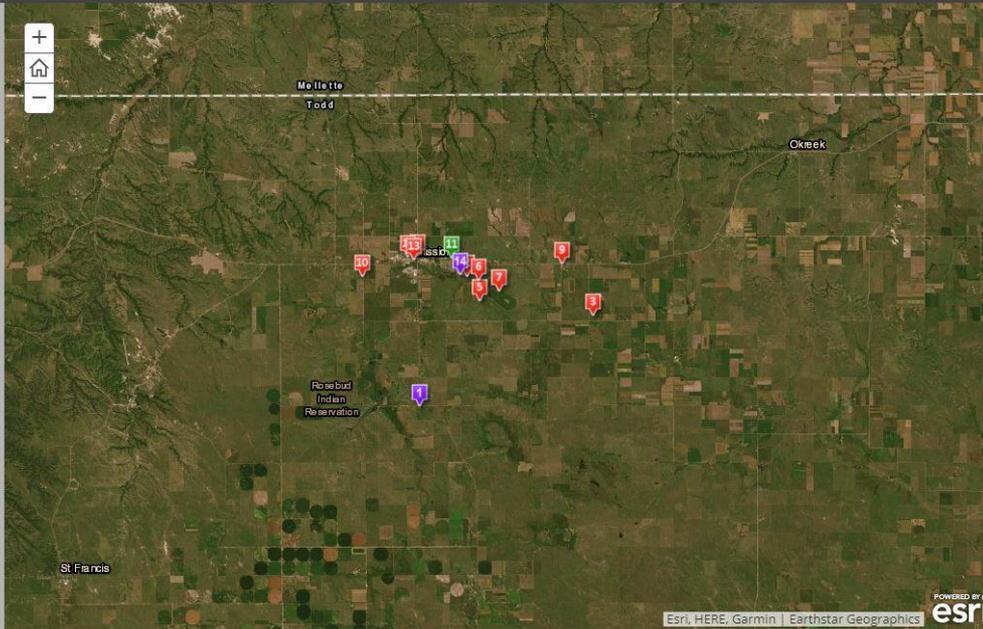
This was created to illustrate how story maps can be used to teach and preserve Native languages.

A story map □ □ □



### Lakota Language: Lakota Wicowoyake Canku owapi Story Map

This story map was created to show how storymaps can be used to teach and learn Native languages. Lakota (also Lakhota, Teton, Teton Sioux) is a Siouan language spoken by the Lakota people of the Sioux tribes. Though generally taught and considered by speakers as a separate language, Lakota is mutually intelligible with the other two languages (cf. Dakota language), and is considered by most linguists one of the three major varieties of the Sioux language. The Lakota language represents one of the largest Native American language speech communities in the United States, with approximately 6,000 speakers living mostly in northern plains states of North Dakota and South Dakota. (Wikipedia)



1 Why care about Native Languages?



2 Lake—ble



3 River—Wakpa



4 Boundary—oicage



5 Hill or Butte—Paha



6 Dam—mininathakapi



7 Tree—Chan



8 Road—canku



9 School—owayawa



10 House—ipi



11 Airport—kinyekhiyapi oinazin



12 Community

# NEDTalks

## Natural Law Conference "Maka Sitomni"

Protecting Water, Land, Air, & Environment through Sovereignty, addressing the Green New Deal and Climate Change

WHEN: JUNE 17-18-19, 2019

WHERE: PAVILLION CENTER - PRAIRIE KNIGHTS CASINO & LODGE FORT YATES, NORTH DAKOTA  
Room Block Available 701-854-7777

ALL  
AGES  
EVENT  
PUBLIC  
WELCOME  
EDUCATIONAL  
EVENT

Hosted by:  
**Standing Rock Sioux Tribe**



**For info contact:**  
Janet 701-301-0287

[jthomas@standingrock.org](mailto:jthomas@standingrock.org)  
PIC•COLLAGE

## Oceti Sakowin Oyate Strategic Planning

Facilitators: Patrick Kincaid and Phil Two Eagle  
Treaty Council's, Tribal Council's, THPO's, Directors, Tribal Employees, Tribal Colleges, Educators

January 30 & 31, 2020

Wakpa Sica Reconciliation Place  
Pierre, SD

### Tentative Agenda

- Mission, vision, and aspirations.
- Lakota values.
- Doctrine of Discovery
- Inherent Rights
- Traditional Lakota Government and Leadership
- Customary Laws and Traditional Protocols
- Territorial and Ancestral Boundaries
- Treaty Depredations and Litigation Plan
- Strengths, weaknesses, opportunities, and threats.
- Objectives, strategies, and operational tactics.
- Measurements and funding streams.
- Role of the Treaty Council's and Tribal Council's
- International, Federal, and Tribal Laws
- Unity with Partners and Allies
- The Role of Education and Tribal Colleges

For More Information: Contact Phil Two Eagle—Executive Director , Sicangu Lakota Treaty Council, PO Box 841, Rosebud, SD 57570. Email: [phil.twoeagle@rst-nsn.gov](mailto:phil.twoeagle@rst-nsn.gov). Phone (605) 747-2381 extension 390. Please let us know if you are coming so we can plan for logistics! No registration fee required to attend. A survey is being emailed in advance. Hotel reservations are on your own. No block of rooms reserved.

# NEDTalks



# NEDTalks



# NEDTalks





## HIGH-LEVEL POLITICAL FORUM ON SUSTAINABLE DEVELOPMENT

UN HLPF 2020 Side Event

### GEO INDIGENOUS ALLIANCE

#### VISION

Protect and sustain  
Indigenous Cultural Heritage  
utilizing and contributing to  
Global Earth Observation  
science, data and  
technology.

**James Rattling Leaf Sr.**

Founding Member of the GEO  
Indigenous Alliance



**Founding members, GEO Week Canberra Nov. 2019** (left to right) James Rattling Leaf Sr., Lawford Benning, Vonda Malone, Titus Letaapo, Mario Vargas.

July 9, 2020, UN-NY

# GEO INDIGENOUS HACK4COVID

*Join Indigenous communities in  
co-designing ICT tools to tackle COVID-19*  
[www.earthobservations.org](http://www.earthobservations.org)



**Ongoing!**





## INDIGENOUS LEADERS BIOS

**GEO COVID-19 HACKATHON 2020 JUNE 5-7**

CLAUDINETE COLE' DE SOUZA, QUILOMBOLA | BRAZIL

JAMES RATTLING LEAF SR., ROSEBUD SIOUX TRIBE | SOUTH DAKOTA, USA

LEO CERDA, KICHWA NATION | ECUADORIAN AMAZON

MARIO VARGAS SHAKAIM, SHUAR NATION | ECUADORIAN AMAZON

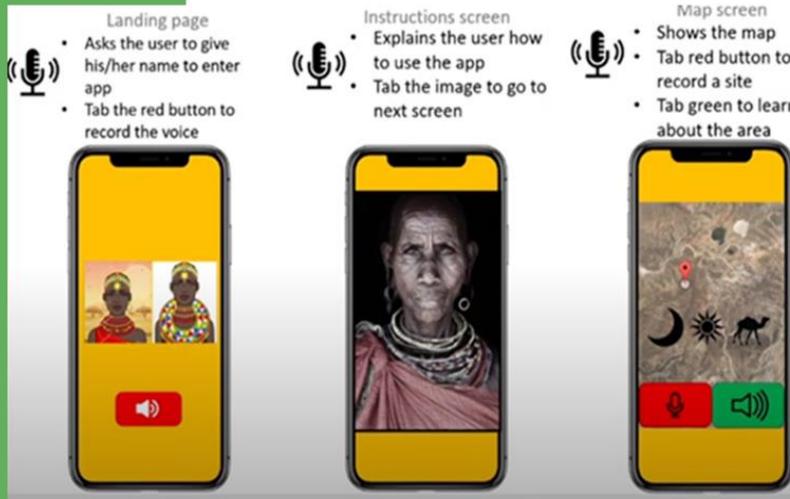
CHIEF ALMIR NARAYOMOGA SURUI | THE PATIER SURUI PEOPLE |

BRAZILIAN AMAZON

TITUS LETAAPO, SAMBURU TRIBE | KENYA







## Symbols Maps Team

Proposing a new way to map a land using local symbols instead of traditional geographic coordinates."

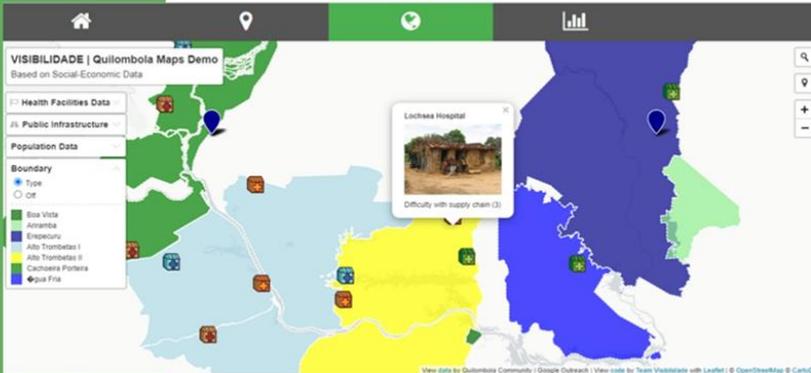
**Challenged submitted by: Titus Letaapo Samburu Tribe, Kenya**

Team members: Miroslawa A. Figueroa(Mexico/UK), Yoanna Dimitrova(Bulgaria/UK), Lucandrea Mancini(Italy), Nicolas M. Correa(Australia/Colombia)



## Visibilidade Team

"We are building a powerful tool that will help Indigenous communities to become more "visible" by making it super easy for them to share their story, data and maps."



**Challenge submitted by Claudinete De Souza, Brasil**

Team members: Miroslawa A. Figueroa(Mexico/UK), Yoanna Dimitrova(Bulgaria/UK), Lucandrea Mancini(Italy), Nicolas M. Correa(Colombia)



## Indigenous Alliance Symposium

### AUDIENCE PROFILE



GEO COMMUNITY



INDIGENOUS  
PEOPLES



YOUTH, EDUCATORS  
& ENTREPRENEURS

Covid 19

Women Empowerment

Youth/Education

Climate Adaptation

Agriculture

Disaster Risk Management

Indigenous Data Sovereignty

## Indigenous Data Sovereignty

- The right to Indigenous Peoples and Nations to govern the collection, ownership, and applications of their own data
  - Inherent right to govern their lands, resources and people
  - Community held information
  - Treaties, court cases, recognition and human rights framework
  - Knowledge belongs to the community

# NEDTalks

## Questions for Us...

- How can data facilitate nation building?
- How can tribes influence the better collection of data on their people and resources by third parties?
- What are the opportunities and challenges inherent in data building and data governance?
- Build a community of practice for Indigenous data sovereignty and Indigenous nations' governance of data?
- Share data initiatives in Indian Country and across international Indigenous communities?

## **NEDTalks**

**When Tribal nations collect data, we are telling our story in our own way.**

**As promoters of data, we are information gatherers and information keepers.**

**Just as our ancestors, we look at essential information to tell the stories.**

**These new stories are being told to sustain our people and forge our future.**

**NEDTalks**

# Windows of Opportunity

# NEDTalks



August 31 - September 3, 2020

## 2020 NATIONAL TRIBAL & INDIGENOUS CLIMATE CONFERENCE

*Tribal Resilience for Seven Generations*

The Institute for Tribal Environmental Professionals (ITEP) is honored to host the United States' First Biennial National Tribal and Indigenous Climate Conference (NTICC) along with support from the Bureau of Indian Affairs (BIA) Tribal Resilience Program. The NTICC is open to all US tribal nations and Indigenous Peoples from throughout the world, with an emphasis on including our Elders and Youth. The NTICC will convene experts on climate change and will include a balance of Traditional Indigenous Knowledges and Western Science.

We invite people to submit proposals discussing climate-related impacts, assessments, tools, adaptation planning, mitigation and actions in one or more of the below tracks.

Conference tracks include:

- Indigenous Knowledges
- Health & Well-Being
- Land
- Water
- Relocation
- Infrastructure
- Energy Systems
- Food Sovereignty
- Ecosystems and Biodiversity, and other tracks.

This conference will allow an opportunity to share information and support one another. *We welcome all to join us!*



Location: Minneapolis - St Paul, MN

Registration Opens mid-March

• Before August 1, 2020: \$200

• August 1, 2020 or later: \$250

Call for Proposals Now Open!

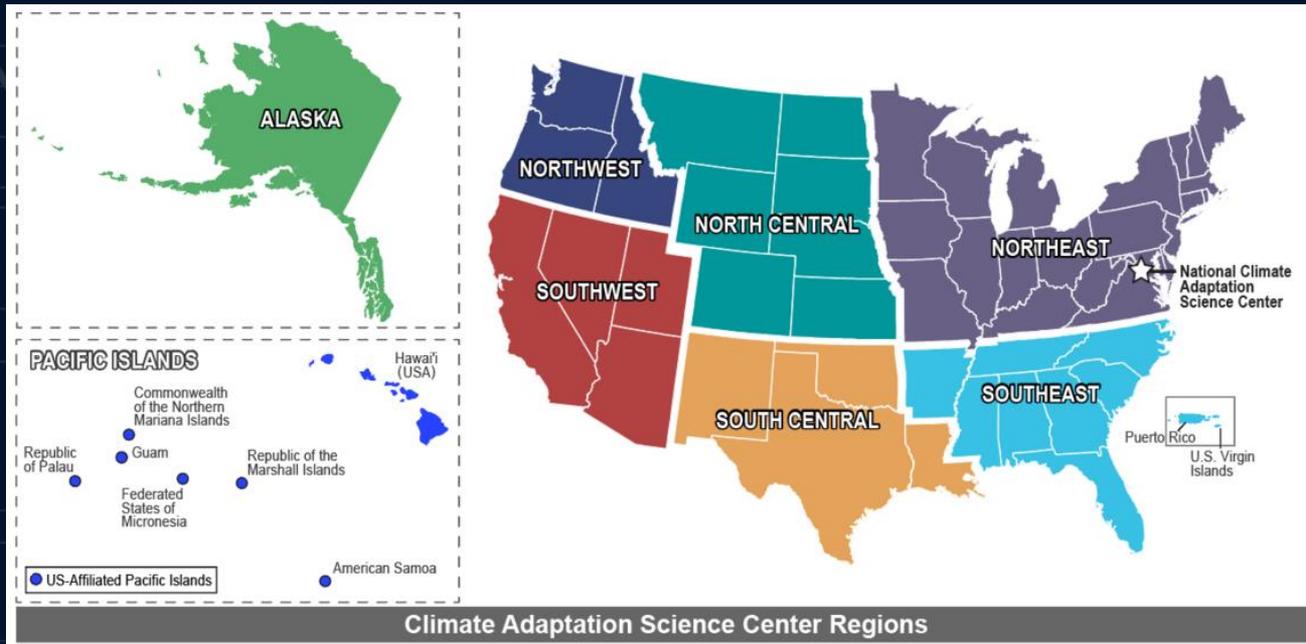
Keynote Speaker  
Winona LaDuke



# NEDTalks



# NEDTalks





## 2019 NATIONAL PLAN FOR CIVIL EARTH OBSERVATIONS

*A Report by the*  
U.S. Group on Earth Observations Subcommittee  
Committee on the Environment

*of the*  
NATIONAL SCIENCE & TECHNOLOGY COUNCIL

December 2019

# NEDTalks

# NIDIS



**NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM**

# NEDTalks



# NEDTalks

# AmeriGEO

## AmeriGEO Week 2019 Participation

 **1** Americas Caucus & AmeriGEO Coordination Working Group (CWG) Meeting

 **7** Training Sessions

 **7** Sessions

 **75** Total Institutions

 **105** People Trained



Remote Participants

### TOP OUTCOMES:

- A. Identified** future AmeriGEO Week venues for 2020 (Mexico) and 2021 (El Salvador / SICA)
- B. Selected** new leadership framework and representatives: US, Chile, and Peru serving on Executive Committee, Americas Caucus, AmeriGEO Coordination Working Group
- C. Reaffirmed** the four priority areas for AmeriGEO: Agriculture & Food Security, Biodiversity & Ecosystem Management, Disaster Risk Reduction, and Water Resource Management
- D. Identified** Health as a new area of strategic importance for AmeriGEO
- E. Established** a joint work plan with UNGGIM-Americas for activities related to SDGs and Disaster Risk Reduction, and to incorporate the work with the Caribbean countries, which includes collaboration with other regional organizations including IPGH, Esri, and others

# NEDTalks

## Rising Voices 3 Conference

### RISING VOICES 3 CONFERENCE

Bringing Together Science and Indigenous Ways of Knowing  
to Create Positive Solutions

National Center for Atmospheric Research (NCAR), Boulder, Colorado  
June 29-July 1, 2015

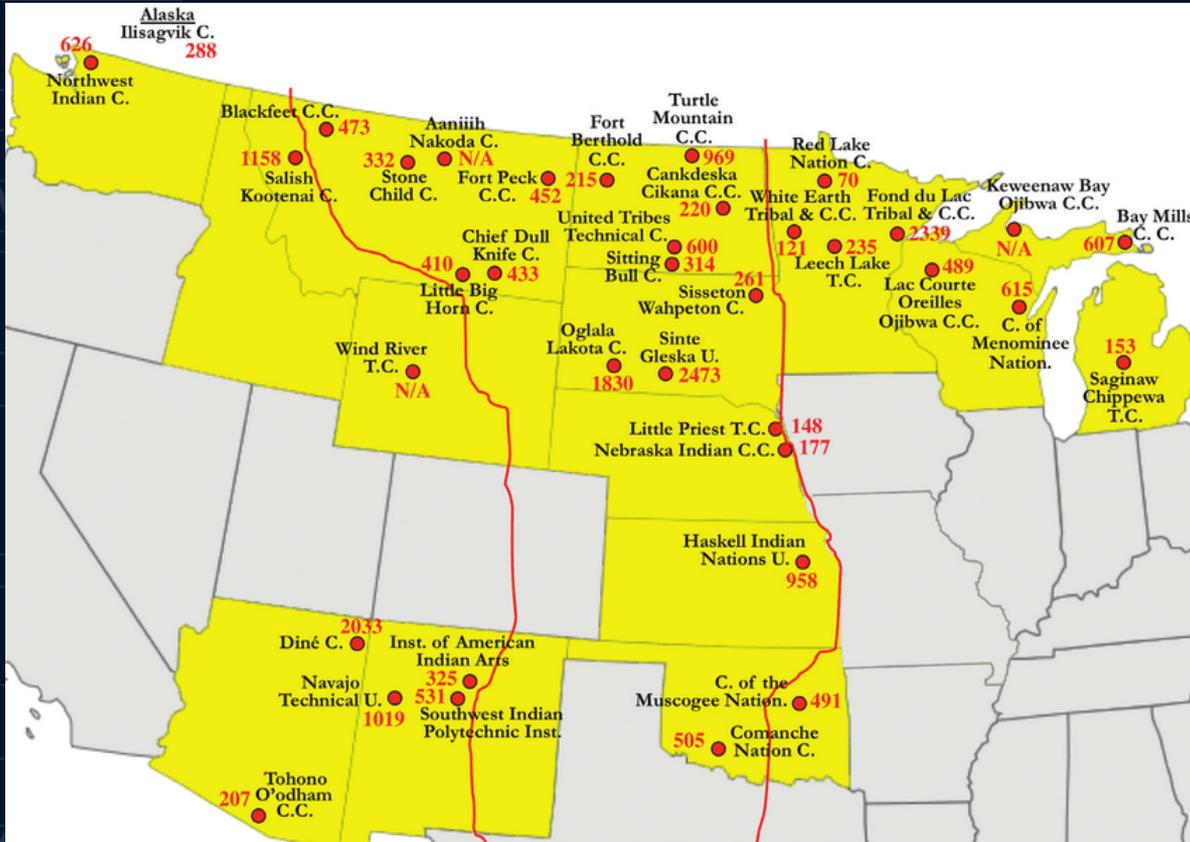
A Summary of Learning and Sharing  
by Cathy Techtmann-UW Extension Environment Outreach Specialist



Through the support of Epsilon Sigma Phi



# NEDTalks



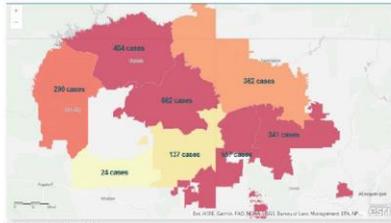
# NEDTalks

## DIKOS NTSAAÍGÍ (COVID-19) UPDATE Navajo Epidemiology Center

Helping with Making Data-driven Decisions for the COVID-19 response



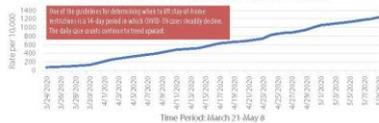
NEC Director Kenneth Kistner (left) meeting with IFD and CDC partners to conduct contact tracing using Genentech mobile application. NEC leads CDC (Dr. Ad) team to assist with COVID-19 surveillance and case history problem for better disease characterization.



Total cases as of May 8, 2020.

Figure 1: Navajo Nation\* COVID-19 Crude Incidence Rates

Source: Navajo Epidemiology Center and Navajo Area IHS Collaborative



\*Does not include data from border towns.

The Navajo Epidemiology Center (NEC) is playing a critical role in assisting with making data-driven decisions by collecting and analyzing data, and using them to develop appropriate strategies and activities for COVID-19 response on the Navajo Nation. NEC is working with partners (tribal programs, IHS, 638 tribal organizations, state health departments, academic institutions, non-profit programs, and CDC) to conduct COVID-19 disease surveillance, perform contact tracing, and manage the data to help with data visualization. NEC also shares its daily COVID-19 situational awareness reports with leaders, partners and general public to help with making informed decisions. Additional information can be found at: [www.ndoh.navajo-nsn.gov/COVID-19](http://www.ndoh.navajo-nsn.gov/COVID-19)

### What is epidemiology?

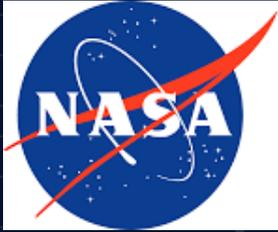
Epidemiology (*Dinilghí Naadikash*) is the study of disease in populations. It observes patterns by 'person, place and time', and attempts to answer the questions 'Who?', 'What?', 'Where?' and 'When?'. NEC collects information to learn who got sick, when they got sick, who might get sick, and where they reside on the Navajo Nation. This information helps protect the residents of Navajo Nation.

Contact us:  
Tel: 928-871-6539  
Website: [www.nec.navajo-nsn.gov](http://www.nec.navajo-nsn.gov)  
Email: [navajopei@navajo-nsn.gov](mailto:navajopei@navajo-nsn.gov)

## AZ ESF/RSF Operations Dashboard



# NEDTalks



**EARTH SCIENCE  
APPLIED SCIENCES**



**INDIGENOUS PEOPLES**



**SUSTAINABLE  
DEVELOPMENT**

**GOALS**

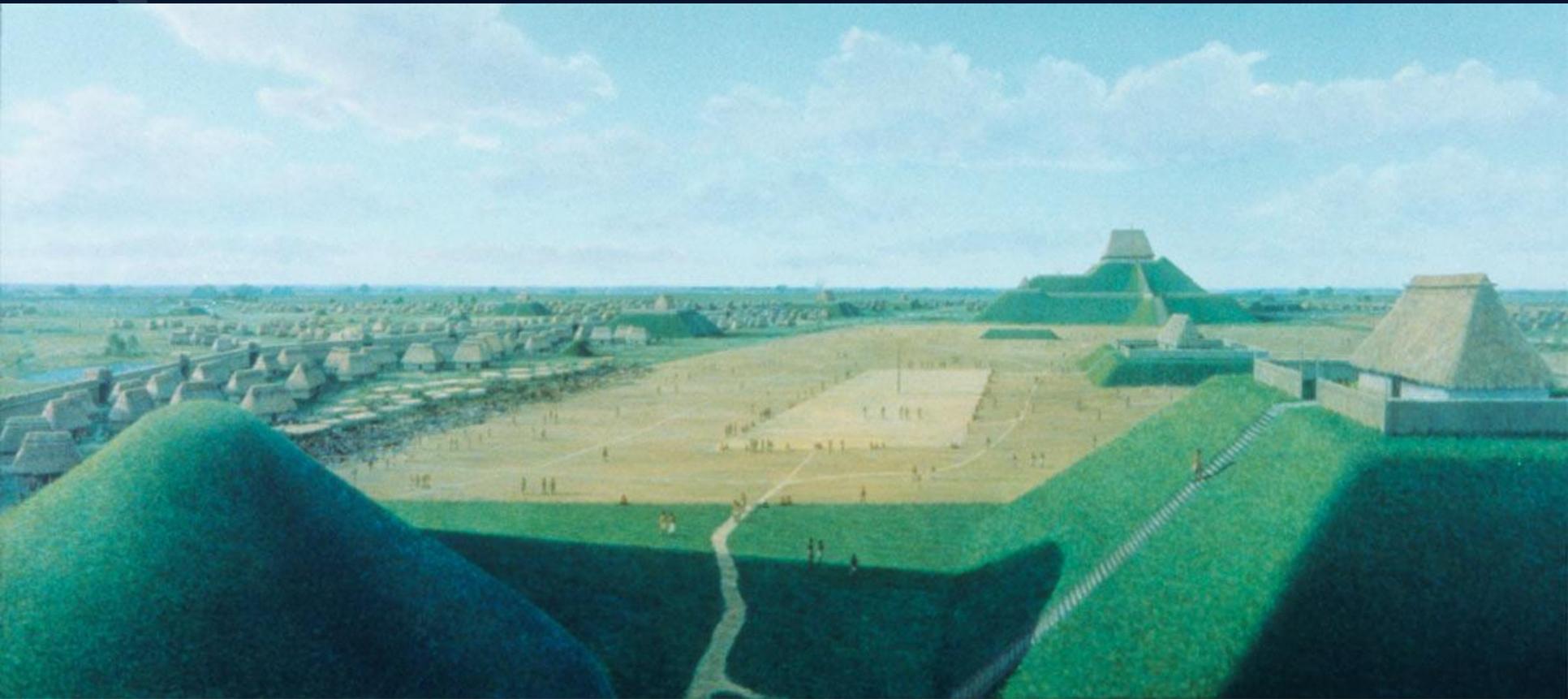
**2030 Agenda for  
Sustainable Development**

**Indigenous Peoples  
&  
the 2030 Agenda:**

# NEDTalks



# NEDTalks



## UNCI MAKHA TAWOUNSPE WAKITA

“Paying Attention to Grandmother Earth Teachings”

*Tribal Climate Leaders Program*



**James Rattling Leaf, Sr.**

*Vice-Chair, Rosebud Sioux Tribe Climate Crises Working Group*

*Co-PI, North Central Climate Adaptation Science Center*

*Research Associate, CIRES*

*Principal, Rattling Leaf Consulting LLC*



# Our Collective Situation

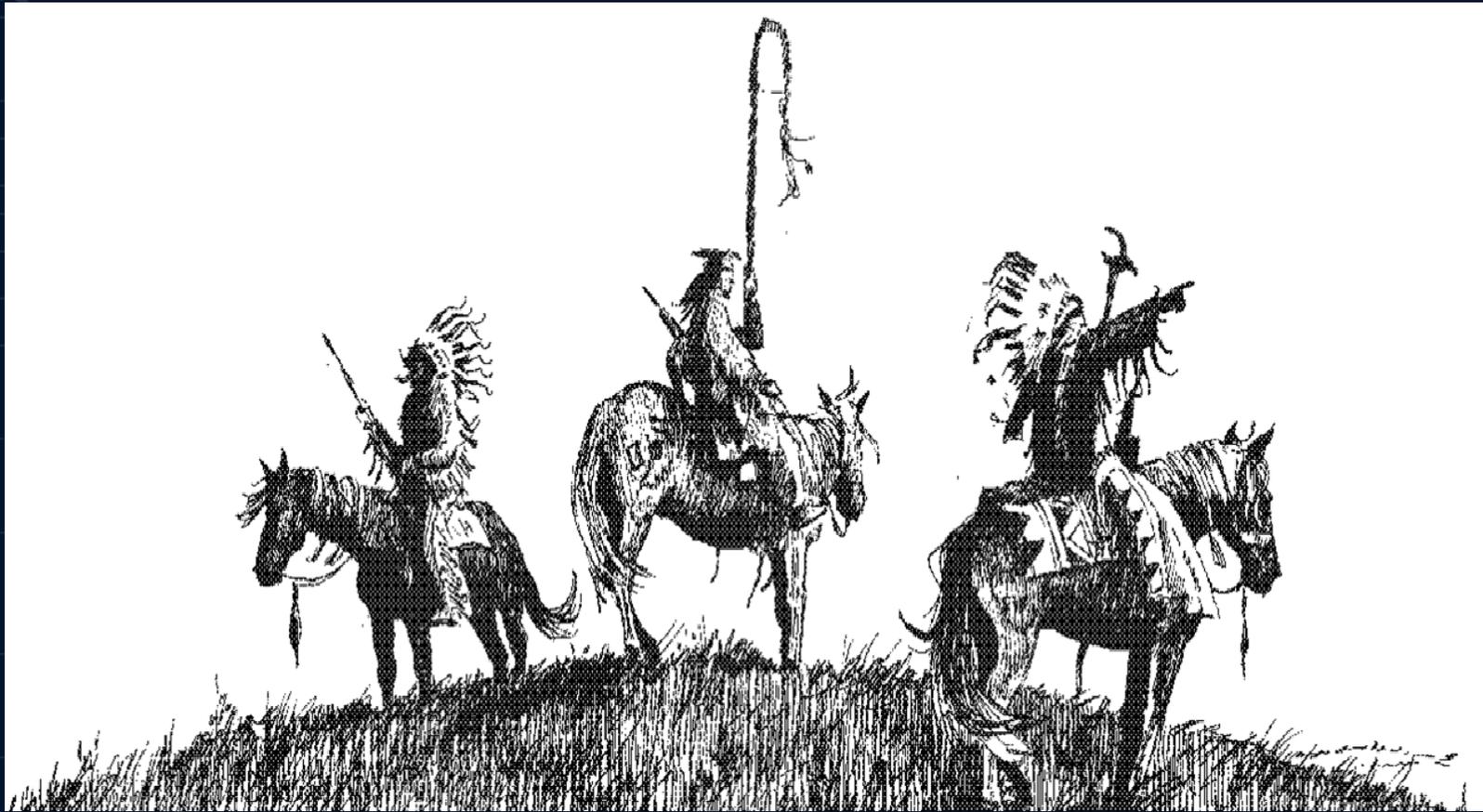
- The need to restore the balance of care and respect for people and the Earth
- Human problems and environmental problems have not improved in spite of new technologies and increasing wealth
- Need to raise the consciousness of people
- We need all ways of Knowing

# NEDTalks

## Continuing the Work

- Future research, education, and practice should be highly interwoven and requires emphasis on integrated and synthetic efforts
- Creative expertise from all relevant disciplines must be engaged to solve the common challenges facing research and education
- Advancement depends on extensive technology, observing systems, a trained workforce, and coordinated community participation
- Effective partnerships and communication among Tribes/Indigenous, academic, governmental, and private organizations are needed to address major challenges facing our world

# NEDTalks



**NEDTalks**

**Wopila Tanka Eciciyapelo**

Email: [james.rattingleaf@Colorado.edu](mailto:james.rattingleaf@Colorado.edu)