Integrating Education, Research and Development in Geospatial Information Technology at Southwestern Indian Polytechnic Institute

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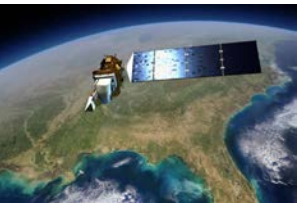
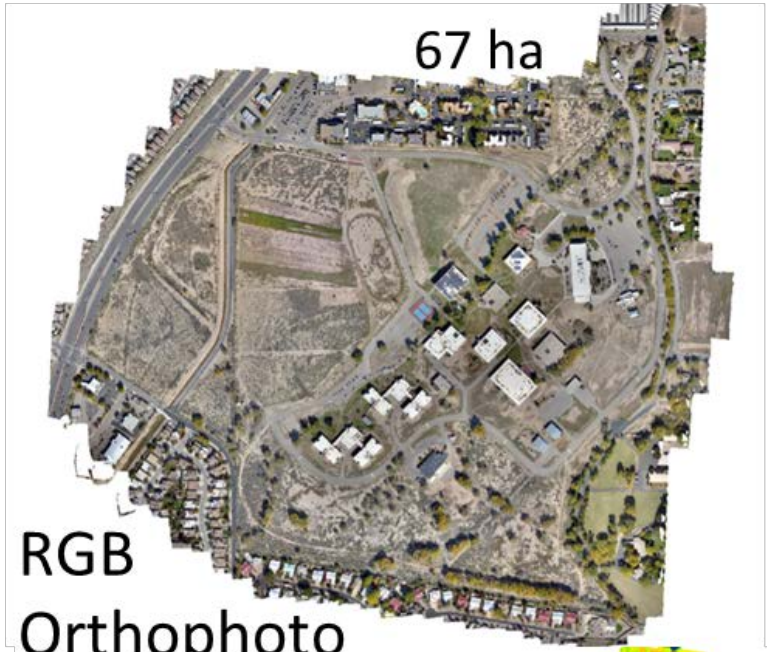
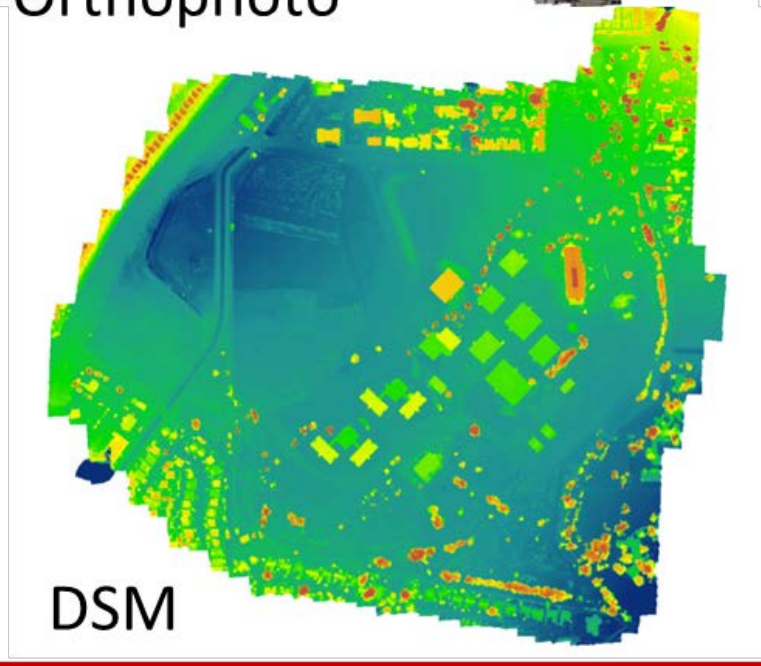
What is Geospatial Information Technology?



- ***The Science of "Where"***
- **Acquiring Spatial Data**
  - Global Positioning Systems (GPS)
  - Remote Sensing
- **Analyzing Spatial Data**
  - Image Processing
  - Geographic Information Systems (GIS)
- **Communicating Spatial Information**
  - Digital Mapping





SIPI

SIPI Geospatial Information Technology (GIT) Program

AAS Degree ▪ Certificate

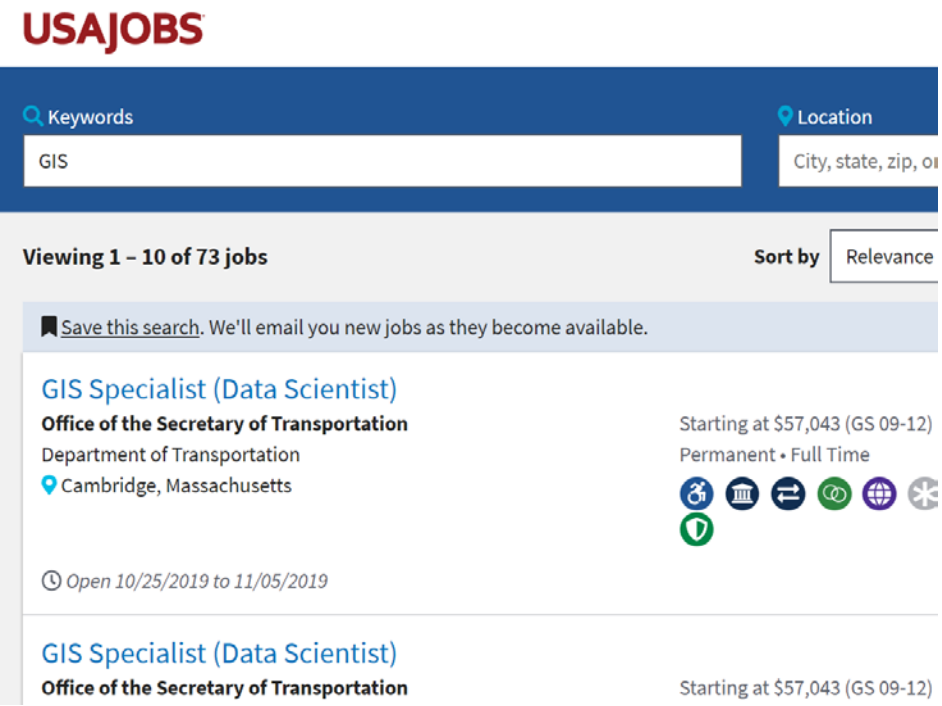
GIS Job Listings on Oct. 26, 2019

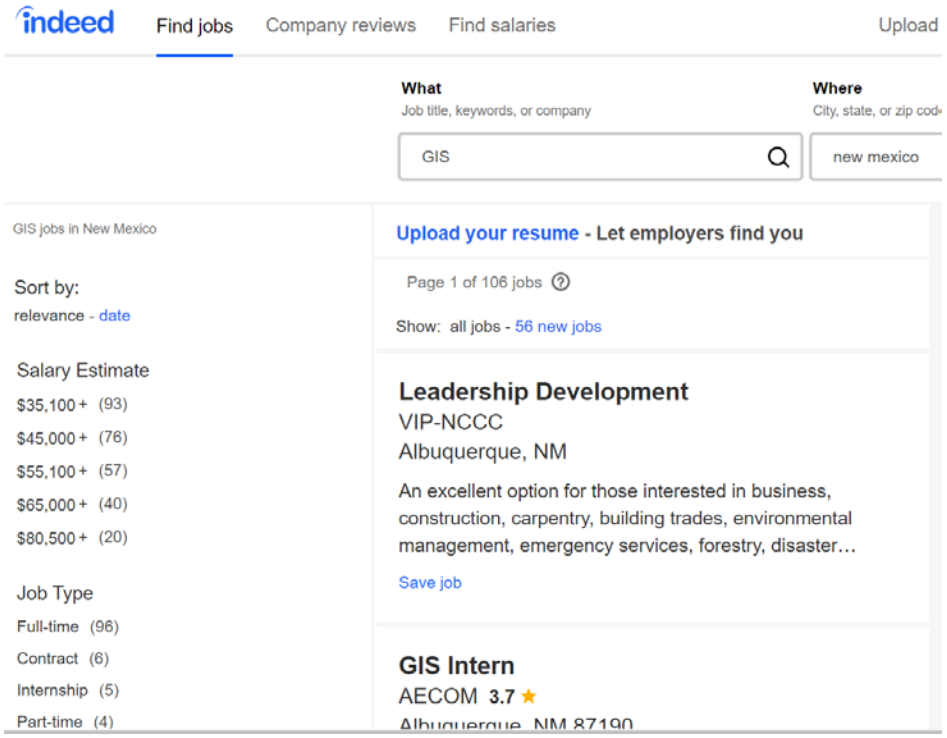
USAjobs.gov

All states: 73

Indeed.com

AZ:	182	NM:	106
ND:	40	SD:	27
MT:	61	OK:	79





Summer GIT Courses
Open to Tribal Employees & Tribal Members

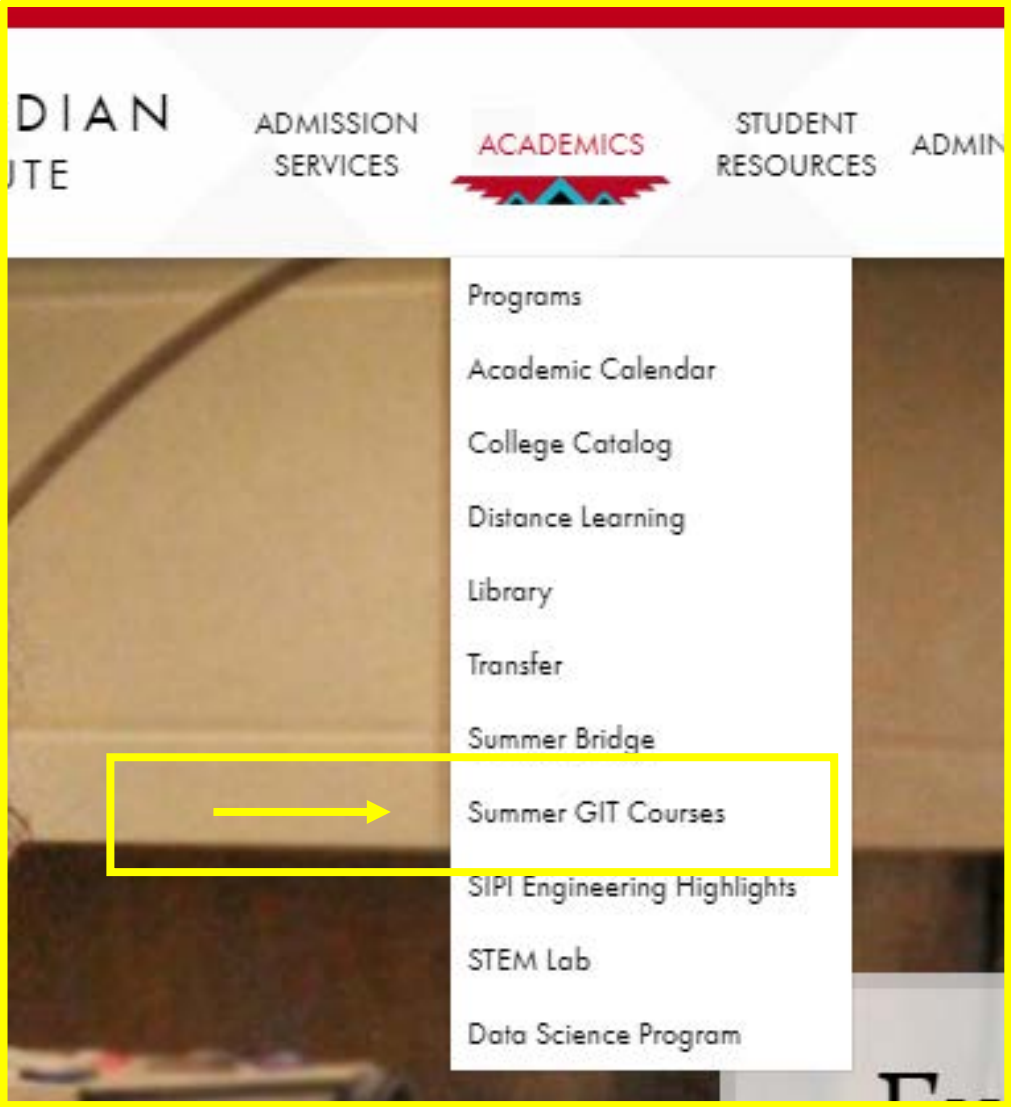
Dates	Course Number	Course Name
May 13-17	GIT 101	Digital Cartography
May 20-24	GIT 111	Intro to GIS and GPS
June 3-7	GIT 121	Advanced GIS and GPS
June 10-14	GIT 202	Photogrammetry
June 24-28	GIT 203	Remote Sensing
July 15-19	GIT 201	GIS and GPS Applications
July 29-Aug 2	**GIT 290**	**Special Topics: Intro to Mapping with Small Unmanned Aircraft Systems (sUAS)**

SIPI

Summer GIT Courses
Open to Tribal Employees & Tribal Members

- 2020 Summer registration opens mid-March
- Info on SIPI website

https://www.sipi.edu/



SIPI Advanced Technical Education (ATE) Dept.

- Geospatial Information Technology (GIT)
- Natural Resources Management
- Environmental Science
- Pre-Engineering & CADD

Geospatial Information Technology

Natural Resources Management

Environmental Science

Pre-Engineering & CADD

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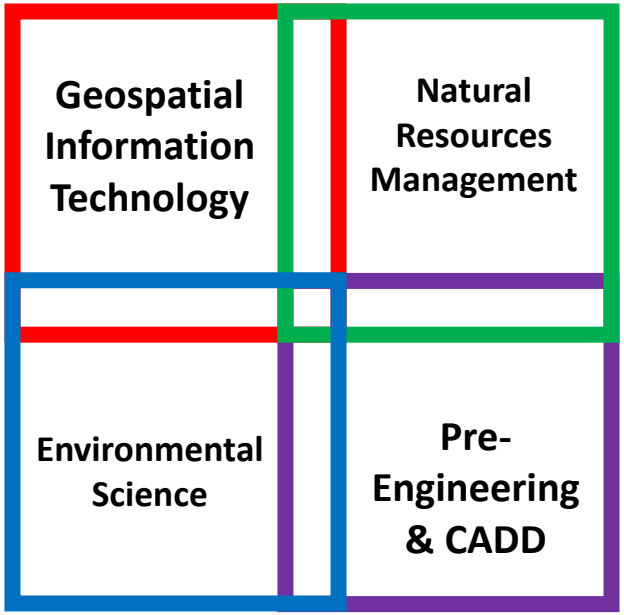


Research Project #1

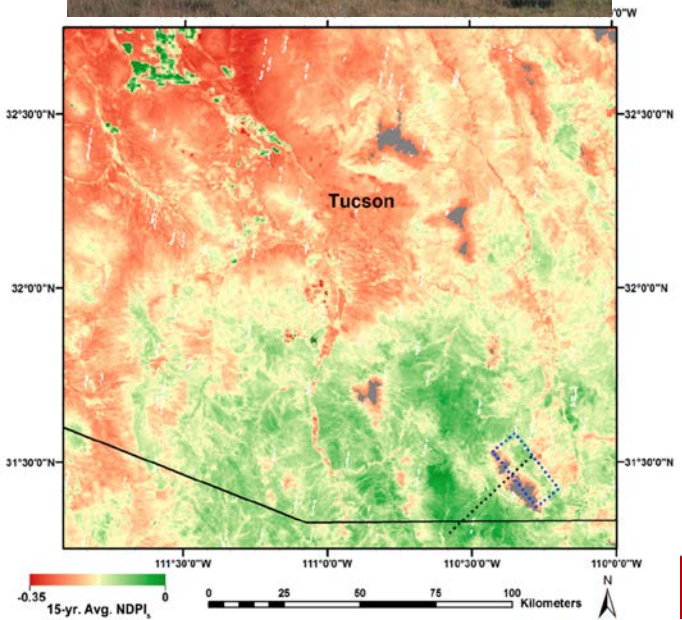
Enhancing Native American Education and Land Management through Research, Collaboration and Training on Remote Sensing of Southwest Rangelands

Collaborators: SIPI (lead), NMSU, Pueblo of Isleta, UNM, USDA-ARS Jornada

Funding: USDA-NIFA Tribal College Research Area of Expertise (TCRAE)

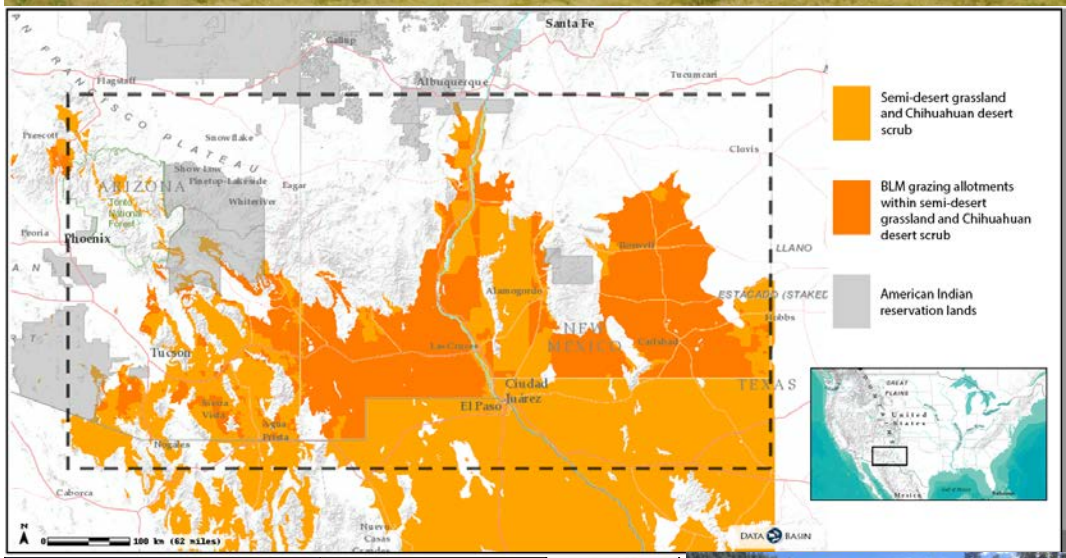
Period: 2 yrs, 2019-2021

- Science
  - Satellite monitoring of grass forage conditions in Southwest rangelands
  - Data and information system for rangeland management
- Education
  - Engage students in research experiences
  - All majors are eligible
- Extension
  - Input from Tribes and other stakeholders on information needs
  - Share knowledge, methods and products



Rangeland Project Activities

- **Field Research**
  - Vegetation phenology
  - Handheld spectroradiometer
  - Portable multispectral imaging systems
  - UAV-based imaging
- **Lab Research**
  - Satellite image processing
  - Data analysis
  - GIS mapping
- **Training & Outreach**
  - SIPI students
    - summer course in desert ecology
    - mentoring by NMSU researchers
  - Tribes & other stakeholders
    - Consultation meetings
    - Workshops

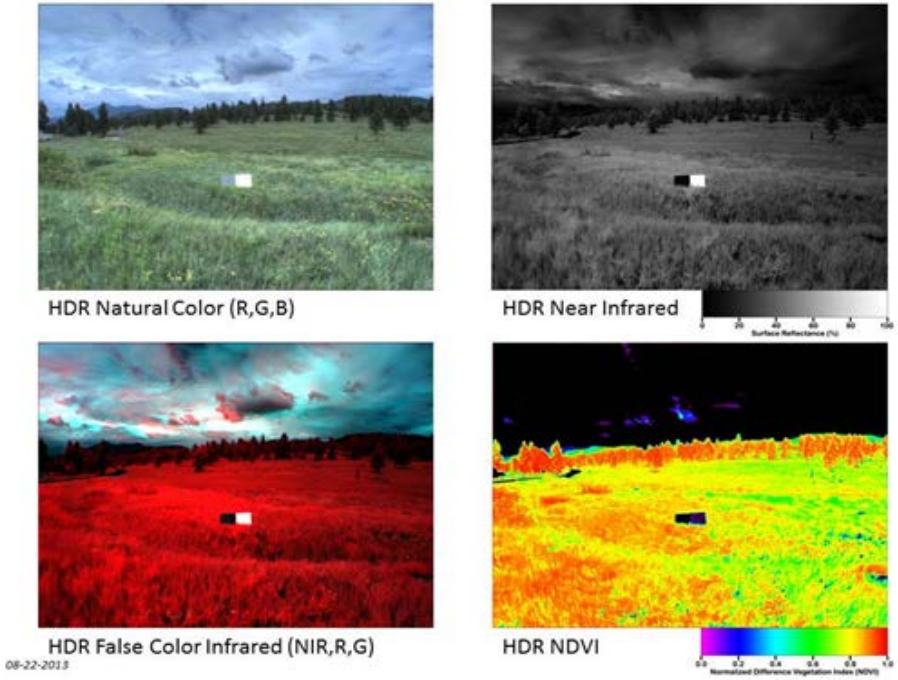


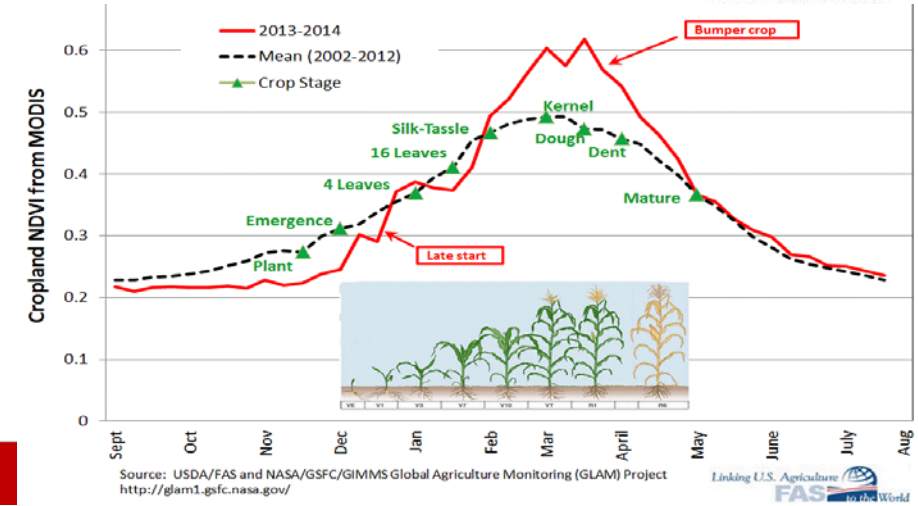
Research Project #2

Developing a Multispectral Imaging System for Landscape Analysis and Monitoring

Funding: NSF Tribal College and University Program (TCUP)

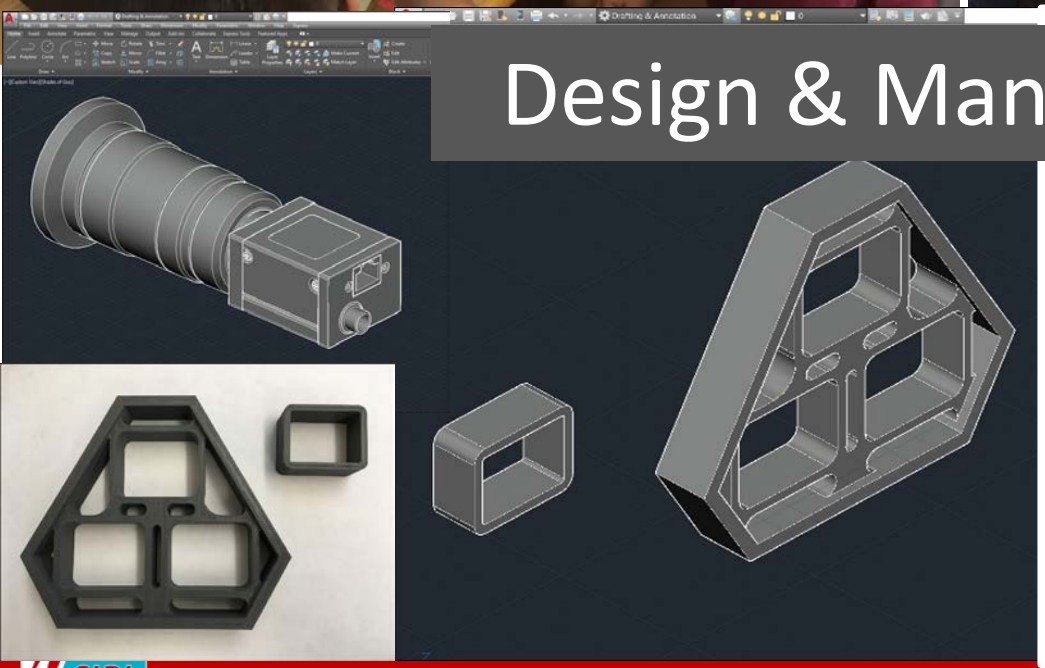
- Advanced Technology
  - Scientific quality
  - Natural color, red, NIR, NDVI
  - Portable or fixed (phenocam)
- Interdisciplinary Collaboration
  - *Hardware/Software:* Engineering/CADD students
  - *Applications:* GIT, Nat. Res. Mgt, Env. Sci. students
- Extension
  - Share knowledge and tools
    - Tribes
    - Other TCUs

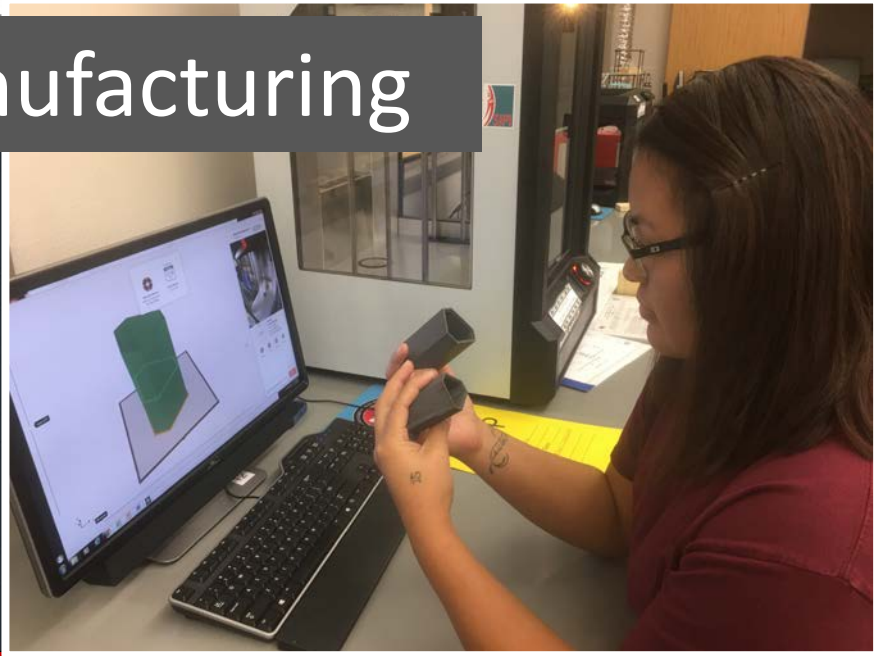




Software Development

Design & Manufacturing





SIPI

Conclusions

- **Research …**
  - Enhances students' educational experience
  - Promotes inter-program collaborations
  - Strengthens foundation for Extension
- **Future Directions …**
  - Build on successes
  - Emphasis on precision agriculture and environmental monitoring
  - New training opportunities for Tribal communities

TribalGIS.COM - N.T.G.I.S.C. - 201

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Albuquerque, NM

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Thank You

Geospatial Information Technology (GIT)