



CENTER FOR ADVANCEMENT
OF SPATIAL INFORMATICS
RESEARCH & EDUCATION

Host Welcome & Introduction

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ASSISTANT PROFESSOR, DEPT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES

Welcome to UNM!

Mission: The University of New Mexico serves as the state's premier institution of higher learning and provider of health care by promoting discovery, generating intellectual and cultural contributions, honoring academic values, and serving our community by building an educated, healthy, and economically vigorous New Mexico.

- R1 University
- Hispanic Serving Institution
- Minority Serving Institution
- Flagship University of NM

UNM Values

- **EXCELLENCE:** We value excellence in all of our work, and we strive to perform and achieve at the highest levels.
- **INCLUSION:** We respect and celebrate the differences of all persons and value working in a collaborative environment where diversity is cherished and there is a shared sense of belonging.
- **ENVIRONMENT:** We are dedicated to the protection of our planet to ensure the health, well-being, and success of future generations.
- **INTEGRITY:** We value fairness, honesty, and transparency. We are good stewards of the resources that have been given to us.
- **PLACE:** We are dedicated to the peoples and places of New Mexico even as we reach for global impact for the benefit of all humanity.



\$389M

EXPENDITURES IN FY24

2,500+

PUBLICATIONS IN 2024

MEASURES OF RESEARCH EXCELLENCE

1,900+

AWARDS RECEIVED
IN FY24

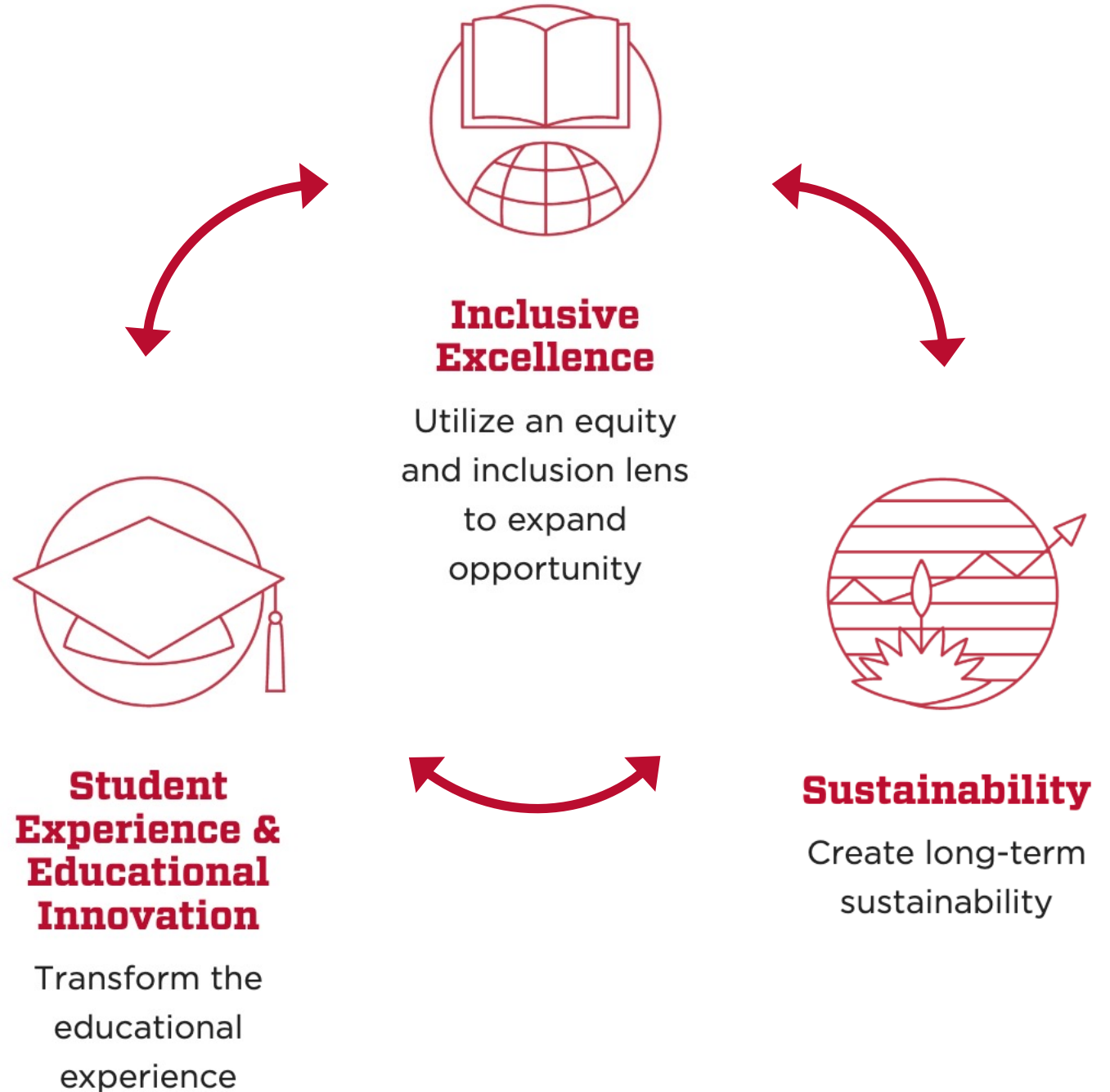
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STARTUP COMPANIES
FOUNDED IN FY20-24

1,088

STUDENT RESEARCHERS
SUPPORTED IN FY24

Relevant goals (for this meeting) in the UNM strategic plan



UNM College of Arts & Sciences

- 24 Departments, 8 College-level Research Centers
- Relevant efforts and goals within the College:
 - Increased participation rates of **freshmen and sophomores** in research
 - Develop **partnerships and collaborations for knowledge sharing** with New Mexico and global communities
 - Form partnerships with institutions and organizations outside UNM to create **reciprocity in learning experiences** and community projects
 - **Integrate service and experiential learning** into the curriculum, encouraging students to apply their academic knowledge to real-world challenges in the New Mexico communities and elsewhere

ASPIRE Center



Mission

**Advancing our capacity to
measure, analyze, and respond
to the lived environment**

- College-Level Center
- 10 affiliate faculty and staff
- 40 affiliated undergraduate and graduate students
- 3 academic units represented:
Geography and Environmental
Studies, Earth and Planetary
Sciences, Biology



ASPIRE Goals



1. Provide IT, equipment, and administrative support for ASPIRE to thrive
2. Foster and grow the ASPIRE community
3. Become the geospatial research hub at UNM and beyond
4. Build expertise in relevant, collaborative research areas, and
5. Be a leader in geospatial education and workforce training.



A view of Comb Ridge looking north from the San Juan River on the Navajo Nation near Bluff, UT. This river trip gathered Indigenous and settler scientists, community members, and educators to discuss indigenizing geoscience within the Colorado Plateau. Photo credit: Cam Chavez Reed.

ASPIRE research



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Research grants

- Select current and recent grants:
 - Quantifying Ecosystem exports across Space and Time (PI: Alex Webster; sponsor: Dept of Energy)
 - UAV and camera trap imagery identification and assessment (PI: Chris Lippitt; sponsor: US Fish and Wildlife Service)
 - A collaborative Human-Centered Design approach towards new NASA products for satellite snow monitoring (PI: Yolanda Lin; sponsor: WWAO)

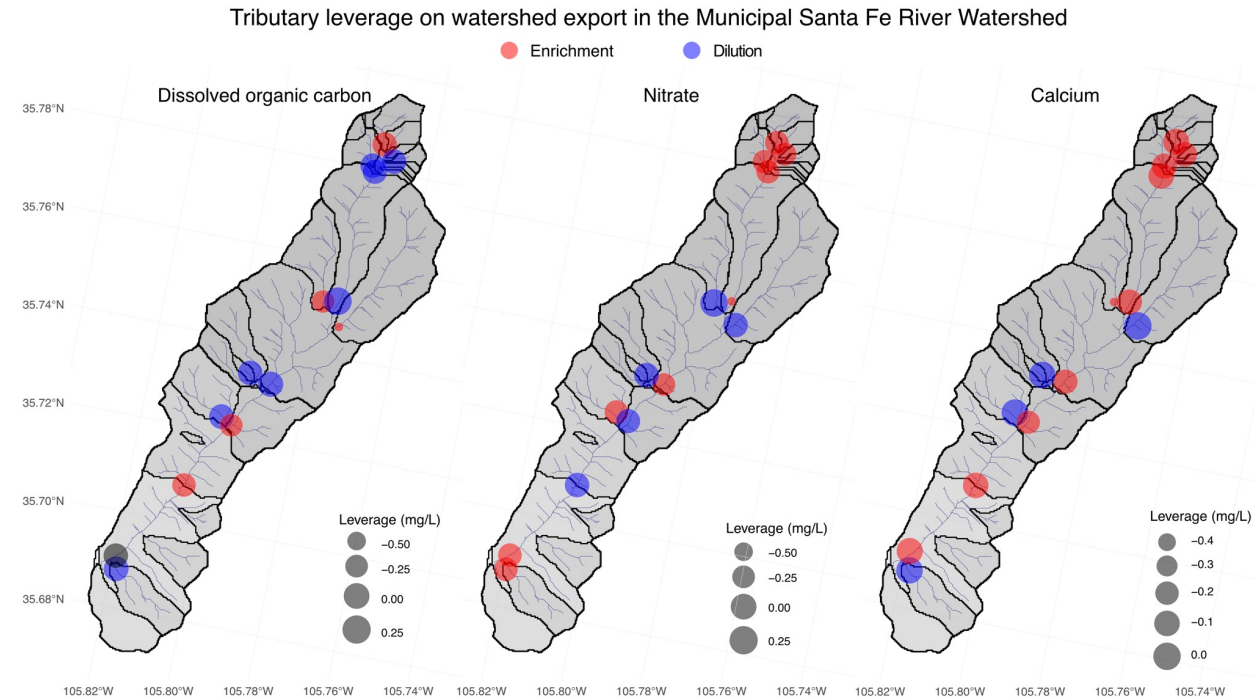


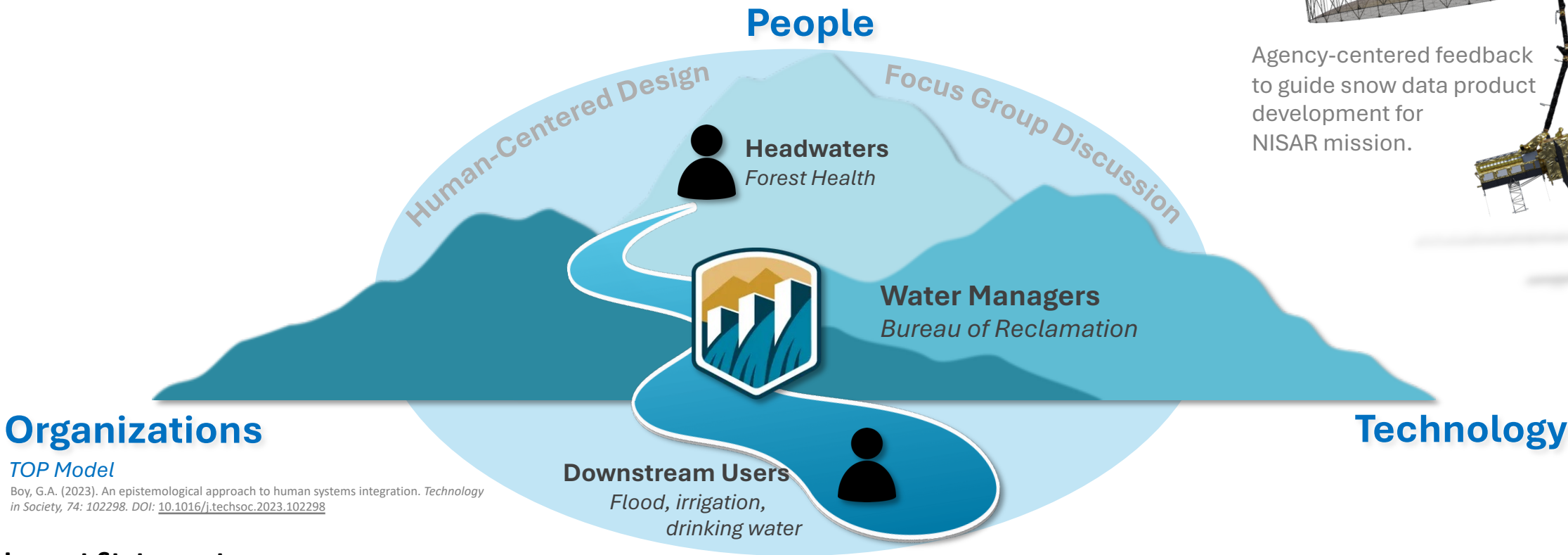
Image credit: Alex Webster



A collaborative Human-Centered Design approach towards new NASA products for satellite snow monitoring



Dr. Yolanda Lin, Department of Geography and Environmental Studies, University of New Mexico
Adrian Marziliano, PhD Student, Department of Civil, Construction, and Environmental Engineering, University of New Mexico
Emma Metcalf, Resource Management Coordinator, Albuquerque Area Office, Bureau of Reclamation
Chris Frans, Water Availability Research Coordinator, Research & Development, Bureau of Reclamation



Impact Statement

The mission for this project is to utilize human-centered design (HCD) and build a lasting relationship with water supply managers and receive agency-centered feedback to assist in the technology transfer between satellite snow retrieval researchers and data user decision makers. The impact will be an improvement in access and usability of runoff prediction and streamflow generation, which will allow the agency to better manage and deliver water to Rio Grande Basin users.

ASPIRE education

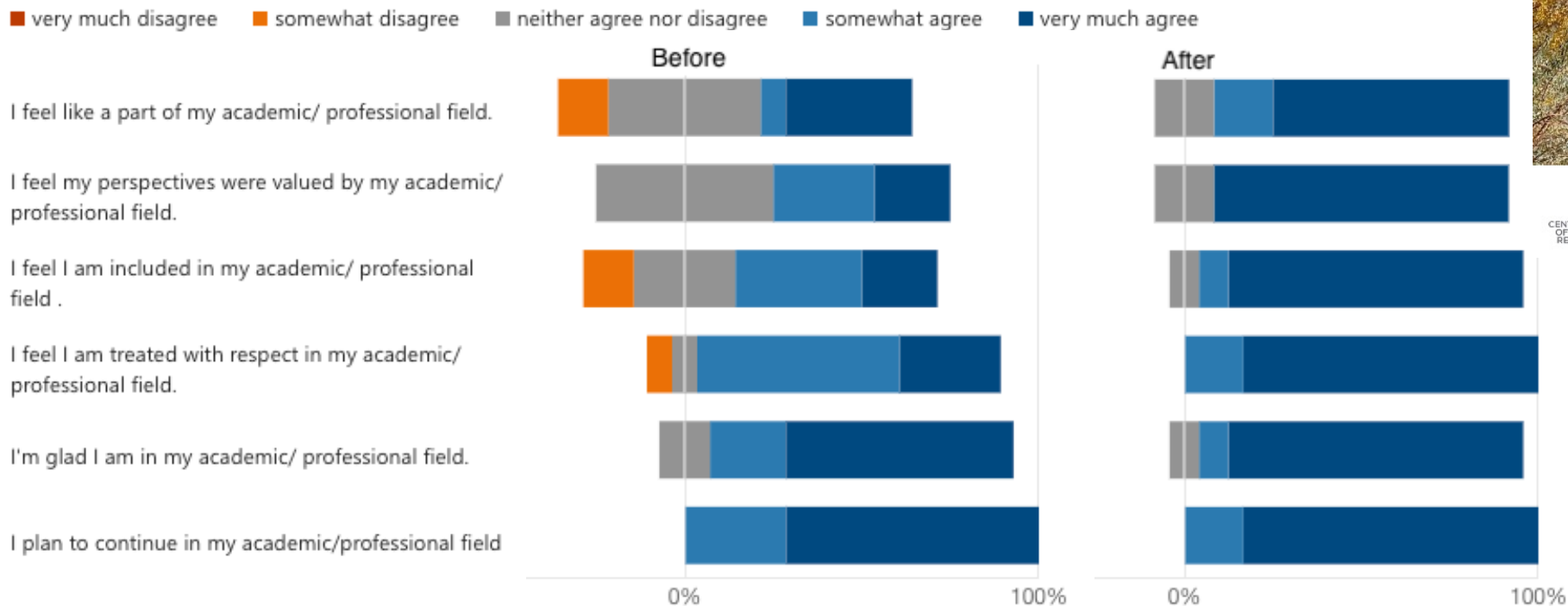


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UNM ESCAPE (Earth Sciences Computing And Programming Experience)

- 2-week workshop for 15-25 undergraduates, yearly since 2022
- Students learn python programming, Earth science data analysis, visualization, field experience, and build a network of support
- Over 60 applicants last year!
- Contact **Eric Lindsey (eol@unm.edu)** to contribute a dataset & collaborate with UNM undergrads!



ESCAPE:

EARTH SCIENCES COMPUTING & PROGRAMMING EXPERIENCE

AUGUST 4-8, 2025

Up for something new this summer? Apply to join our week-long end-of-summer undergraduate research workshop!

Learn about:

- Field data collection and timeseries analysis
- Python programming and data visualization
- Careers in environmental & Earth science

Apply now, no experience required!

Apply online by June 15:
bit.ly/unm-escape



Questions? eol@unm.edu or lworthington@unm.edu



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August 4-8, 2025
UNM Main Campus



DEPARTMENT OF
EARTH & PLANETARY
SCIENCES

Workshop organizers: Eric Lindsey (EPS),
Lindsay Worthington (EPS), Yolanda Lin (GES),
Chris Lippitt (GES), Cari Hushman (Ed. Psych.)

LAUNCH

Learning about the unwritten norms for careers in higher education

- 2 day workshop for late stage PhD student and Postdoctoral researchers
- How to apply for academic jobs, and what else you can do with an Earth/environmental science (and adjacent) PhD outside of academia
- Based in ABQ and want to talk about your academic and professional path? Let me know!
- **Contact: Yolanda Lin**
[ycl@unm.edu]



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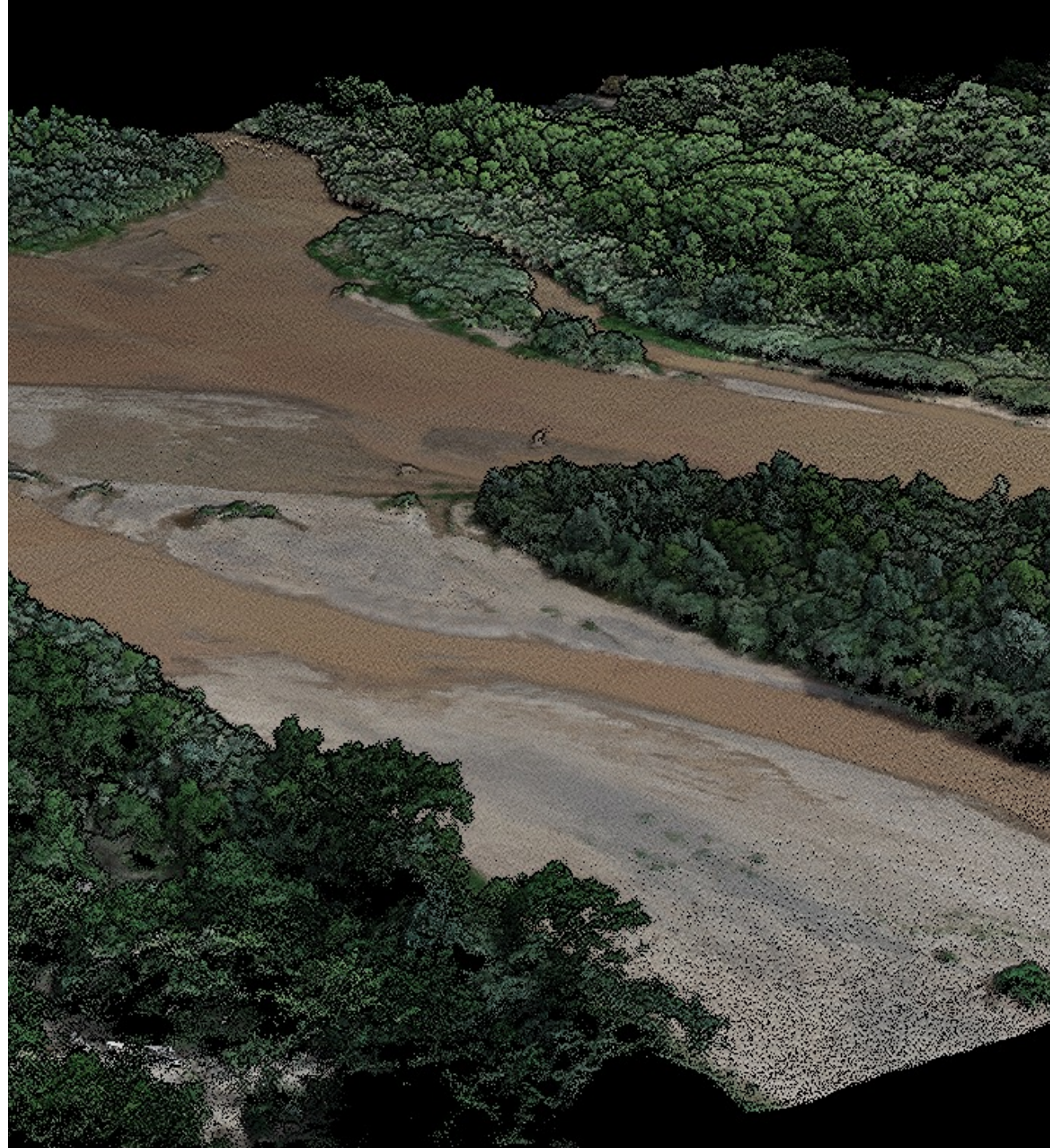


This post-processing view in DJI Terra of the Bosque looking Northeast near Alameda is from the DJI M300 L1 sensor configuration. ESCAPE Students were able to take part in seeing the workflow, including mission planning, data acquisition, and data manipulation. Image credit: Miguel Martinez

ASPIRE services



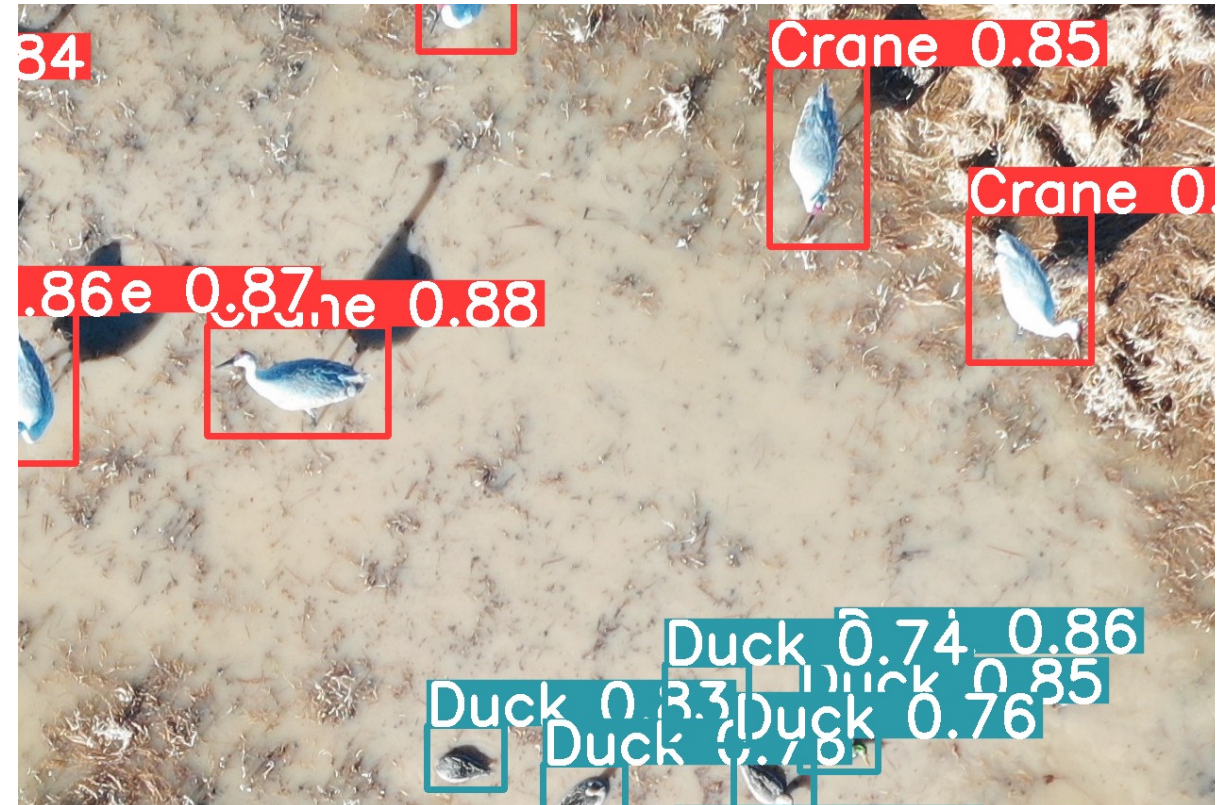
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ASPIRE Services

aspire.unm.edu/services

- Image acquisition
 - Manned Airborne RGB
 - Manned Airborne CIR
 - UAS RGB
 - UAS Multispectral Basic
 - UAS LiDAR
- Field surveys
 - RTK Field Survey
 - Non-RTK GPS field survey
 - Field Spectra (350-2400nm) collection
- Contact:
aspire.services@unm.edu



Snow depth and permittivity instruments were added to the Sandia10k weather station to study snowmelt timing and seasonal snow variability of this shallow but persistent snowpack. Efforts are currently being made to include the station in New Mexico State University's ZiaMet weather station network to ensure long-term maintenance and public data access

Photo credit: Adrian Marziliano

ASPIRE partners at UNM



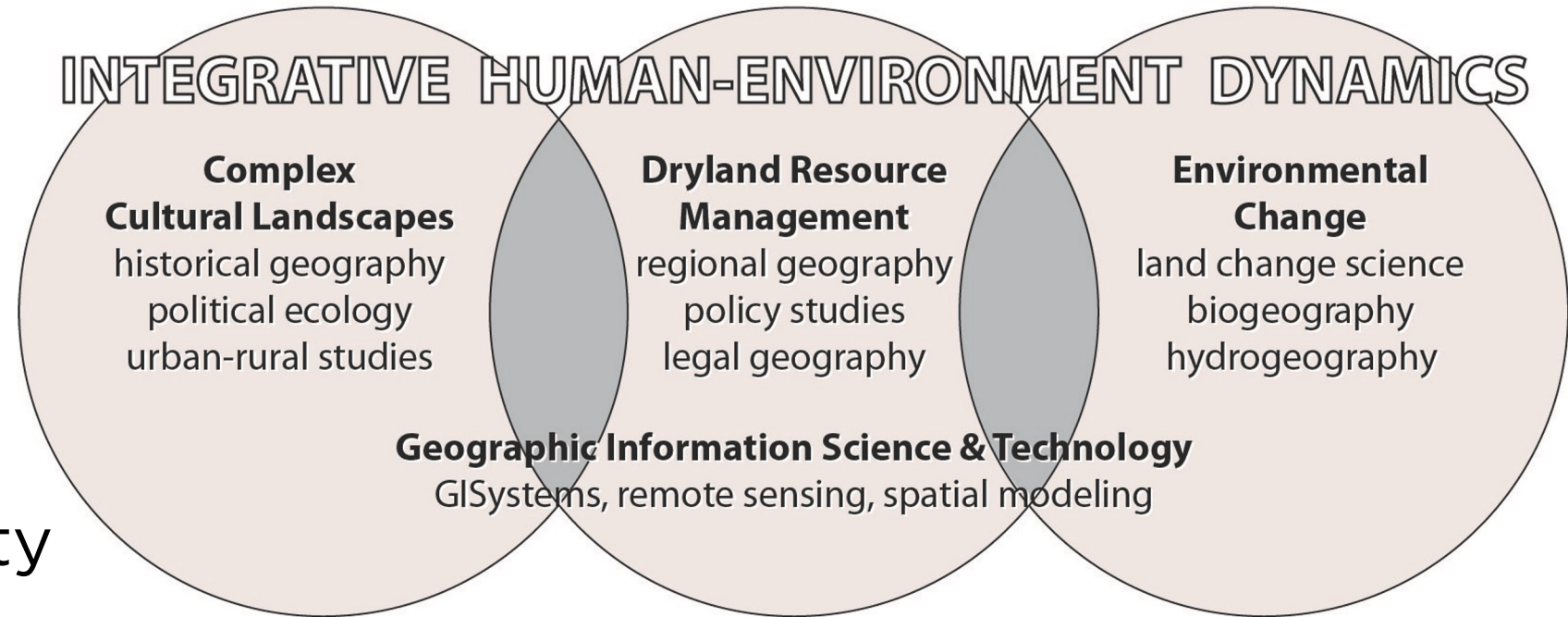
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DEPARTMENT OF GEOGRAPHY & ENVIRONMENTAL STUDIES

Degrees Offered:
PhD, Geography
M.S., Geography
B.S., Geography
B.A., Geography
Minor, Geography
Minor, Sustainability
Studies

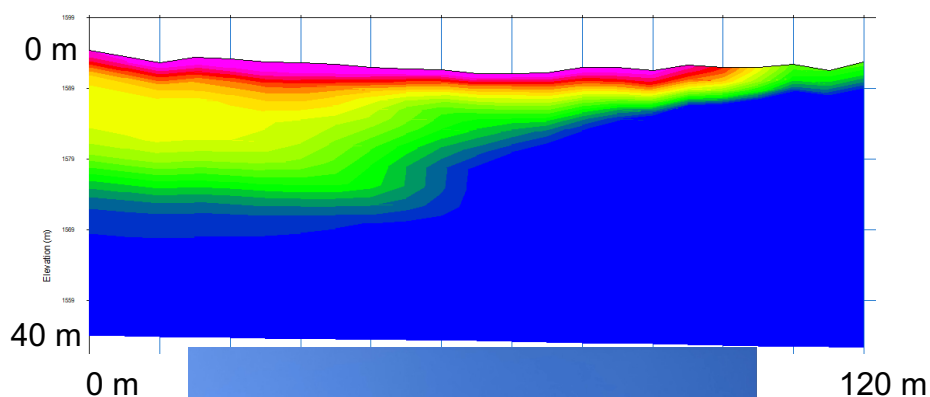


Newly approved for AY25-26:
B.A., Sustainability & Environmental Studies
Graduate Certificate, Environmental Sensing, Data, and Modeling

Geology, geophysics, geomorphology, geochemistry

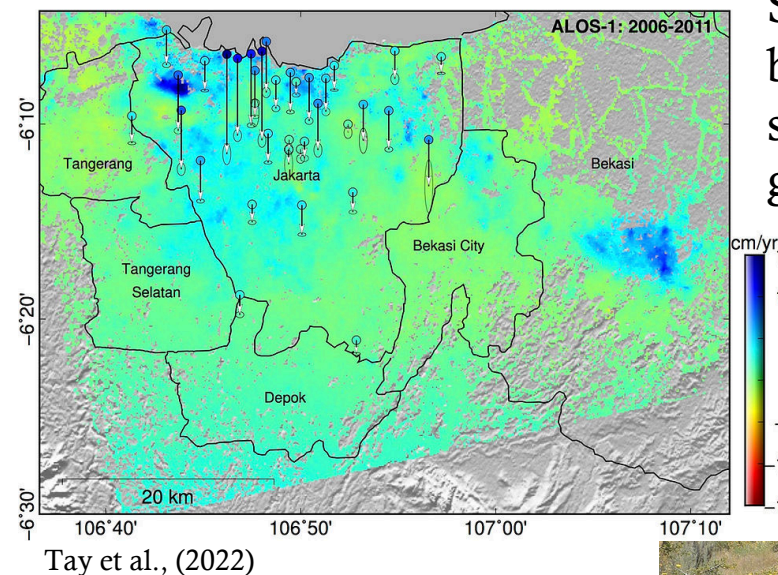
Subsurface imaging, ground deformation,
fluid-rock interactions, ground-
water/surface water connections

Satellite and ground-
based measurement of
subsidence related to
groundwater fluxes

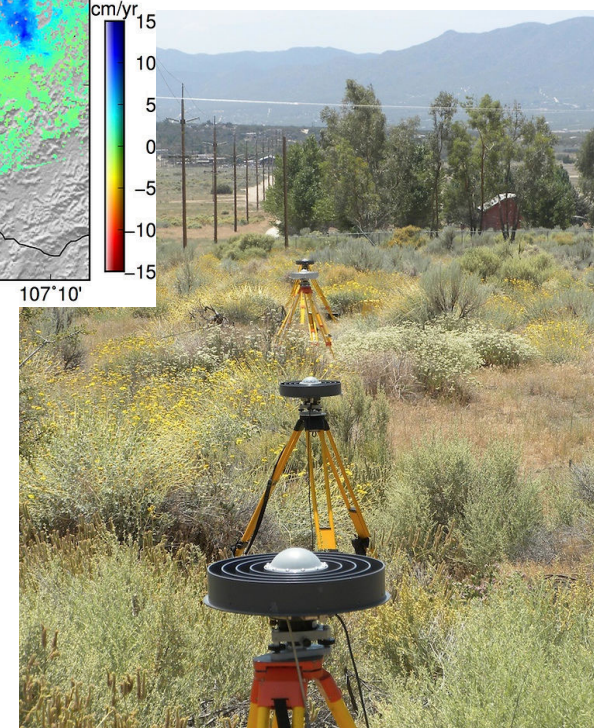


Example from L. Worthington

Unknown faults and potential fluid/gas
pathways east of Socorro fault



Example from E. Lindsey



Water Resources Program

- Graduate Professional MS degree
- Focused on the science & policy of water
- Interdisciplinary program draws from faculty from multiple departments across the university
- Regionally prominent center of expertise on water-related issues & training for environmental professional
- Promotes fair, healthy, and sustainable solutions to water-related challenges in New Mexico and the Southwest
- **Contact: Dr Becky Bixby, bbixby@unm.edu**

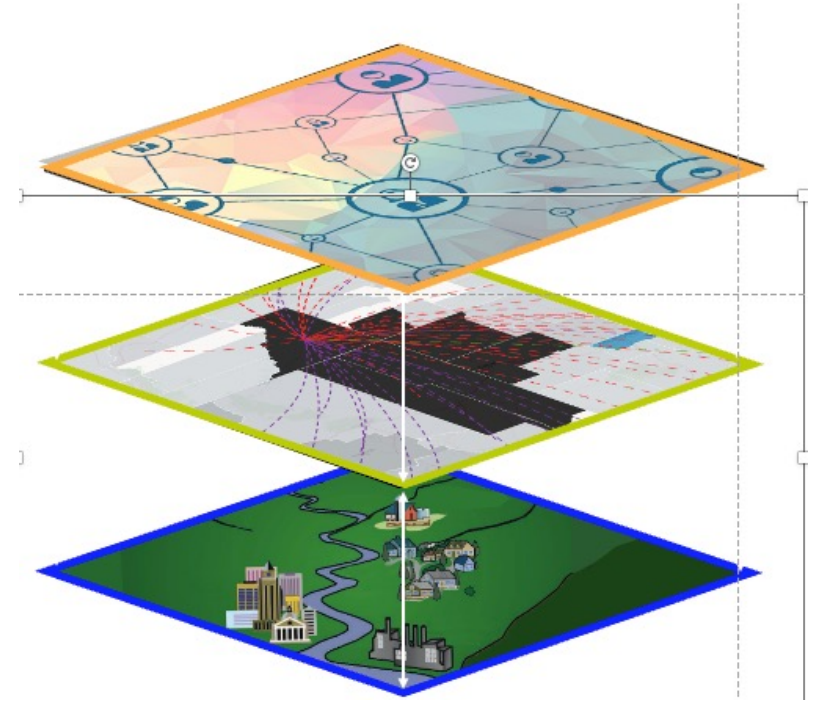




INTERMOUNTAIN WEST TRANSFORMATION NETWORK



Grant #2115169

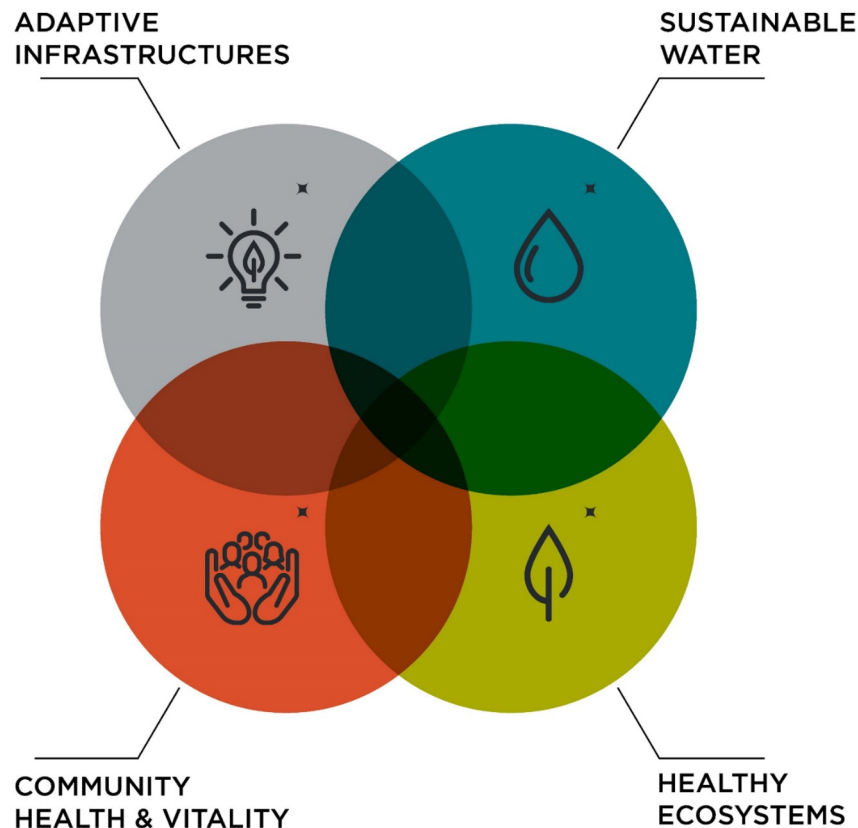


The goal of the **Intermountain West Transformation Network (IMW-TN)** is to build capacity for adaptations and guided transformations towards **sustainable regional systems** through innovative solutions.



Contact: Melinda Morgan, PI: mhbenson@unm.edu

Mission: Enhance the resilience of communities, ecosystems, and the economy to climate change through inclusive and equitable research, education, and collaborative partnerships in New Mexico and drylands worldwide.



Goals:

1. Build capacity for novel transdisciplinary research to increase climate resilience
2. Inclusively and equitably train and educate a diverse next generation

Selected Projects:

- Energized Watershed Regional Innovation Engine
- UNM Climate and Health Allied Network for Geospatial and Environmental Science (CHANGES) Center
- Sevilleta Long-Term Ecological Research (SEV-LTER)
- STEM Pathways & Research Alliance

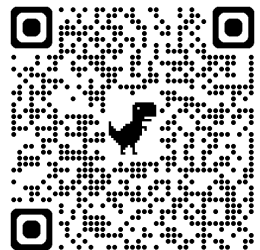
Contact: Debbie Lee, Sr Program Manager, debbieylee@unm.edu

<http://arid.unm.edu>

Undergraduate Water Science Communication Fellowship

Contact: Anjali Mulchandani anjalim@unm.edu

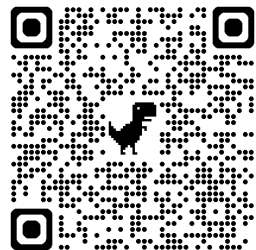
- Objective: Undergraduate students new to research develop a **communications piece** based on their mentor's research
- Cohorts of 10-15 students recruited every year from a variety of majors (engineering, biology, environmental science, geography, economics, political science, statistics)
- 2022–2024, 26 UNM UG engaged in research, >25 mentors
- 2025, program expanded, 44 UG across 5 universities (UNM, Arizona State University, Wichita State University, Syracuse University, Morgan State University), mentors include **water utilities and agencies**
- Funding: EPA Innovative Water Infrastructure Workforce Development Program, UNM ARID, UNM Foundation sponsor



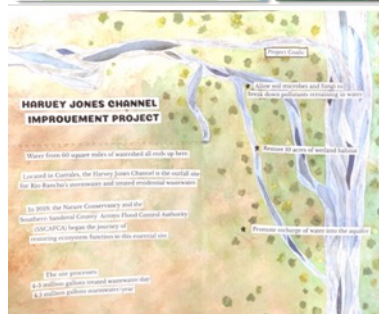
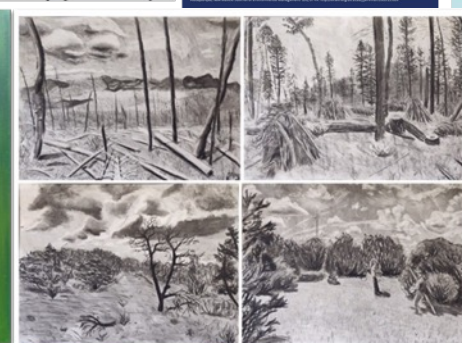
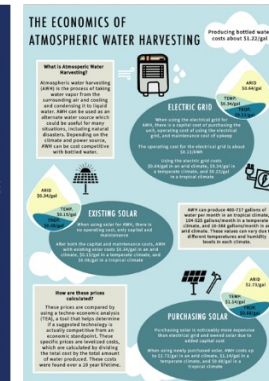
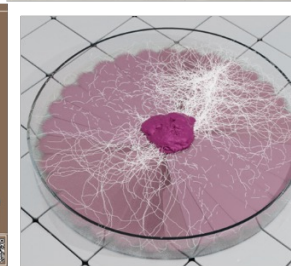
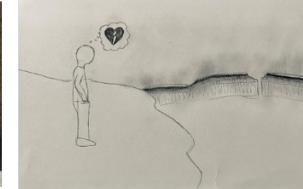
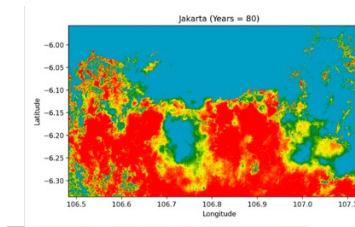
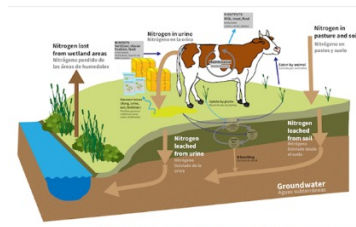
2023 Projects



2024 Projects



2025 Projects



ASPIRE partners beyond UNM



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Photo credit: Marisa Repasch



EXCITES Network

Expanding careers through inclusive transitions in environmental science



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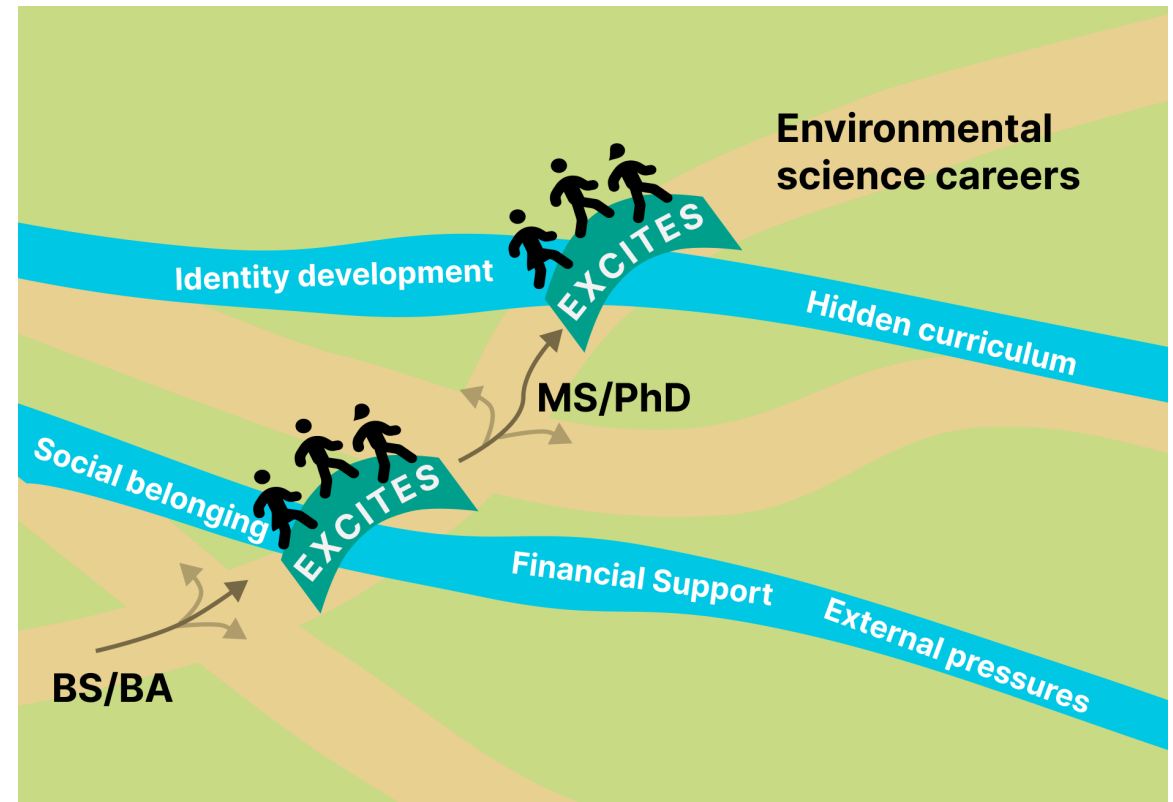
The EXCITES Network facilitates formal and informal pathways for Earth & Env Science students at MSIs in the Southwest across undergraduate, graduate, and professional transitions

- **Professional partners:** Bohanan Huston, Sandia, USGS, GeoSystems Analysis, Inc., Explora, UNM Earth Data Analysis Center
- **Academic partners:** UNM, NMSU, NMTech, NM Highlands, Texas Tech, UTEP, SDSU

Join EXCITES!

Learn more: www.excites.network

Contact: Yolanda Lin [ycl@unm.edu]





Questions? Comments?
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