Best Practices for Conducting Undergraduate Research at Tribal Colleges

Erin Riley, SIPI and Dr. Amy Ganguli, NMSU
What is the Best NFL Team in the United States?

A. Denver Broncos

B. New England Patriots

C. Dallas Cowboys

D. Arizona Cardinals
What is the Best NFL Team in the United States?

A. Denver Broncos
B. New England Patriots
C. Dallas Cowboys
D. Arizona Cardinals

B. New England Patriots
What is the population of American Indians and Alaska Natives?

A. 2.3 Million
B. 500,000
C. 5.2 Millions
D. 7 Billion
What is the population of American Indians and Alaska Natives?

A. 2.3 Million

B. 500,000

C. 5.2 Millions

D. 7 Billion
Which state has the highest proportion of AI or AN?

A. South Dakota
B. Oklahoma
C. New Mexico
D. Alaska
Which state has the highest proportion of AI or AN?

A. South Dakota (8.5%)
B. Oklahoma (7.5%)
C. New Mexico (9.1%)
D. Alaska (14.3%)
Number of federally recognized American Indian Reservations in 2010?

A. 324
B. 200
C. 724
D. 489
Number of federally recognized American Indian Reservations in 2010?

A. 324

B. 566

C. 724

D. 489
Number of federally recognized Indian tribes?

A. 566
B. 220
C. 324
D. 489
Number of federally recognized Indian tribes?

A. 566
B. 220
C. 324
D. 489
## Southwestern Indian Polytechnic Institute

### Number of Students Who Are

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<th>M</th>
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<tr>
<td>First Generation Students</td>
<td>85</td>
<td>115</td>
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<td>Not First Generation Students</td>
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<td>178</td>
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### Financial Background

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<tr>
<td>Avg Family income</td>
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<tr>
<td>Eligible for Financial Aid</td>
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<td>212</td>
</tr>
<tr>
<td>Not Eligible for Financial Aid</td>
<td>54</td>
<td>65</td>
</tr>
</tbody>
</table>

### Affiliated Tribes

- Navajo Nation
- Pueblo of Laguna
- Pueblo of Acoma
- Pueblo of Isleta
- Pueblo of San Felipe
- Pueblo of Santa Ana
- Jicarilla Apache Nation
- Zuni Tribe, New Mexico
- The Choctaw Nation of Oklahoma
- Pueblo of Jemez
- Kickapoo Tribe of Indians, Kansas
- Kiowa Indian Tribe of Oklahoma
- Turtle Mountain Band of Chippewa Indians of North Dakota
- Kewa Pueblo, New Mexico
- Cherokee Nation, Oklahoma
- Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin
- Te-Moak Tribes of Western Shoshone Indians of Nevada
- Cheyenne and Arapaho Tribes, Oklahoma
Advanced Technical Education Department

Program Areas:

- Computer Aided Drafting and Design
- Culinary Arts
- Geospatial Information Technology
- Natural Resources Management
- Network Management
- Pre-Engineering
- Vision Care Technology
The Natural Resources Management Program will prepare students to enter the natural resources field at the technical level with the knowledge and skills required to meet current employment standards.

GOALS

• Students will be able to work as technicians in the field of Natural Resources
• Students will be able to serve as leaders in the field of Natural Resources

SIPI Natural Resource Management students, Dustin Toledo, learn wildlife management practices at Valles Caldera National Preserve

Students from NATR 221 collecting plants for the herbarium
Discussion Question 1

How is research at Tribal Colleges different from research at 1862’s?
1994 Land Grant Research Leadership Development Initiative Partners

1. New Mexico State University
2. United State Forest Service
3. Agriculture Research Service
4. First Americans Land-Grant Consortium (FALCON)
1994 Land Grant Research Leadership Development Initiative

Goals

1. Increase the 1994’s Land Grant Institutional Research Capabilities

2. Collaborate with mentors to assist in publishing in peer reviewed journals

3. Build a culturally appropriate herbarium

Inside SIPI’s greenhouse

SIPI’s Hogan
Discussion Question 2

What types of research are you doing at your college?
1. Increase the 1994’s Land-Grant Institutional Research Capacity

- **Short Term Research Capabilities**
  - 3 Day Workshop in Las Cruces, NM
  - Webinars

- **Long-Term Research Capabilities**
  - Long Term Plots on SIPI & Isleta Pueblo
  - Storage of Data and Metadata
Long-Term Research Workshop

Describe how your institution is building its research capabilities:

• Identify culturally accepted research in tribal communities

• MOU’s and programs with FS, and Land Grant institutions

• Establishing consistent funding

• Having a long term mission

What methods will you incorporate into your program?

• Hands on lab work

• Culturally relevant curriculum

• Small scale long-term research

• Smartphone apps
Discussion Question 3

What is Research Capacity?
Webinar
Dr. Jeremy Pinto (USFS)
“Using Traditional Ecological Knowledge to define target native plants for restoration”

Survey Responses:
• How many tribes are involved with this program
• Target Plant Concept explanation and information
• It was all excellent
• The strong nursery industry in Indian Country
• Hearing about the tribal nurseries
What do you see as the biggest benefit of conducting research at 1994’s?

A. Institutional Credibility

B. Intellectual Sovereignty

C. Hands on experience

D. Student Faculty Relationship building
Long-Term Monitoring Plots on the SIPI campus
Kyle Adson and Shannon Wasuli
Pottery Mound Site, Isleta Pueblo
Long-term Monitoring Plots
Pottery Mound Site, Isleta Pueblo
Long-term Monitoring Plots
Riparian Erosion

Gully Erosion Control Structures
Erosion Control Structures

Small Dams (N=7)  Large Dams (N=3)
Pottery Mound Site, Isleta Pueblo
Long-term Monitoring Plots

Isleta Transect Basal Gaps for July, 2015

Source: USGS, National Geographic (NAD83 UTM Zone 13N)
Pottery Mound Site, Isleta Pueblo
Long-term Monitoring Plots
Kenneth Epaloose and Nathan Apache
What is the biggest barrier to doing research at tribal colleges?

A. Lack of research models
B. Conflict between faculty research interest and needs of the tribal college mission
C. Faculty lack of time and resources
D. Lack of administrative support
2. Collaborate to publish in peer-reviewed journals

Peer-reviewed publication and platform development for continued research and scholarly activity

Navajo Names for Plants. [September, others from the animals which they seem to attract or furnish food for, others from fancied resemblances. The following list of some of the more important plants will show their different modes of devising names:

Order Ranunculaceae.

Delphinium scaposum Greene, tha'-di-the-de-til?, “blue sacred powder.” The powdered petals are used by the Shamans as a sacrifice to the gods of the south. Blue is the color sacred to the south in Navajo rites.

Order Berberidaceae.


Berberis repens Lindley, kin-li-tso’-ee, “yellow twigs.” The wood is yellow.

Order Cruciferae.

Draec montana Watson, a-di-be-i-tso. The name refers to its supposed diuretic properties.

Arabis holbiilii Hornemann, a-say-la-di-tay-hay, “scattered,” or “lone medicine.” The plants grow singly and at a distance from one another, not in beds or clusters.

Thesium wrightii Gray, nav-chalt’a-say’, “medicine for swellings.”

Stanleya pinnatifida Nuttall, teh-chash-a-say, “medicine for the rock-worm,” i.e., a glandular swelling.

Physaria newberryi Gray, chash-a-say, “sneeze medicine.” Used as a snuff in catarrh.

The American Naturalist, Vol. 20, No. 9 (Sept., 1886), pp 767-777
3. Build a culturally appropriate herbarium

Zéé’ilwo’ii
*Hordeum jubatum*
Foxtail barley

*Muhlenbergia arenicola*
Sand muhly

Ts’ah
*Artemesia tridentata*
Big Sagebrush

Navajo
3. Build a culturally appropriate herbarium

Fremont Cottonwood
*Populus fremontii*

Annual Sunflower
*Helianthus annuus*

Narrowleaf Yucca
*Yucca angustissima*

Santa Domingo
• **Culturally Appropriate Curriculum**
Cultural standpoints of tribal sensitivity regarding significant plants

MICHAEL MEYERS, NEW MEXICO STATE UNIVERSITY
DR. AMY GANGULI, NEW MEXICO STATE UNIVERSITY
ERIN T. RILEY, MS, SOUTHWESTERN INDIAN POLYTECHNIC INSTITUTE
Respect toward tribal communities

• People historically interested in traditional uses of significant plants.
• Sometimes information misused when obtained.
• The purpose of this presentation is to:
  ◦ Illustrate views of tribes,
  ◦ what tribes are willing to share,
  ◦ framework to respecting tribal communities.
Background Information

• Significant plants of tribal communities.
Background Information

- Issues associated with significant plants.
Background Information

- Preservation of knowledge in southwestern tribes.
Objectives

• Characterize views of southwestern tribes on sensitive plants to identify what knowledge tribes are willing to share.

• Create an understanding of tribal views to provide a framework to educate the public.
View of sensitive plants

- Understanding the different perspectives, “Tribal societies culture and environments are diverse, addressed independently” (Phillips, 2003).
What Knowledge is being shared

• General use of plants, no specific detail of traditional use.

• Common significant plants used by multiple tribes.

• Use of common significant plants.
Creating a trust

• Understanding the religion
• Community engagement
• Acting on tribal concerns
• Disclosed information
• Misunderstanding tribal regulations
Creating a trust

• “Looking at the past can determine the future” (Lomawaima, 2000).
Facing new opportunity and challenges

• Tribes creating guideline/protocols to researchers.

• Research proposals, being approved through tribal council and community.

• Following guideline of tribal education system, what knowledge is known by the teachers.
Summary of Findings

• Tribes willing to Share information about significant plants in the community.

• Creating a framework of how the information should and will be used.
Which is most important when building a research institution?

A. Forming healthy partnerships with other land grants and TCU’s

B. Convincing administration of the value of research and education

C. Communicating why research is beneficial

D. Build resources to track, manage and understand research
# TCU Research Workshop (Falcon 2014)

## HOW TO BUILD RESEARCH AT 1994 LAND-GRANTS

### Capacity Building
- Determine what college is capable of doing and building on strengths-- start small and practical
- Access to libraries of information and data
  - Forming healthy partnerships with other Land Grants and TCUs
- Forum for sharing research among the TCUs
- Have instructional/research plan
- Hire people that can do research (ability)/IR office with qualified staff other PD and support staff
- Dollars to purchase equipment, labs infrastructure
- Building support within TCU—explain why research is being done
- Publish and share findings
- Build resources to track, manage and understand research
- Develop competent IRB
- Finding the time and money to go to conferences (scholarships)
  - Convincing administration of value of research for education

### Faculty Support
- Add faculty or provide existing faculty release time
- Aligning the research agenda with the instructor’s interest and expertise
- Offer Faculty incentives—sabbaticals, release time, bonuses, policy adaptation, summer funding
- Provide training

### Student Support
- Growing your own scientific expertise with you students
- Develop students / internship

### Community Engagement
- Connecting with the community elders and government -- getting their input
- Resolve priorities: grant funding vs community links to research areas
- Faculty must return to tribal college research, impacts, data
  - Communicate why research is a benefit
- Review evaluation of the pipeline programs. Are they leading to research?
- Address fears associated with research (mistrust)

*Special Thanks to Jill Lee for compiling this data*
## BARRIERS TO CONDUCTING RESEARCH

### Institutional Capacity
- Lack resources
- IRB—not used and not staffed
- No tracking system for past research
- Limited number of students
- No IR office or staff (Institutional research?)
- Lack of faculty
- Lack of student interest
- Lack of research models
- Schools struggle to define what makes a good research environment for their institution

### Community Awareness and Support
- Communication with college administration—lack of administrative support
- Student engagement and retention—Students don’t see value in research
- Students stressed with other priorities
- Cultural events/commitments interfere
- Conflict between faculty research interests and needs of the tribe or college mission
- Researcher not being an enrolled member creates tension
- Need for research to be culturally relevant and owned by tribal community

### Faculty Support
- Faculty lack time and resources—have a primary priority of teaching
- Lack of time to do research
- High Turnover
- Retiring faculty—don’t want to put effort into research at career close
- Faculty stretched with too many responsibilities—teaching load

*Special Thanks to Jill Lee for compiling this data*
| Institutional Benefits | • Intellectual control to further student knowledge  
|                        | • Maintain program and curriculum rigor  
|                        | • Achieve independence from the 1862s and other four-year universities  
|                        | • Institutional credibility  
|                        | • Benefits of IRB requirement at the TCU  
|                        | • No research, no advancements  
|                        | • Creates other pathways for funding  
|                        | • Resources, gardens facilities  
|                        | • Reflects values of institution  
|                        | • Indirect cost dollars  
|                        | • Faculty retention  
|                        | • Student retention  
|                        | • Grant dollars  
|                        | • Research publications  
|                        | • Create jobs, partnerships and networks  
|                        | • Empowerment through ownership of resources  
|                        | • Helps the community understand the benefit of having a tribal college  
| Community Benefits     | • Intellectual sovereignty  
|                        | • Evidence for legal or political initiatives  
|                        | • Historical preservation  
|                        | • Address community needs  
|                        | • Enhance local awareness/responsibility  
|                        | • Local research is better—more trust from community  
|                        | • Research can change Tribal policy  
|                        | • Building community ownership and empowerment  
|                        | • Reclaiming knowledge from previous research  
| Student Benefits       | • Hands-on experience—meaningful for students—STEAM  
|                        | • A confidence builder  
|                        | • Connects students with environment  
|                        | • Transitions to next steps in learning  
|                        | • Opportunity for long range research through generations of students—empowers students who in turn each their own children  
| Faculty Benefits       | • A confidence builder  
|                        | • Opportunity to partner and mentor with others  
|                        | • Student/faculty relationship building and retention  

*Special Thanks to Jill Lee for compiling this data*
Accomplishments

• Collaborative relationships built with the USDA ARS & Forest Service, NMSU, and other institutions

• NMSU Grad Student of Dr. Lois Stanford doing research at SIPI

• Tribal College Focus on research

• Long term monitoring plots on SIPI’s campus and Isleta Pueblo

• Indigenous curriculum and pedagogy

• Retention of students
Accomplishments

• Relationships with entities and partners

• TCU infrastructure and administrative capabilities

• Sub-award limitations
Things to Work On

• Relationships with entities and partners

• TCU infrastructure and administrative capabilities

• Grants.gov vs. Fastlane
What is the Future of Doing Research at Tribal Colleges?
Exciting Things to Come

• Two webinars that will be disseminated towards all TCU’s (Dr. Jeremy Pinto and Dr. CeCe Cometsevah)

• Publication from the experience

• More Research Grants
Questions?

Acknowledgements: This work would not be possible without the generous funding provided by USDA-NIFA with additional support provided by SIPI and NMSU.
Pottery Mound Site, Isleta Pueblo
Long-term Monitoring Plots
SIPI Archive
Supporting Research at Tribal Colleges

Building infrastructure
Increasing capacity
Which state has the highest proportion of AI or AN?

A. South Dakota
B. Oklahoma
C. New Mexico
D. Alaska
1994 Land Grant Research Leadership Development Initiative

1. What we did

2. Why are we doing this

3. Future Implications
• 86% of TCU students complete their chosen program of study

• Less than 10% of AI/AN students who go from reservation high schools to Western colleges finish their bachelor’s degree.
Workshop Participants Survey Responses

• Describe how your institution is building its research capabilities:
  - Identify culturally accepted research in tribal communities
  - MOU’s and programs with FS, and Land Grant institutions
  - Establishing consistent funding
  - Having a long-term mission
Workshop Participants Survey Responses

• What methods will you incorporate into your program?
  - Hands on lab work
  - Culturally relevant curriculum
  - Small scale long-term research
  - Smartphone apps
What was the most interesting part of this webinar to you?

Survey Responses:

• How many tribes are involved with this program
• Target Plant Concept explanation and information
• It was all excellent
• The strong nursery industry in Indian Country
• Hearing about the tribal nurseries
Why are we doing it?
Webinar
Dr. Cecelia Cometsevah (SIPI)
Acknowledgements

United States Department of Agriculture
National Institute of Food and Agriculture
NSF
Questions?