Oglala Lakota College

Preliminary Assessment
of
Natural Spring Potential
to
Enhance Drought Recovery
on the
Pine Ridge Reservation

E. Michael Collins
Marla Striped Face-Collins
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Research Team Members:

- Science and Math Dept.:– Mike Collins, Marla StripedFace-Collins
- Ag/Natural Resources Dept.: – Trudy Ecoffey, Leslie Henry
- TCUP Project Members: – Dieg Sandoval, Silvio Mannel
- Tribal Community Members: – Ed Iron Cloud, Marcelle Bull Bear

Purpose of Study

- Initial assessment of natural spring flow rates and water quality
- Support the Tatanka Waste project by providing a hydrologic component
- Aid in drought mitigation through identification and assessment of new water sources

Knife Chief Community Buffalo Herd – 40 head

Mitakuye Oyasin

- Translation – "All my relations"
- Paradigms – Western Science vs. Native Science
  - Western Science: Measurement is foundational, things proceed in linear fashion, objective and rational thinking; *purpose* - to dominate, control and exploit
  - Native Science: "Coming to know" ,\. Creation is dynamic and ongoing (in flux), all things are "alive", processes are cyclic, web of interrelationships is central; *purpose* - to understand our roles and responsibilities in relation to our surroundings

Western Science needs Native Science

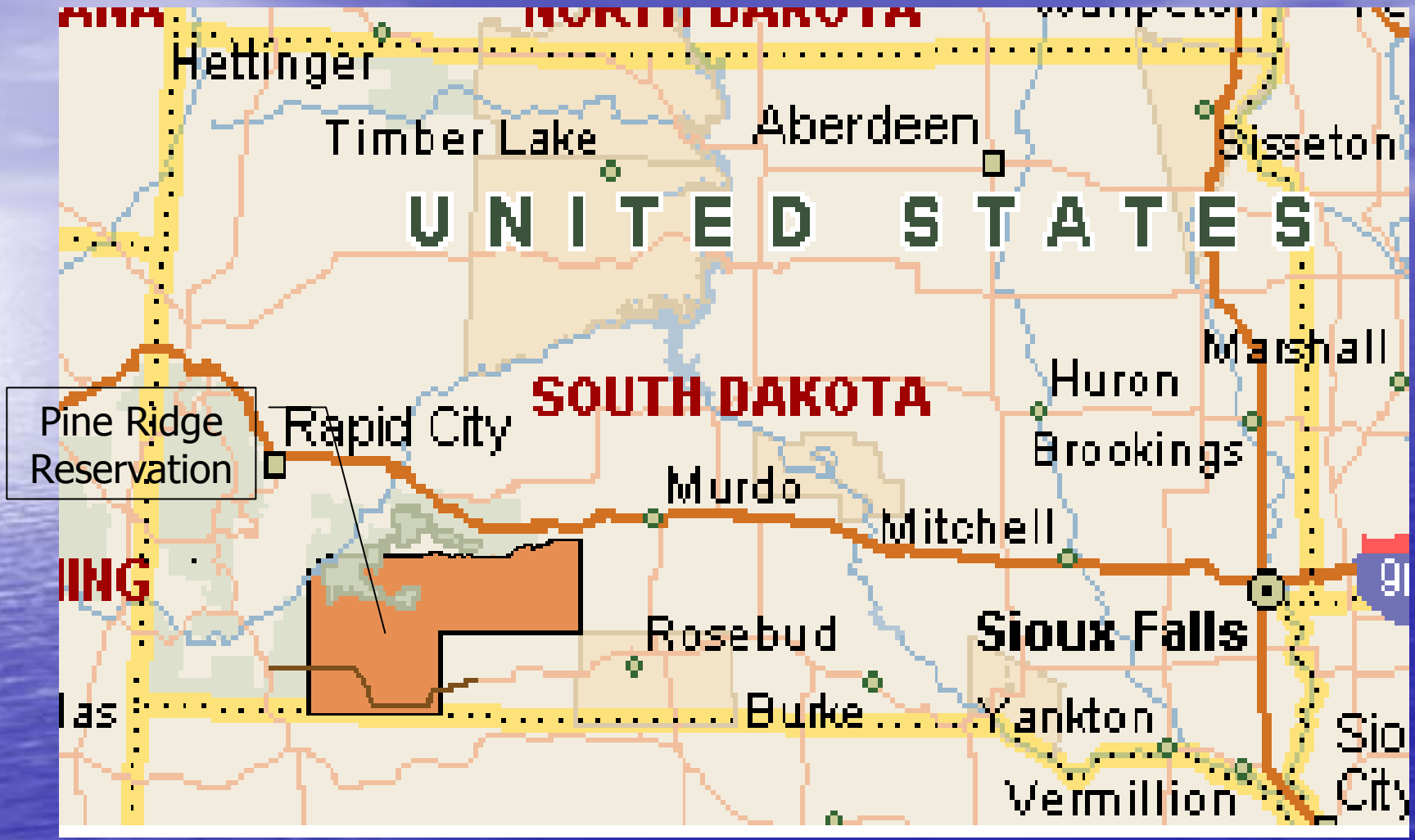
- Critically examine prevailing world view and cultural bias
- Reverse the process which tends to objectify and fragment all of human experience
- Assist in re-contextualizing data bits; that is, to recycle knowledge into a meaningful expression of wisdom

Project Steps

- Review previous work
- Survey natural springs
- Install weirs
- Set up and activate portable weather stations
- Assess weather influence on spring discharge rates, water quality, and GIS/RS interpretations
- Collect water quality samples
- Measure spring discharge rates
- Employ GPS/GIS/RS technology

Procedures

- Water discharge rate – weir
- Water quality sampling - using USGS Field Manual
- Water analysis - using spectrometer
- GPS - using Magellan GPS CX
- GIS – using ESRI ArcView 8.1
- RS – using high resolution aerial photos
- Weather data capture – using Rainwise portable instrument package and Weather View 32 software


Hettinger
Timber Lake
Aberdeen
Sisseton
UNITED STATES
SOUTH DAKOTA
Pine Ridge Reservation
Rapid City
Murdo
Huron
Marshall
Brookings
Mitchell
Rosebud
Sioux Falls
Burke
Yankton
Vermillion

Buffalo Exclosures - 3

Five Year Old White Buffalo

Install semi-permanent weirs at the two springs on the bison pastures

- Prepare site for customized installation
- Procure material
- Construct wier
- Measure discharge rate weekly
- Correlate to weather data
- Conduct on-site, detailed geologic/hydrologic interpretation

Survey known natural springs and review previous related work

- Use existing published maps and reports
- Interview area residents regarding spring locations and flow histories
- Integrate GIS,GPS, RS with "ground truth" and field measurements

Place portable weather stations

Collect water quality samples and measure spring discharge rates

Employ GPS/GIS technology

soil types map

Regional Geologic Map

Buffalo Pastures with Reservation outline with OLC location, Kyle, Porcupine

Buffalo Pasture close up with subunits, location of springs, and exclosures