



WESTERN REGIONAL PARTNERSHIP

Tribal Engagement Committee

October 2025

ENHANCING RESILIENCE TO
AVOID CASCADING DISASTER



WESTERN REGIONAL PARTNERSHIP

Today's Agenda



- **Welcome and Introductions**
- **Featured Presentations:**
 - **Native American Fish & Wildlife Society Update** by Dr. Julie Thorstenson, Executive Director, Native American Fish and Wildlife Society
 - **Integrating Geospatial and Environmental Sciences to Advance Community-Driven Tribal Water Research** by Joe Hoover, Assistant Professor, Department of Environmental Science, U of A Indigenous Resilience Center- and - Anupama Sethuraman, Department of Environmental Science (PhD Student, U of A)
- **Next Steps and Actions**
- **Around the Phone Updates**





Julie Thorstenson, Ph.D.

Executive Director
Native American Fish and
Wildlife Society



- **Executive Director, Native American Fish and Wildlife Society**
 - Serves as chief administrator under the guidance and direction of the NAFWS board of directors to achieve the organization's mission to assist Native American and Alaska Native Tribes to conserve, protect, and enhance their fish and wildlife resources.
- **Previously:**
 - Founder 4T Consulting (healthcare planning, organizational management, wildlife and environmental surveying and planning, grant writing and management services)
 - Clinical Services Administrator, Indian Health Services
 - CEO, Cheyenne River Sioux Tribe Health Department
 - Wildlife Habitat Biologist, Cheyenne River Sioux Tribe
 - Adjunct Professor at Oglala Lakota College
- **Education:**
 - Ph.D., Biological Science, South Dakota State University
- Citizen of the Cheyenne River Sioux Tribe

Governmental Affairs Updates

Julie Thorstenson, PhD
Executive Director



Challenges

- **No base funding for Tribal Fish and Wildlife**
- Loss of Federal partners and institutional knowledge
- Break down of communication internally and externally in Federal agencies
- Lack of Economic Impact data collectively for Tribes
- Fast pace and volume of changes
- Educating on Tribes unique political class

2025 Governmental Affairs Work

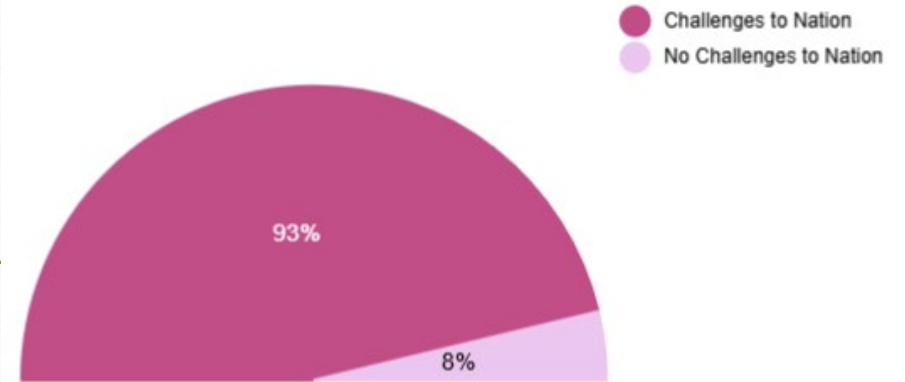
- Tribal Fish and Wildlife Professionals surveyed regarding impacts of Executive Orders (3/7/25, 4/18/25 and 9/31/25)
- Tribal Fish and Wildlife Funding fly-in and briefing (March 2025)
- Tribal Fish and Wildlife Funding fly-in (November 2025)
- Increased direct technical assistance since Jan 20, 2025
- Appropriations Requests
 - NAFWS Operations & Maintenance
 - Conservation Law Enforcement Officer Funding

Tribal Nation Survey: Impacts of EO 3/7/25

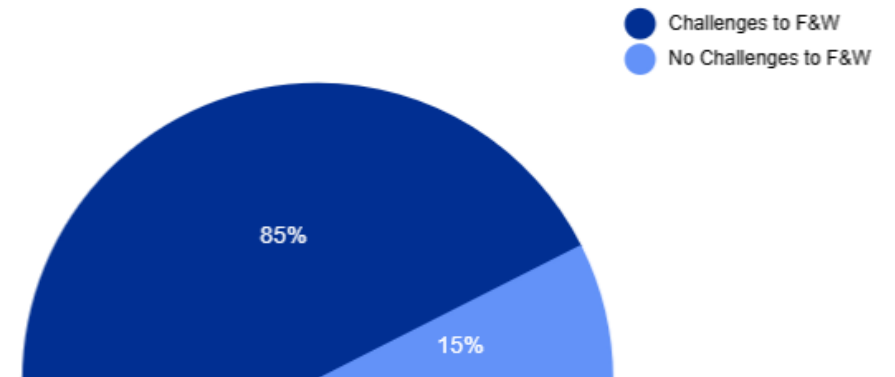
- Surveyed over 400 contacts
- EO impacts in general
- EO impacts to fish and wildlife programs
- Describe any challenges

95 responses from 80 Tribes

Challenges to Nation Overall?



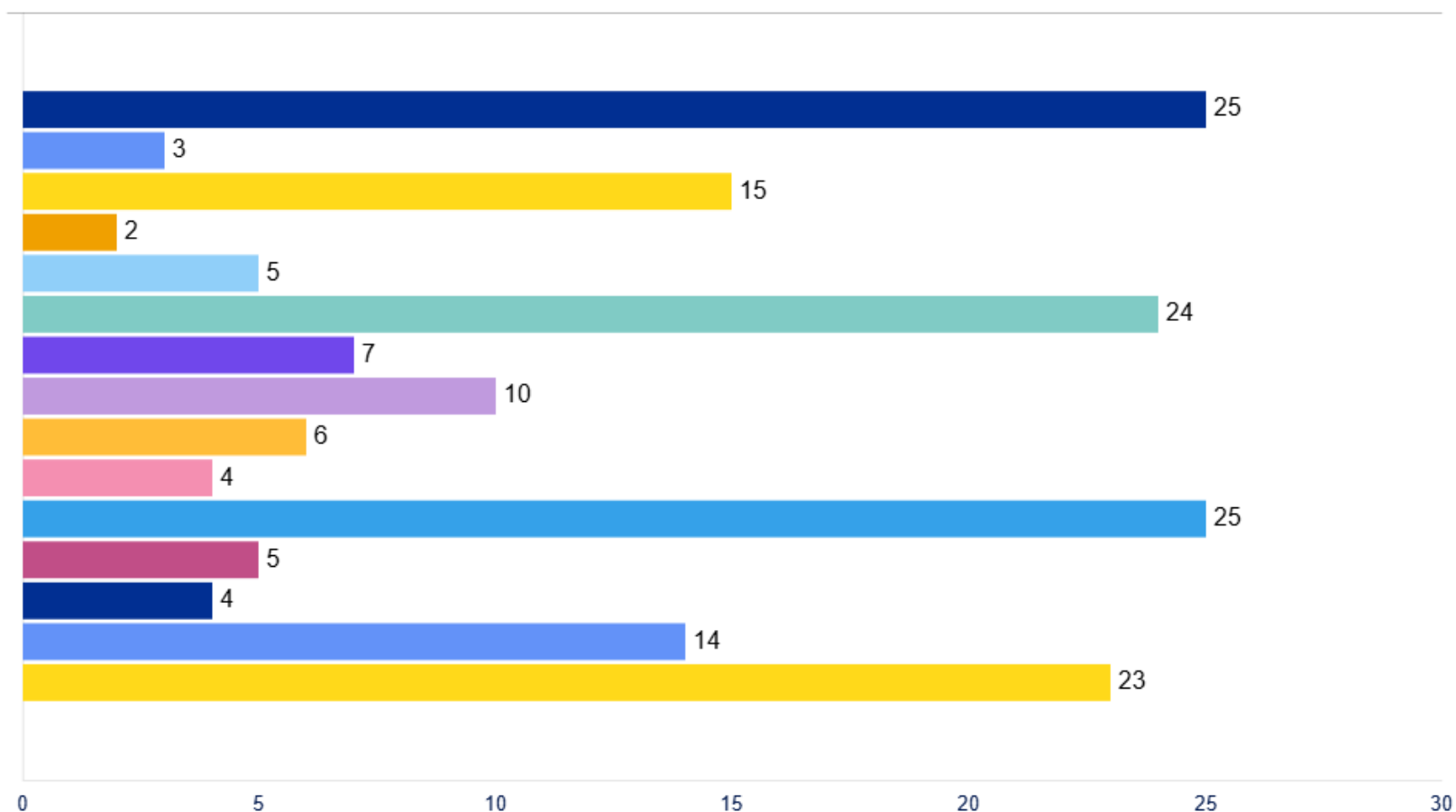
Challenges to F&W Program?



<i>Tribes who mentioned that their Fish and Wildlife programs are entirely federally funded</i>	<i>Tribes who mentioned that their Fish and Wildlife programs are threatened</i>	<i>Tribes who mentioned that their ability to retain staff is threatened</i>	<i>Tribes who mentioned that their treaty and subsistence rights are threatened</i>
10	15	23	14

Impacts of Executive Orders Tribes Mentioned

- Federal Partner staff terminations
- Concern for the security of base funding
- F&W Program is Threatened
- Feds have been barred from communicating
- Food Security is Impacted
- Impacts to timelines and contracting
- Increased Stress/Distress Among Staff
- Issue with Reimbursable Funds
- Matching Funds Are Threatened
- Partnerships are Threatened
- Services from partner agencies have been lost
- RFPs and Future Funding were Revoked
- Travel Freezes Impacting Staff
- Treaty and Subsistence Rights are Threatened
- Tribe's Jobs and Staffing is Threatened



Tribal Nation Survey: Impacts of EO 4/18/25

- Surveyed over 400 contacts
- EO impacts in general
- EO impacts to fish and wildlife programs
- Asked more quantitative questions

47 Tribes responded

Tribes who selected “Yes”, they have experienced **freezes** of awarded grants and federal funding.

60%

Amount Frozen to Respondent Tribes

\$56,617,398.00

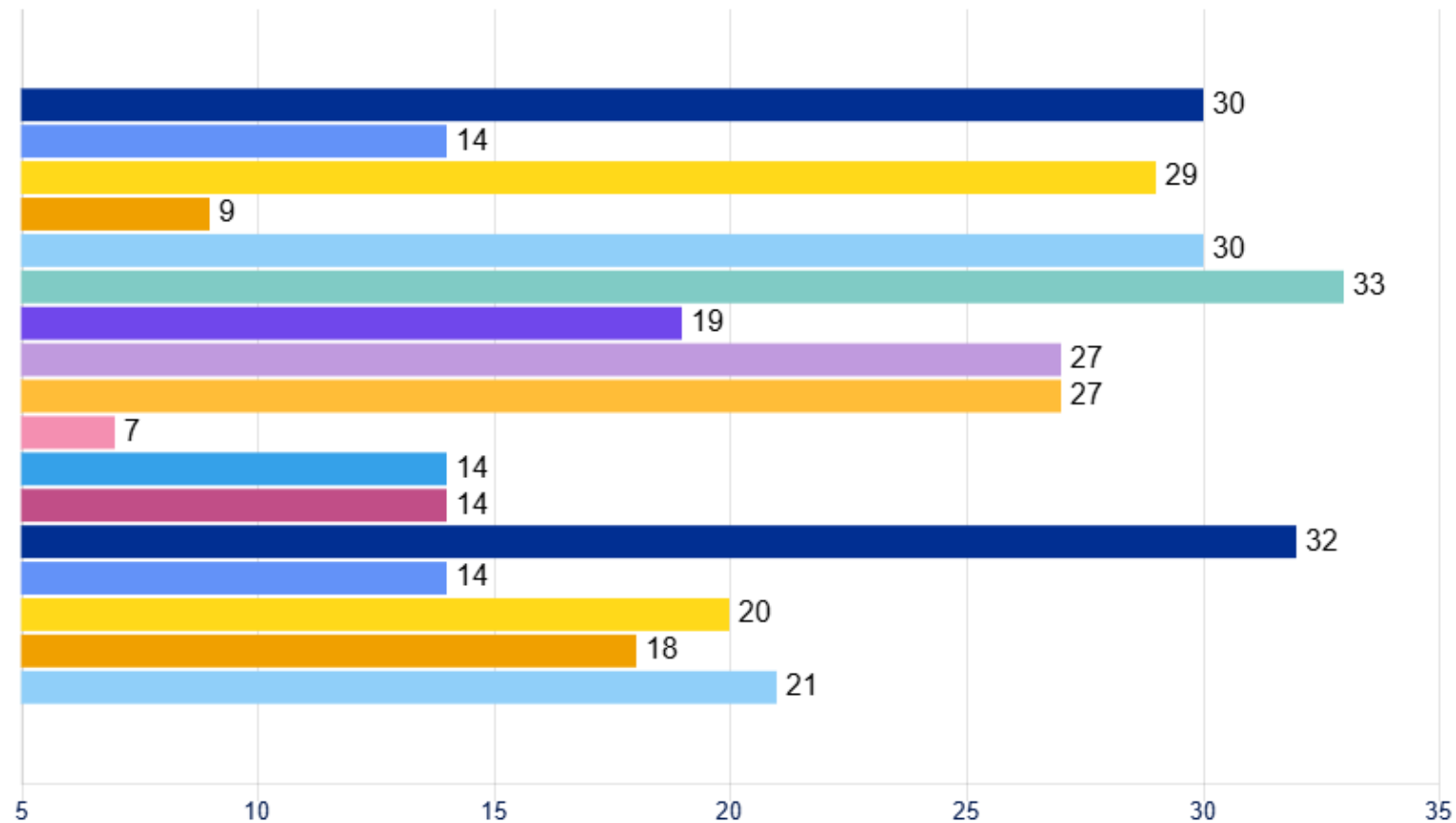
Tribes who selected “Yes”, they have experienced **cancellation** of awarded grants and federal funding.

26%

Amount Cancelled to Respondent Tribes

\$5,275,151.00

- Freezes of awarded grants
- Cancellations or delays of non-federal funding
- Threats to partnerships on funded projects
- Threats to matching funds
- We have reimbursement-based projects
- Project timeline and contracting issues
- Cancellation or delays of future funding opportunities.
- Program fully federally funded
- Program threatened by EOs
- Program will lose staff
- Tribe will lose staff
- Tribe impacted by travel freezes
- Loss of services from federal partners
- Feds told not to communicate
- Impacted by federal travel freezes
- Treaty/subsistence rights threatened
- Food security threatened



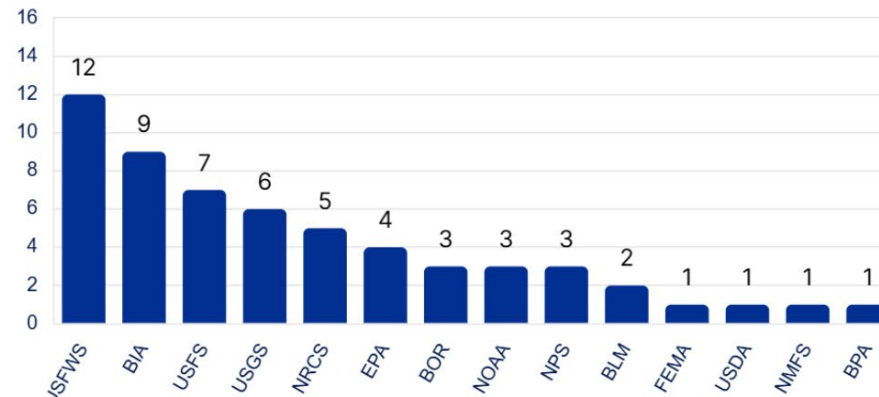
Response - Tribes who answered "Yes" to each statement	Questions about Impacts to <u>Our Fish and Wildlife Program</u>
53% 25 Tribes	<i>Our Fish and Wildlife program is fully or nearly-fully federally funded.</i>
53% 25 Tribes	<i>Our Fish and Wildlife program is being threatened by Executive Orders.</i>
15% 7 Tribes	<i>We expect to lose staff positions from our Fish and Wildlife Program.</i> <i>The 7 Tribes who responded "Yes" estimated they would lose 15 positions from their Fish and Wildlife Programs.</i>
30% 14 Tribes	<i>We expect to lose staff positions from our Tribe overall.</i> <i>The 14 Tribes who responded "Yes" estimated they would lose 52+ positions from their Tribes overall.</i>
28% 13 Tribes	<i>Our Tribal staff is impacted by travel freezes.</i>

Tribal Nation Survey: Impacts of Executive Actions 9/30/25

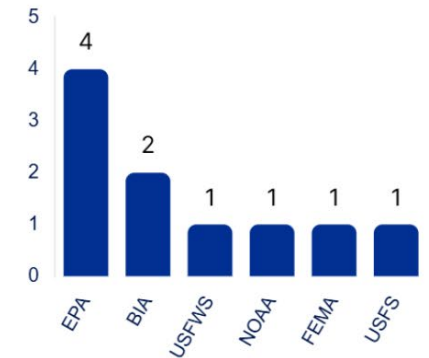
- Surveyed over 800 contacts
- EO impacts in general
- EO impacts to fish and wildlife programs
- Asked more quantitative questions

39 Tribes responded

Loss of Services from Agency Mentioned

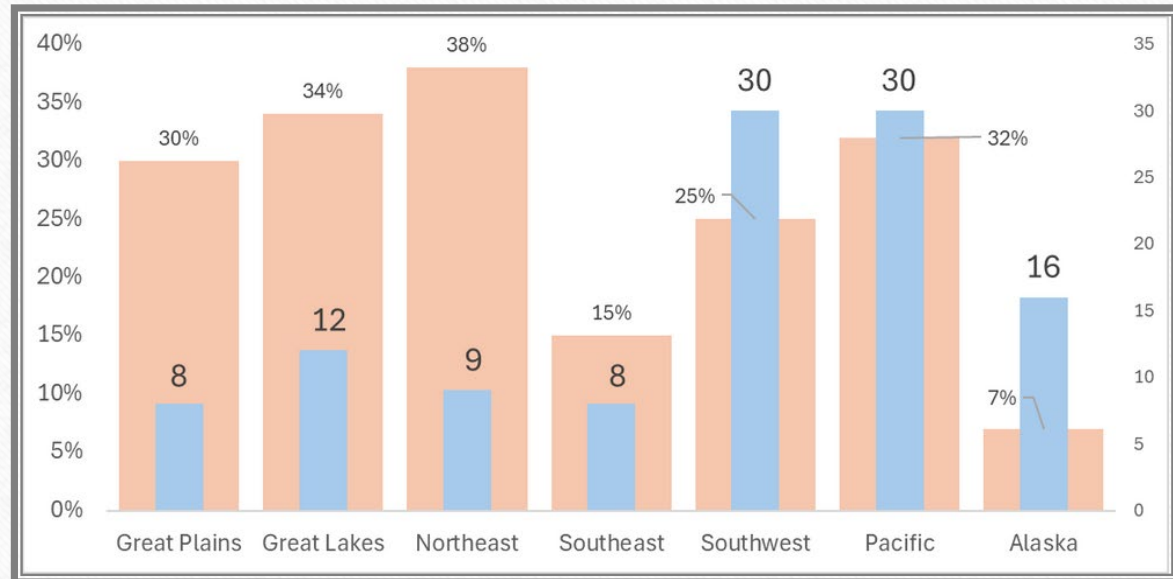


Tribe told Agency couldn't communicate with them



2025 Executive Action Impacts to Tribes: A Fish and Wildlife Snapshot

- 800 Tribal Fish and Wildlife contacts Feb, Apr, and Sept
- 113 Tribes responded to at least one of the three surveys representing a 20% response rate.
- Tribes in every NAFWS region responded to at least one survey.



Quick Glance

- Tribes who selected “Yes” to whether they had experienced freezes of awarded grants and federal funding at least once between Jan 20-Sept 30, 2025

61% (69 Tribes)

Feb: 46 Tribes (56%): **\$20,809,005**

Apr: 28 Tribes (60%): **\$56,617,398**

Sept: 12 Tribes (31%): **\$6,202,909**

- Tribes who selected “Yes” to experiencing a cancellation of awarded grants and federal funding at least once between Jan 20-Sept 30, 2025

30% (34 Tribes)

The amount of awarded funding reported as having been cancelled to Tribal Fish and Wildlife Programs this year is at least

\$53,261,901

Tribal fly-in and briefing

- March 7, 2025
- 8 Tribal Fish and Wildlife Professionals and 3 NAFWS Staff
- Briefing on Tribal fish and wildlife funding for ~20 attendees
- Met with 30 offices and 5 committees



Opportunities

- Increase Tribal self-determination and/or self-governance contracts or co-management
- Dedicate annual funding for CLEO programming, enhancement and training
- Land & Water Conservation Fund – amend eligibility or establish Tribal set aside
- Compliance regulations reform – Tribal input
 - ESA
 - NEPA

Legislative Opportunities

- Recovering America's Wildlife Act
- America's Wildlife Habitat Conservation Act
- Land and Water Conservation Fund
- Farm Bill



Initial EO Survey Results



Follow Up EO Survey Results

Resources

FOLLOW US ON OUR WEBSITE/SOCIAL MEDIA



nafws.org



@nativeamericanfish
andwildlife



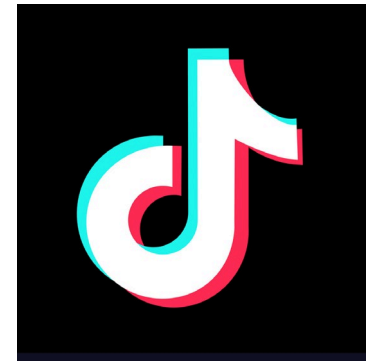
@nafws_insta



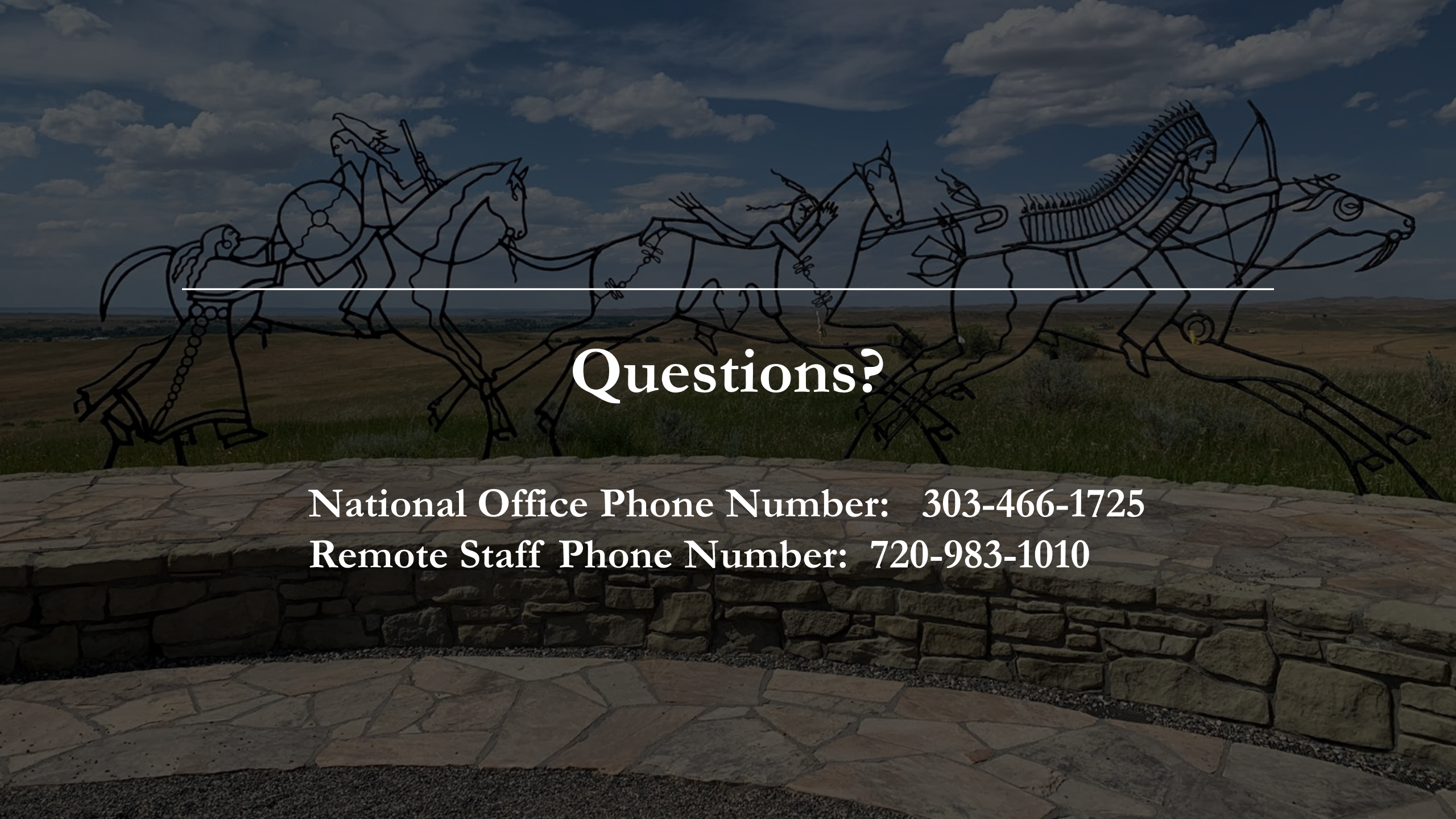
@native_wildlife



Native American Fish & Wildlife
Society



@nafwstiktok



Questions?

National Office Phone Number: 303-466-1725

Remote Staff Phone Number: 720-983-1010



Joseph Hoover, Ph.D.

*Assistant Professor,
Department of Environmental
Science*
University of Arizona



THE UNIVERSITY
OF ARIZONA

- **Assistant Professor, Department of Environmental Science, University of Arizona**
 - Specializes in the geography of water resources with a focus on patterns of exposure and health impacts in rural, underserved communities in the United States.
 - Core faculty affiliate with the Indigenous Resilience Center
 - Co-Director, Center for Native Environmental Health Equity Research
- **Previously:**
 - Assistant Professor at Montana State University - Billings
 - Research Assistant Professor at the University of New Mexico
- **Education:**
 - **Ph.D.** in Geography, University of Denver
 - **Masters** in Geography, University of Arizona
 - **Bachelors** in Environmental Sciences, Northwestern University

Integrating geospatial and environmental sciences to advance community-driven Tribal water research

Co Presented by Joseph Hoover, PhD, and Anu Sethuraman (PhD Candidate)

Western Regional Partnership Tribal Engagement Update

October 31, 2025

We respectfully acknowledge the University of Arizona is on the land and territories of Indigenous peoples. Today, Arizona is home to 22 federally recognized tribes, with Tucson being home to the O'odham and the Yaqui. Committed to diversity and inclusion, the University strives to build sustainable relationships with sovereign Native Nations and Indigenous communities through education offerings, partnerships, and community service.



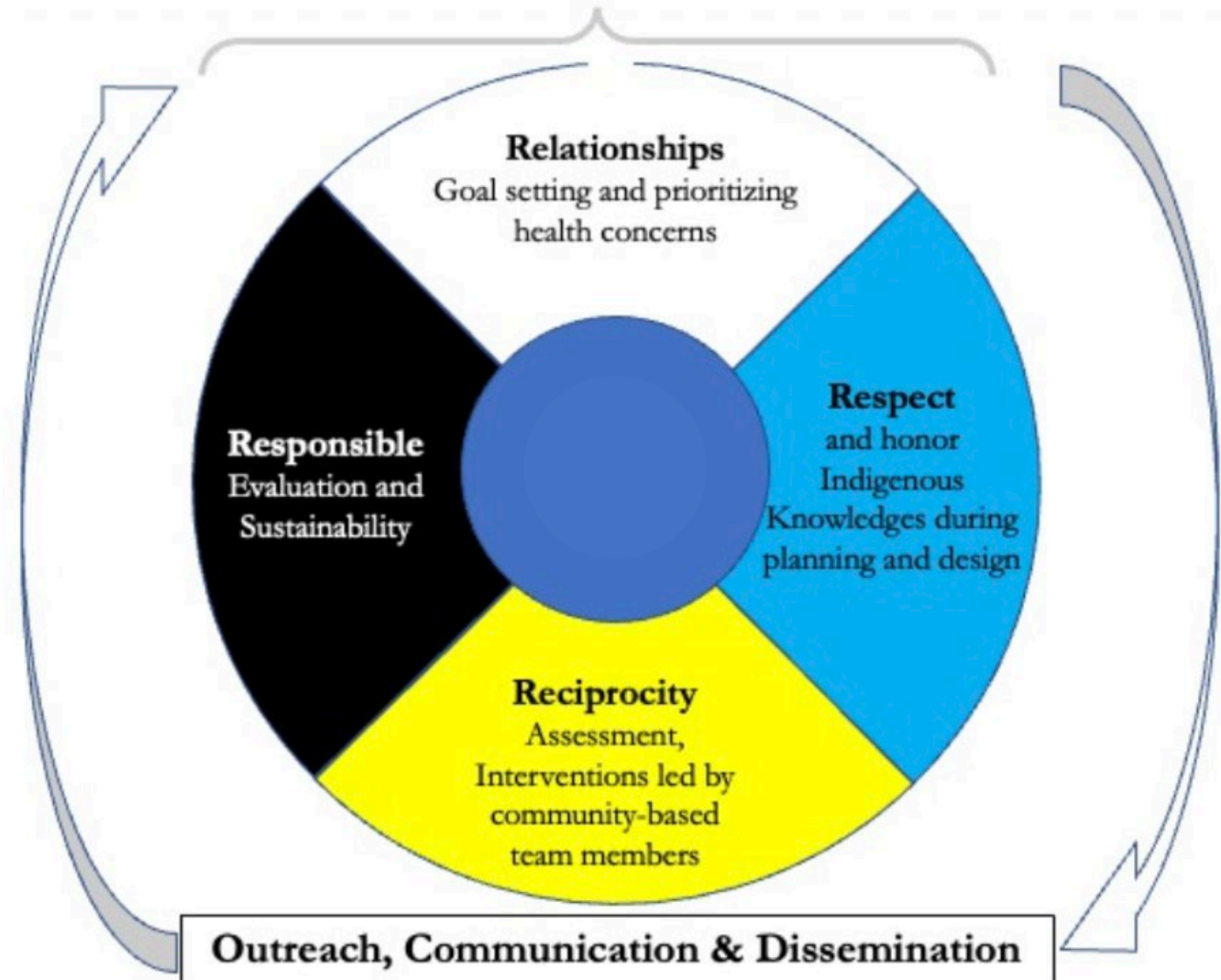
Research Philosophy

Each Native Nation has unique culture, traditions, language, history, and needs.

- Community engaged research projects co-developed with Indigenous Peoples (Ortiz et al 2020)
- Approaches and tools adapted to the specific needs of each community (Beans et al 2019)

Founded on respect of tribal sovereignty and Indigenous knowledges

- Indigenous data sovereignty principles
- Respect for and adherence to tribal research approval and dissemination processes (Manson et al 2011; Beans et al 2019)
 - Informed by my experiences with Tribal IRBs



Household water security - Unregulated Water Consumption

>45 million people in the US rely on UWSs for drinking water

- UWSs use is prevalent in some Indigenous communities

Public Health Concerns

- No requirements for water quality testing (Backer and Tosta, 2011)
- Undetected contaminants – trace metals, radionuclides, microbial, emerging contaminants (DeSimone et al., 2009)
- Limited awareness of groundwater contamination risk is common among UDWS users (Chappels et al., 2015; Flanagan et al., 2015; Walker et al., 2006)

Research Needs

- Well location and type
- Water quality characteristics
- Mechanisms of release
- Visualization and dissemination of data

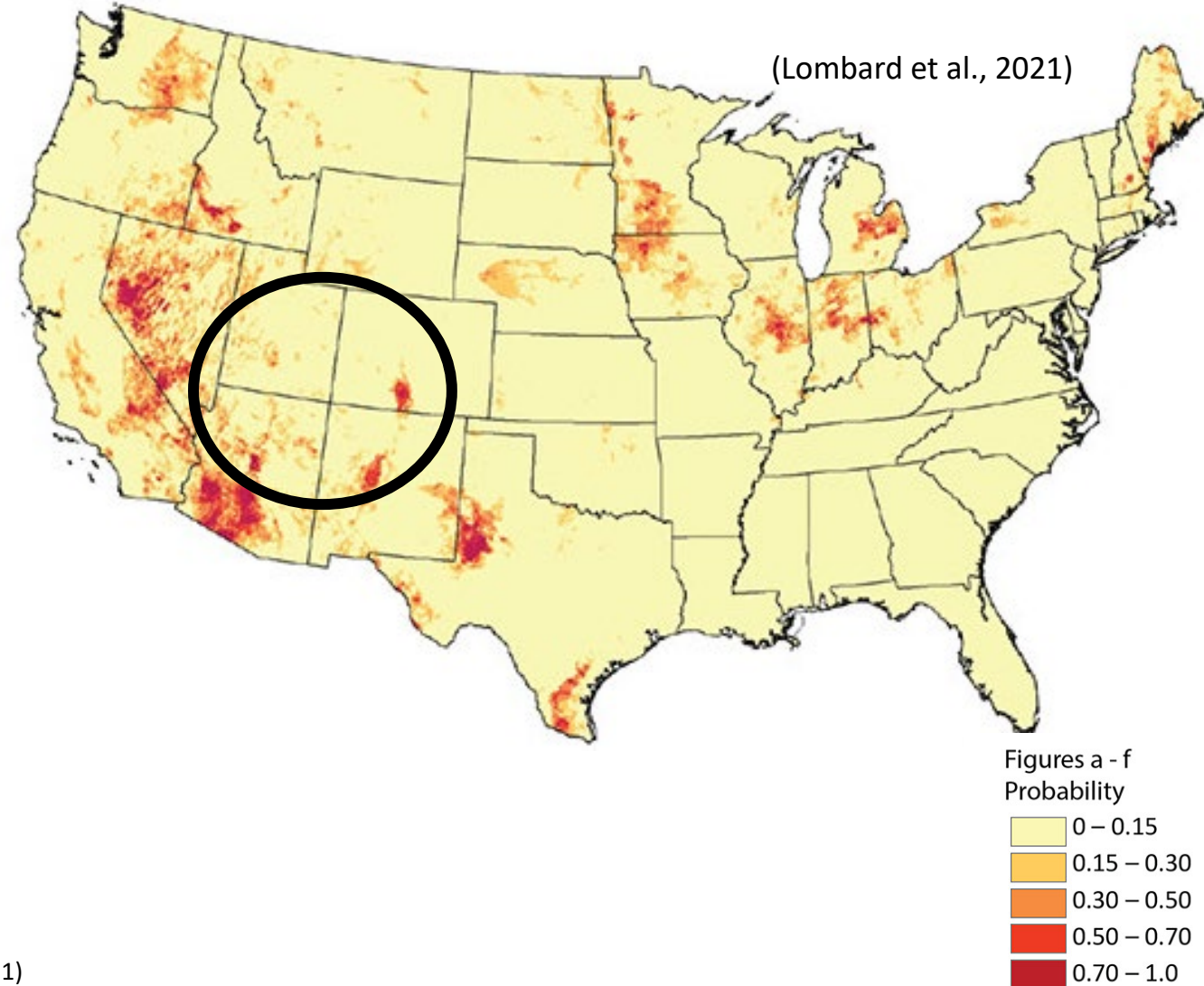


Groundwater Arsenic (As) in the United States

- Elevated groundwater As has been observed in areas across the US
- Concentrations of As increase east to west across US
 - Nonthermal water in the Colorado Plateau, have As concentrations exceeding $10 \mu\text{g/L}$ ¹⁸
 - “arsenic was the most commonly detected trace element at high (8%) and moderate (14%) concentrations” in aquifers of the Colorado Plateau²¹
- Many studies have conducted national groundwater As predictions^{19, 20}
- Lombard et al. (2021) made a groundwater As prediction map of the US and observed multiple areas throughout the southwest exceeding the MCL for As

Objective

- Evaluate large-scale spatial patterns of groundwater As across the Colorado Plateau and assess the variables most important for predicting these spatial patterns



¹⁸(Welch et al., 1988); ¹⁹(Lombard et al., 2021); ²⁰(Ayotte et al., 2017) ²¹Degnan & Musgrove (2021)

Arsenic in groundwater across the Colorado Plateau

Table: Summary statistics for arsenic groundwater concentrations by physiographic subsection

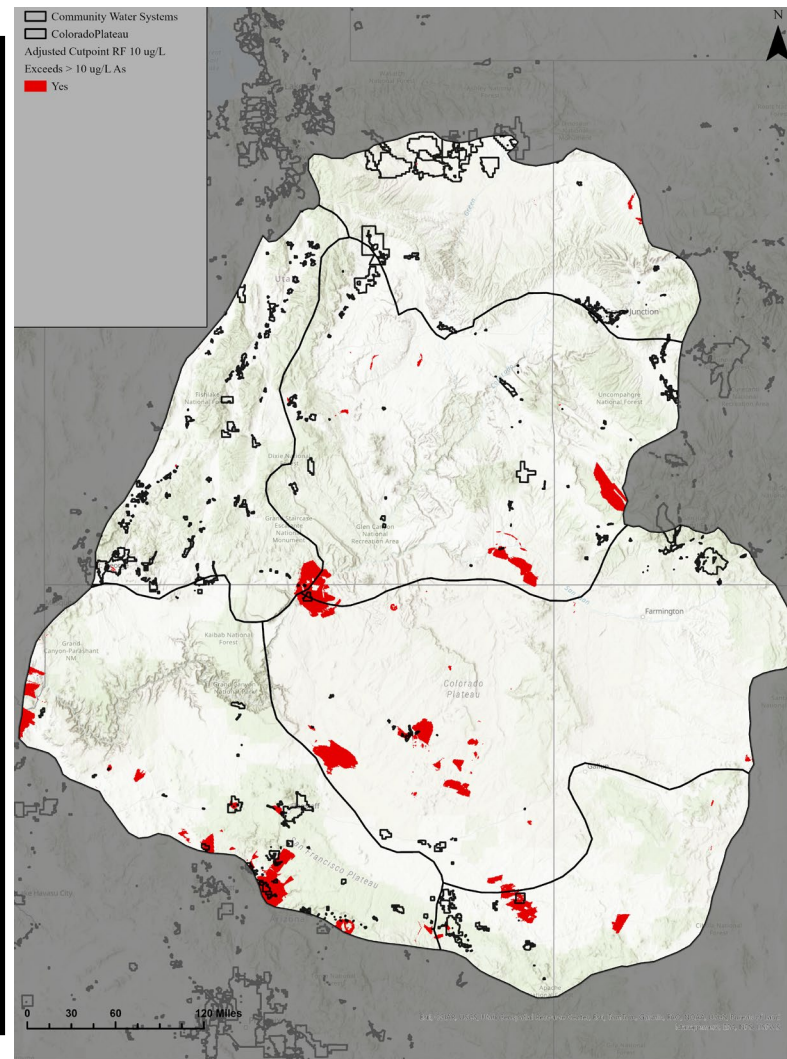
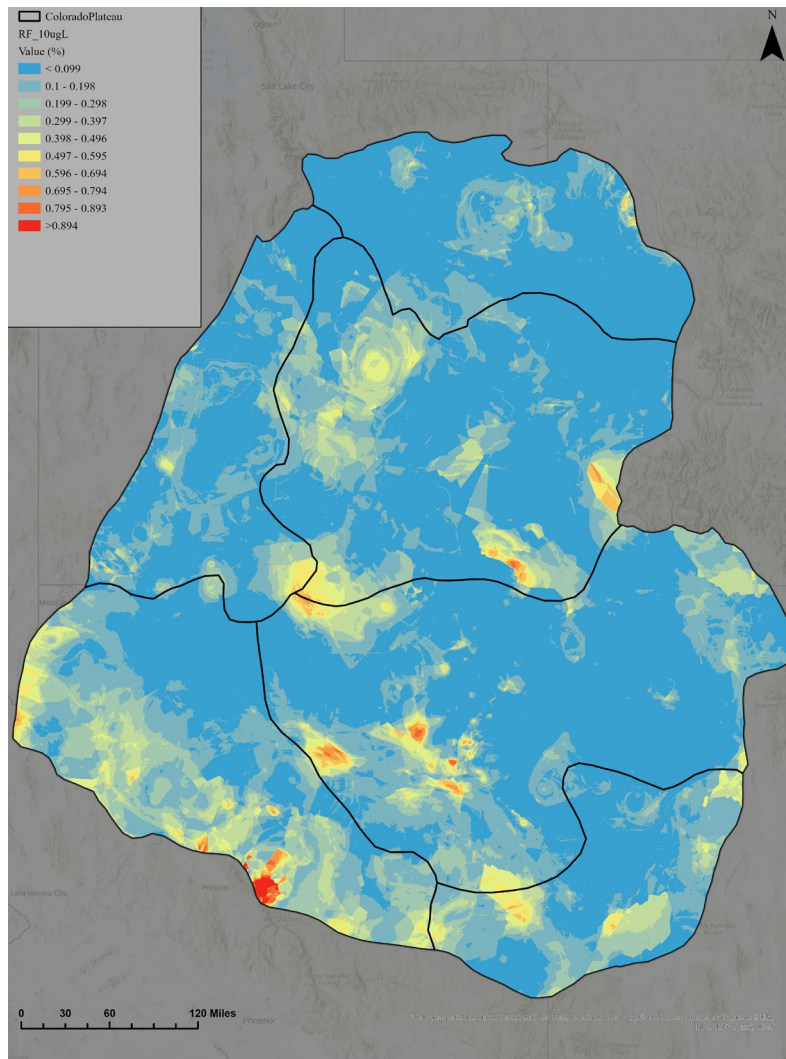
	N	Median (Mean) (µg/L)
All Data	2,218	3.0 (11.7)
Canyon Lands	190	2.0 (6.6)
Datil	129	2.0 (7.0)
Grand Canyon	236	4.0 (13.2)
High Plateaus	141	3.4 (6.0)
Navajo	670	2.7 (6.5)
Uinta Basin	209	3.0 (12.5)
Proximal to Plateau*	643	3.9 (19.9)

Note:*denotes wells not within the boundaries of the Colorado Plateau but retained for analysis to avoid edge effects when conducting spatial modeling

Kruskal-Wallis [$X^2= 25.197$, $df = 5$, $p\text{-value} <0.001$)] and Dunn’s test suggest As is higher in the **Grand Canyon** compared to **Canyon Lands**, **Datil** and **Navajo** subunits ($p<0.05$)



Results - Probability of exceeding 10 µg/L As (Random Forest Model)



Random Forest Model Performance Metrics		
Metric	5 µg/L As	10 µg/L As
Accuracy (%)	75.7	85.6
Sensitivity (%)	57.5	42.4
Specificity (%)	85.6	95.6
Kappa	0.447	0.445

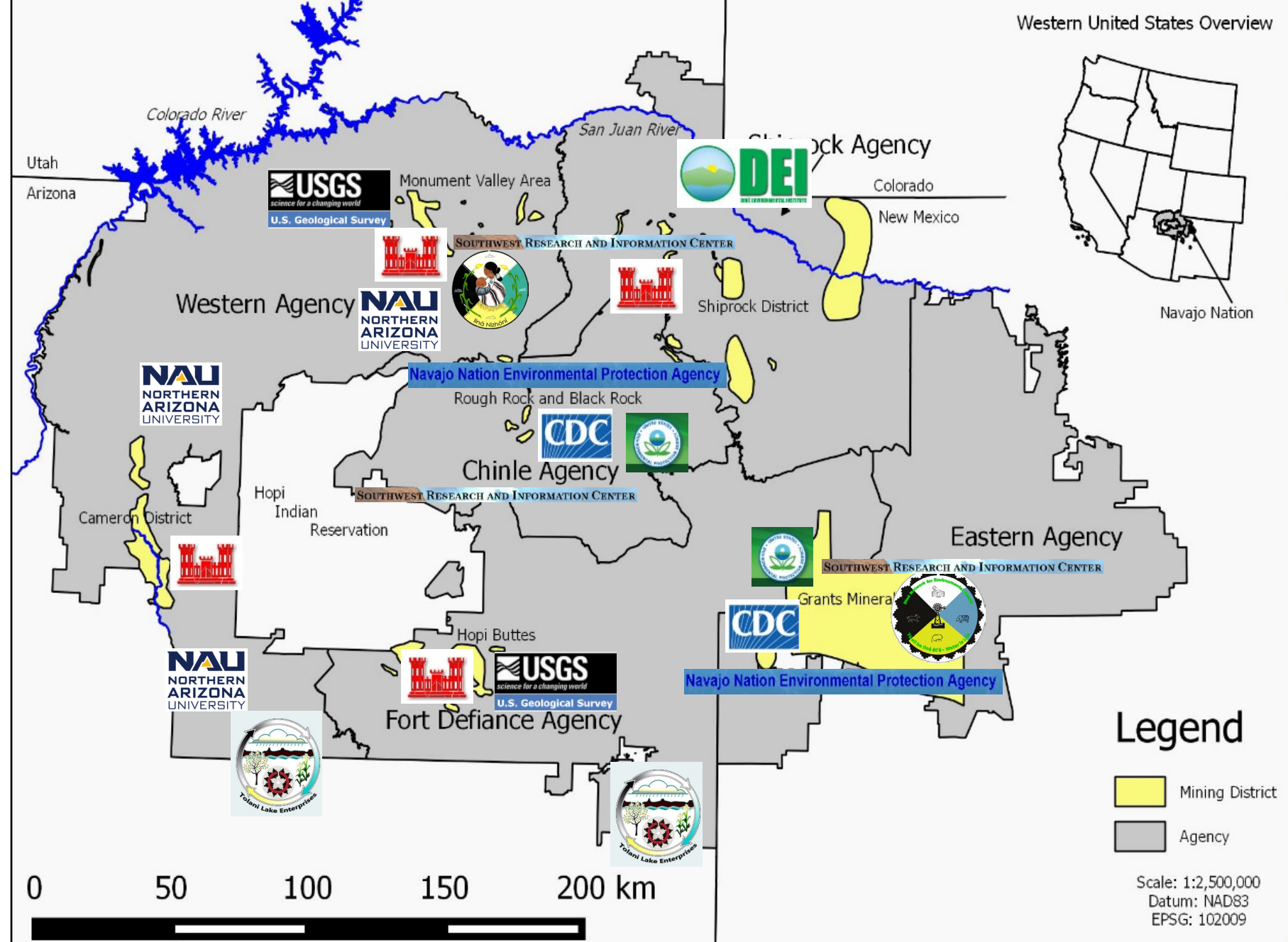
Data harmonization

Datasets had distinct geographic areas of focus

- Compiled and harmonized data provide a broader geographic scope
- Created a data cleaning and harmonization pipeline using R and OpenRefine

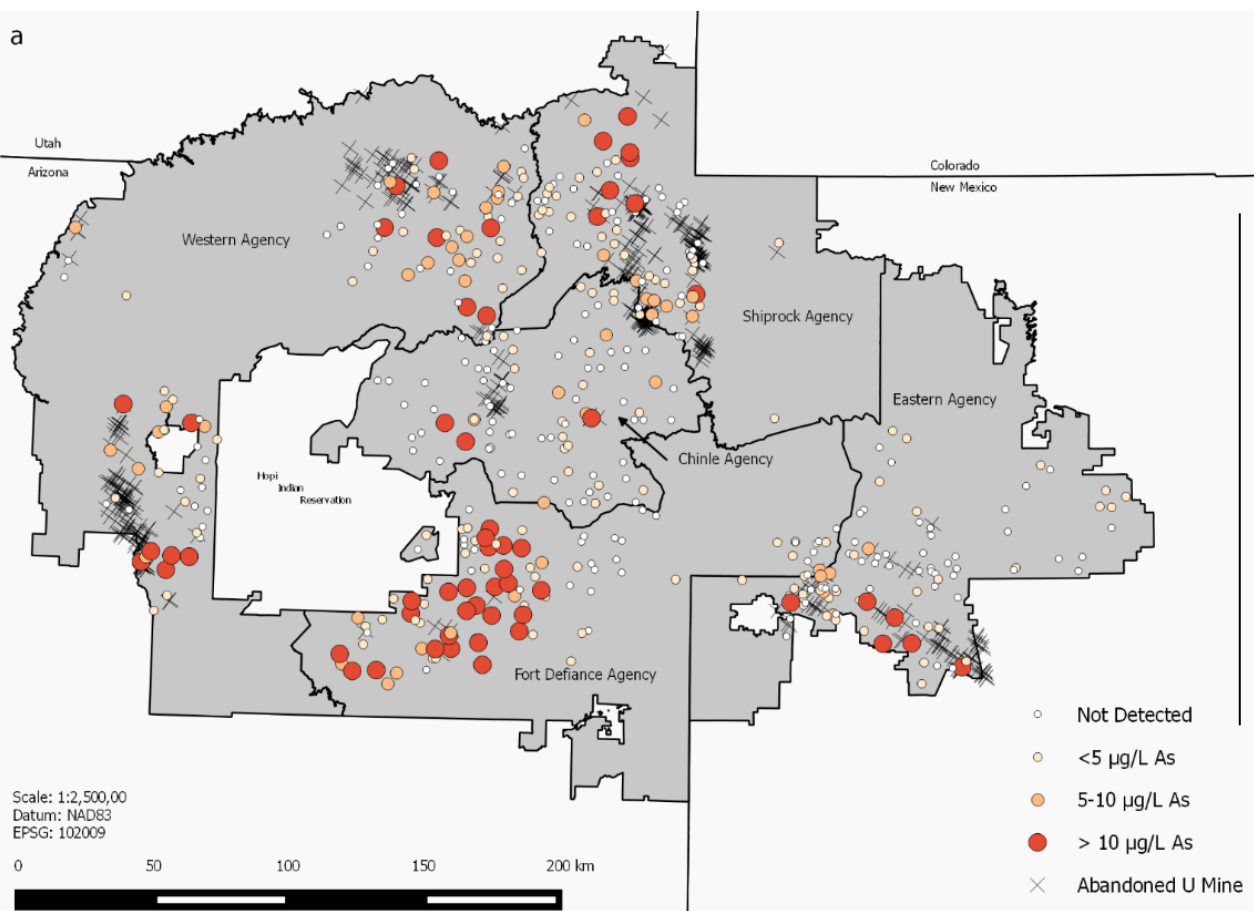
Result

- 70,000 chemical observations for 2,000+ UWSs, including quality control data for most in a geospatial relational database

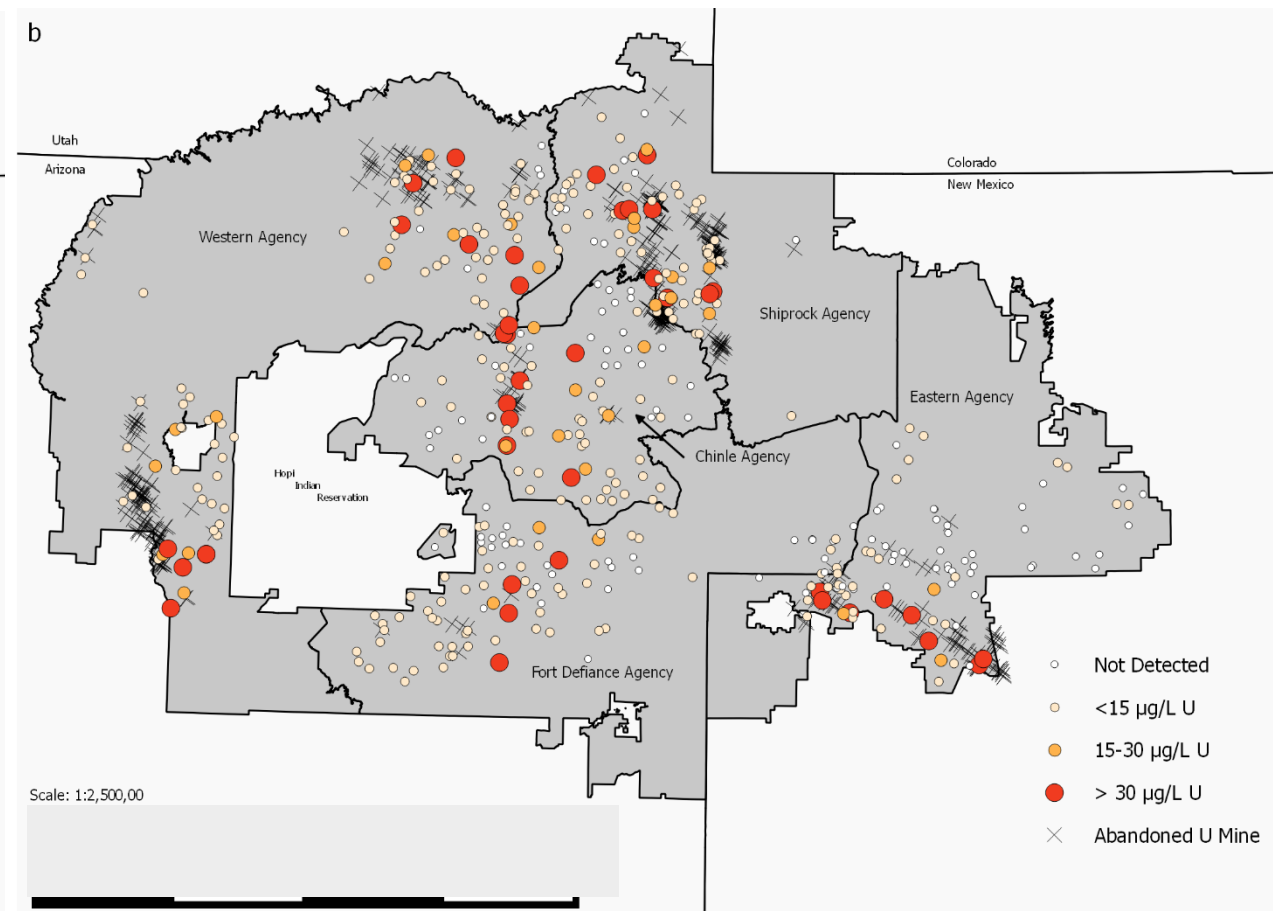


Spatial distribution of uranium and arsenic in unregulated water sources

Results – 15.1% of UWSs exceed As MCL



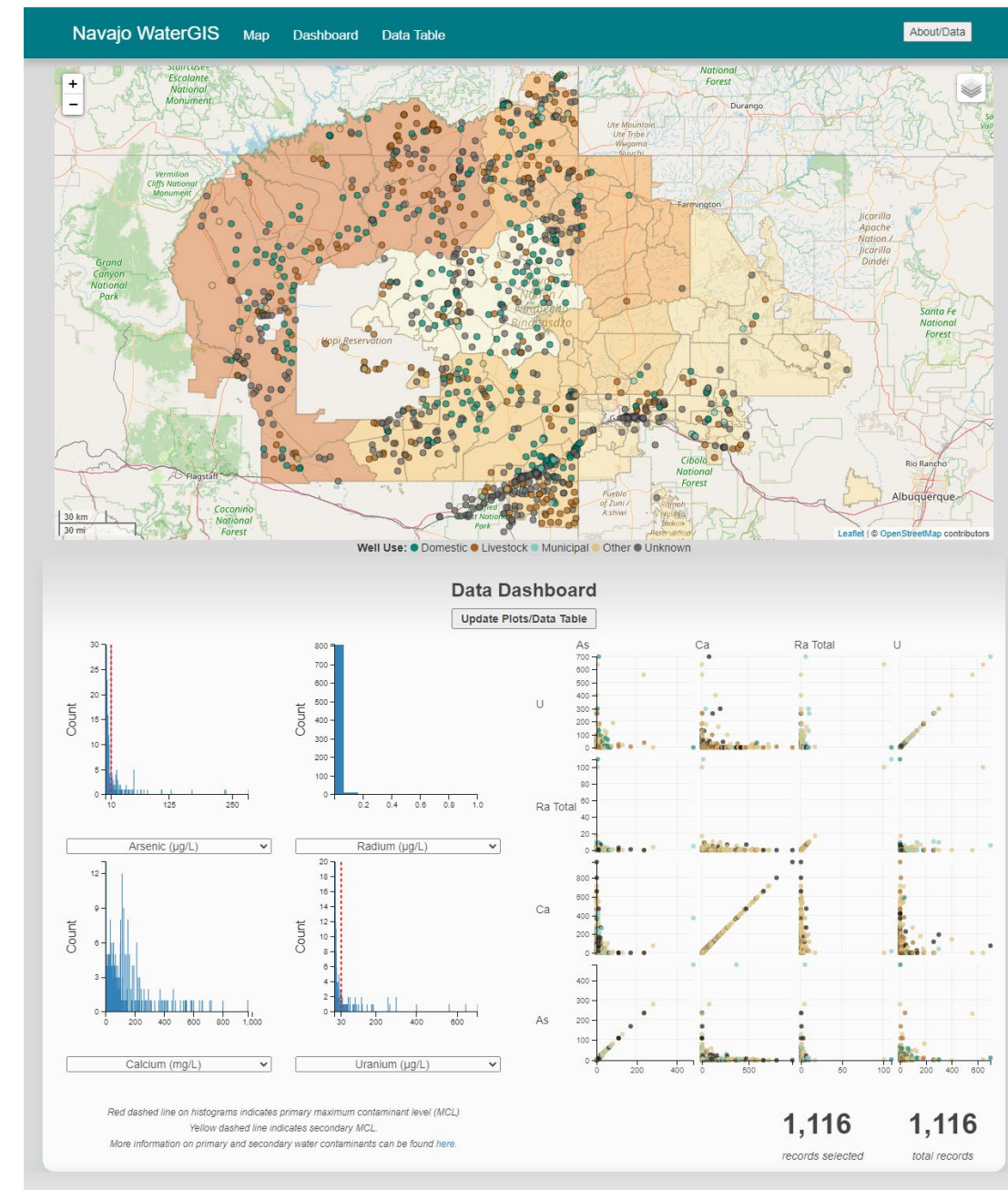
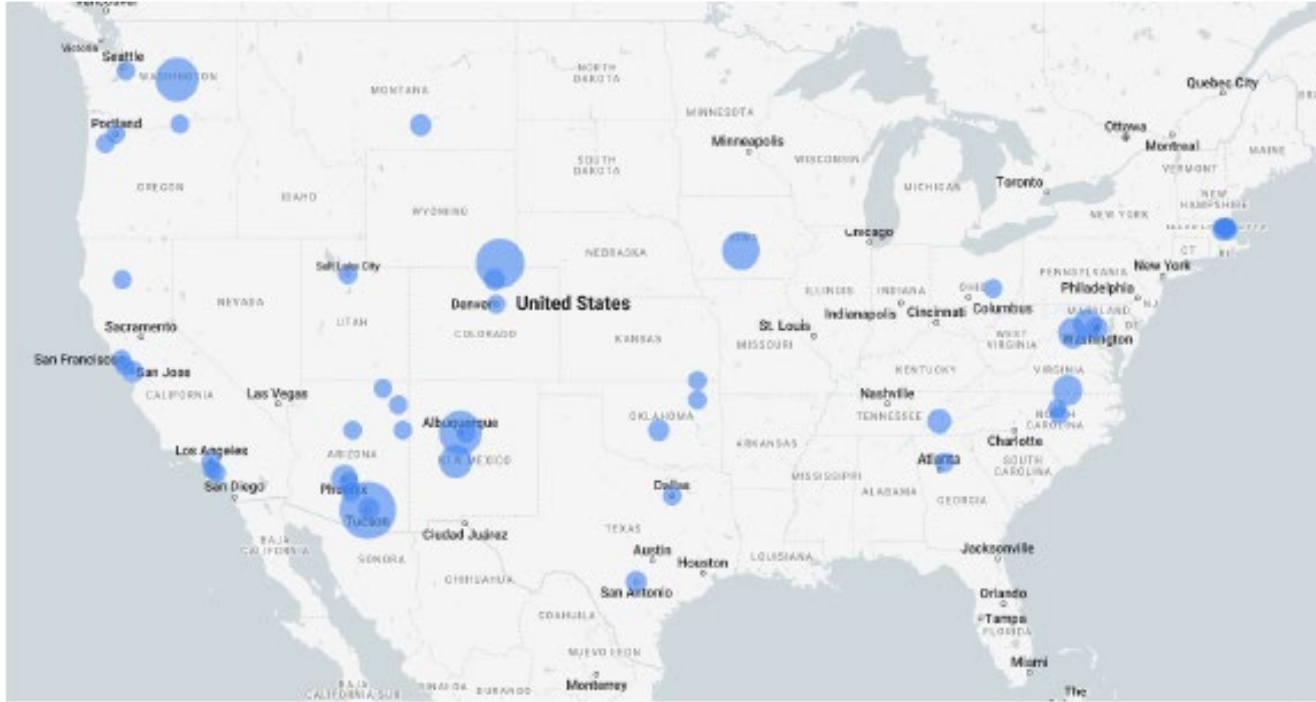
Results - 12.8% of UWSs exceed U MCL



Navajo Nation WaterGIS

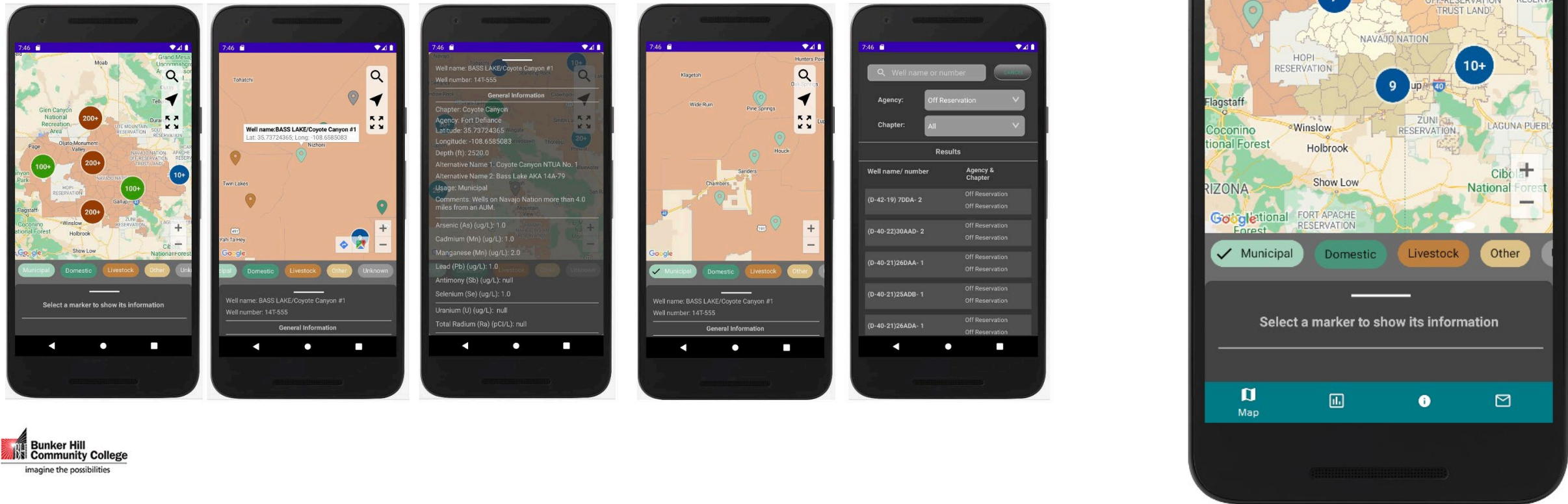
Key Features

- Created using JavaScript, CSS, and HTML
- WebGIS application with spatial representation of tested UWSs
- Summary statistics for all available analytes per UWS



WebGIS does not seem to reach the intended audience...so we are trying something else

Mobile application demo



FEATURE

Addressing Food-Energy-Water Insecurities
of the Navajo Nation through
Community Collaboration

Karletta Chief, Robert Arnold, Andrew Curley, Joseph Hoover,
Vasiliki Karanikola, Kelly Simmons-Potter, and Elizabeth Tel

az2107

January 2023



THE UNIVERSITY OF ARIZONA
Cooperative Extension



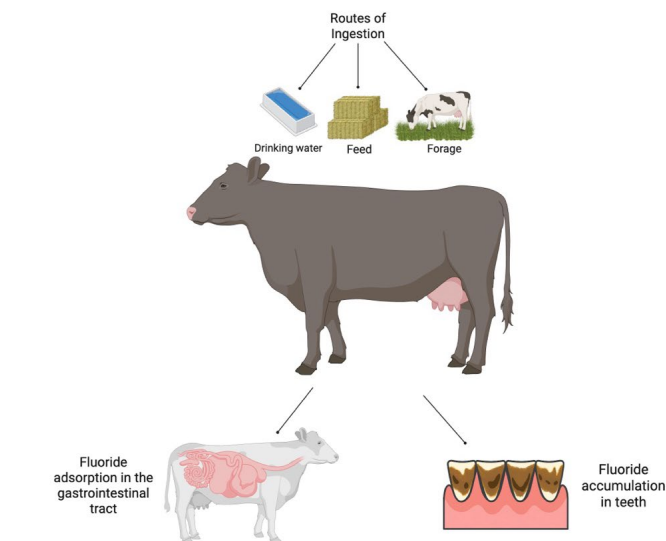
Groundwater Quality around Dilkon Chapter,
Navajo Nation

Lynn Carroll, Ailyn Brizo, Dana Clashin, Jani Ingram, Joe Hoover,
Karletta Chief, Emma Robbins, Katie Janss and Vasiliki Karanikola

FEATURE

It Takes a Team: Tackling Water Quality
Challenges and COVID-19 in the Navajo Nation

Joseph H. Hoover, Daniel Beene, and Karletta Chief



Groundwater Fluoride Exposure and Potential Effects on Arizona Livestock

Authors. Chrisa Whitmore¹, Lynn Carol², Anupama Sethuraman¹, Anna Rondon³, J
Yancy³, Jani Ingram⁴, Michael K Johnson^{5,6}, Karletta Chief^{1,6}, Vasiliki Karanikola^{2,6}, Joseph
Hoover^{1,6}]



Water tells a story: Tracing uranium contamination in a rural Arizona community



The Southwest US & Colorado Plateau face unique water challenges

Climate

- Projected rapid drying and dwindling water supply
- Limited availability of surface water, reliance upon groundwater



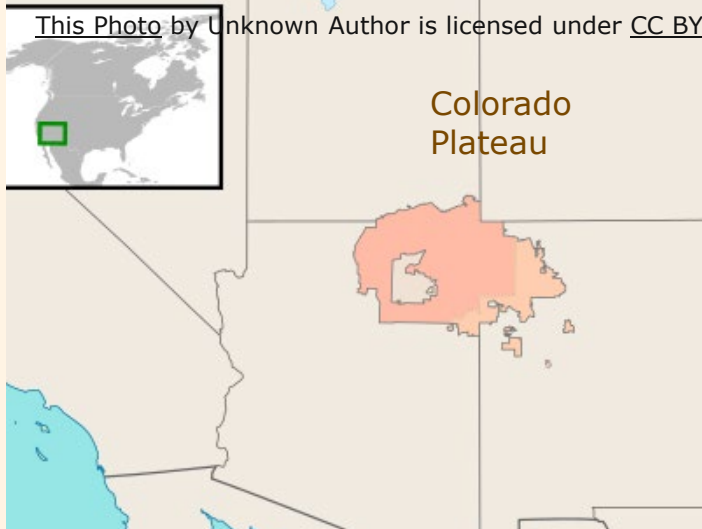
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Legacy mining

- Water contamination related to historic mining activities
- Many unregulated water sources



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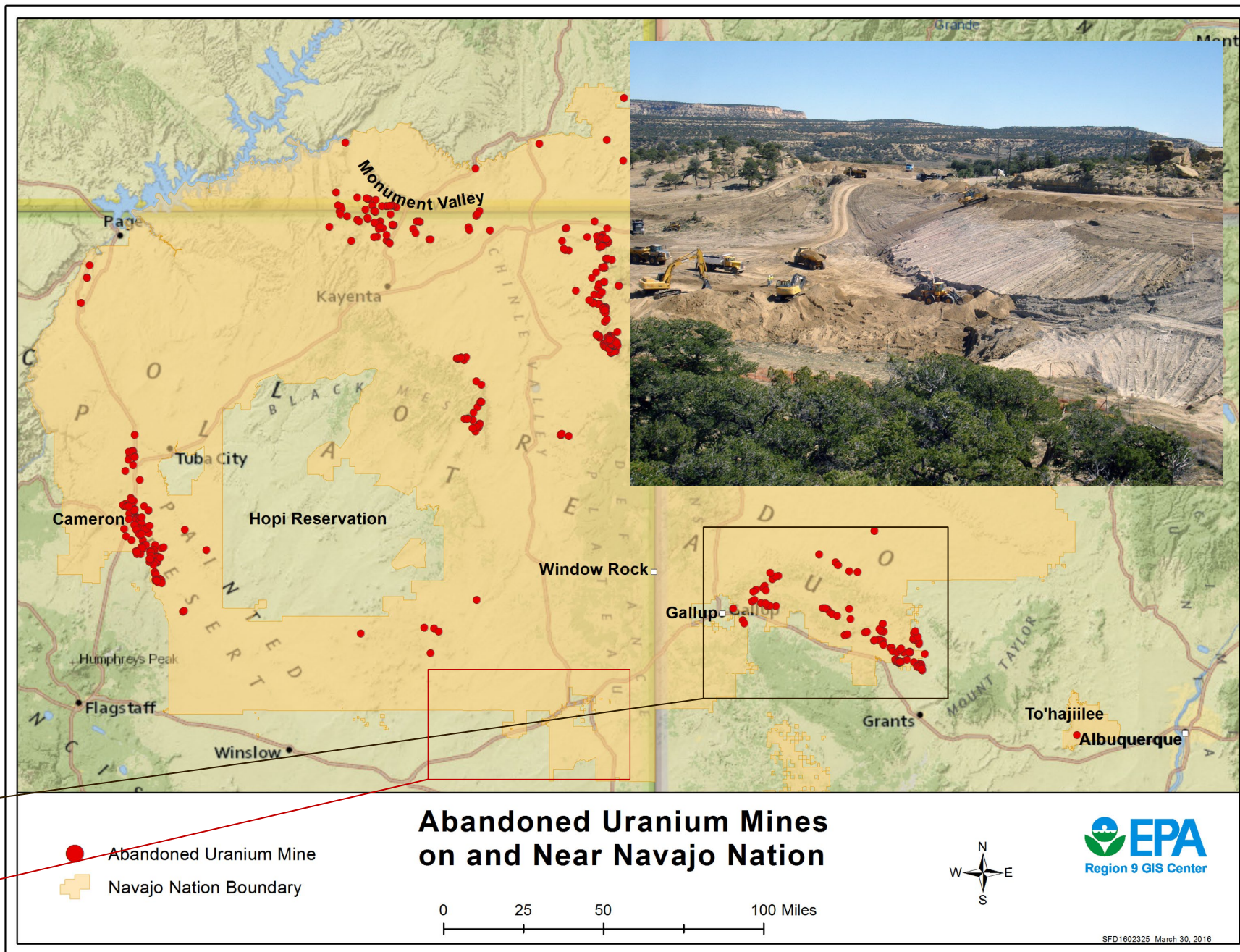
- 523 abandoned uranium mines (AUMs) exist on Navajo Nation¹
 - Many are unremediated
- Histories of uranium mining range from 1944-1986²

Grants Mineral Belt

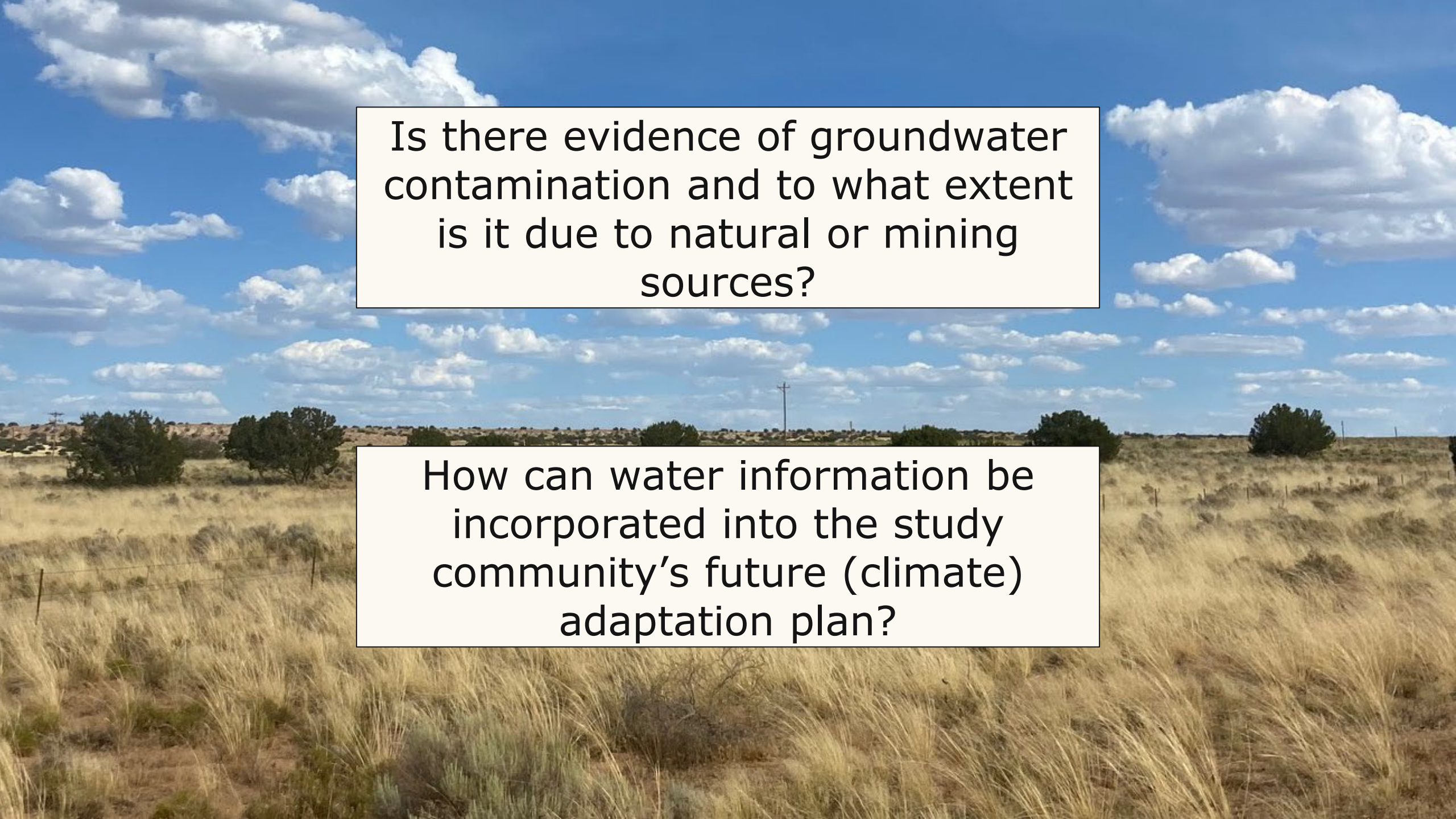
Navajo-Hopi Land Settlement Act Relocation Area

¹Lewis, Hoover, and Mackenzie 2017

²US EPA 2023







Is there evidence of groundwater contamination and to what extent is it due to natural or mining sources?

How can water information be incorporated into the study community's future (climate) adaptation plan?



Methods





What are we looking for?

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Major Ions

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Trace Metals

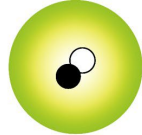
(1) What is in the water?

(2) Where does the water come from?

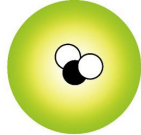
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^1_1H

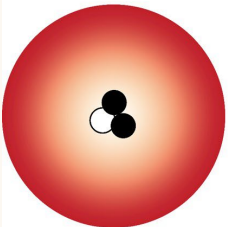


^2_1H = Deuterium

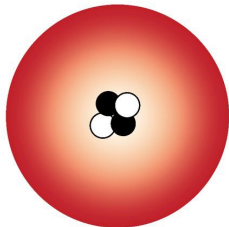


^3_1H = Tritium

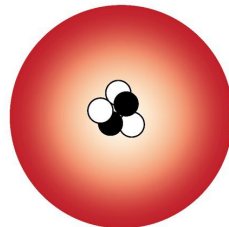
Stable Isotopes



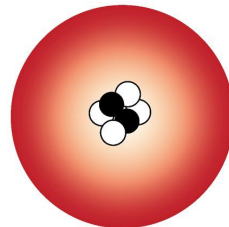
^3_2He



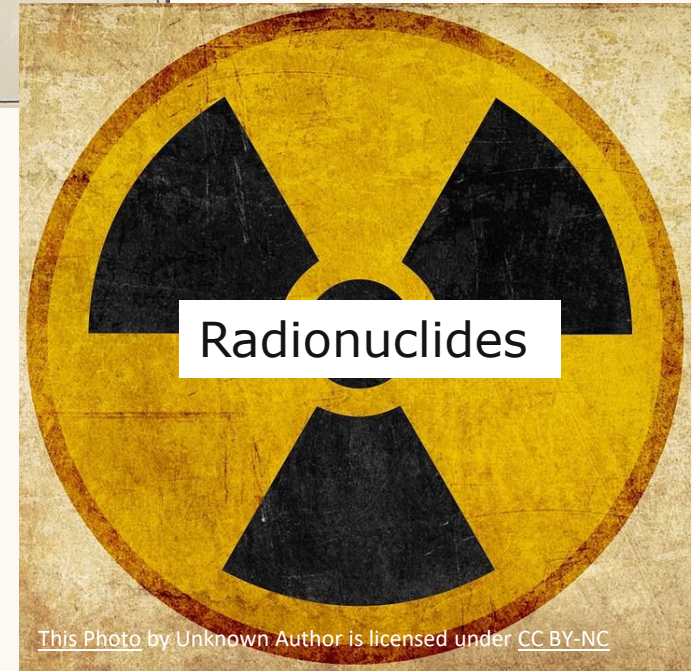
^4_2He



^5_2He



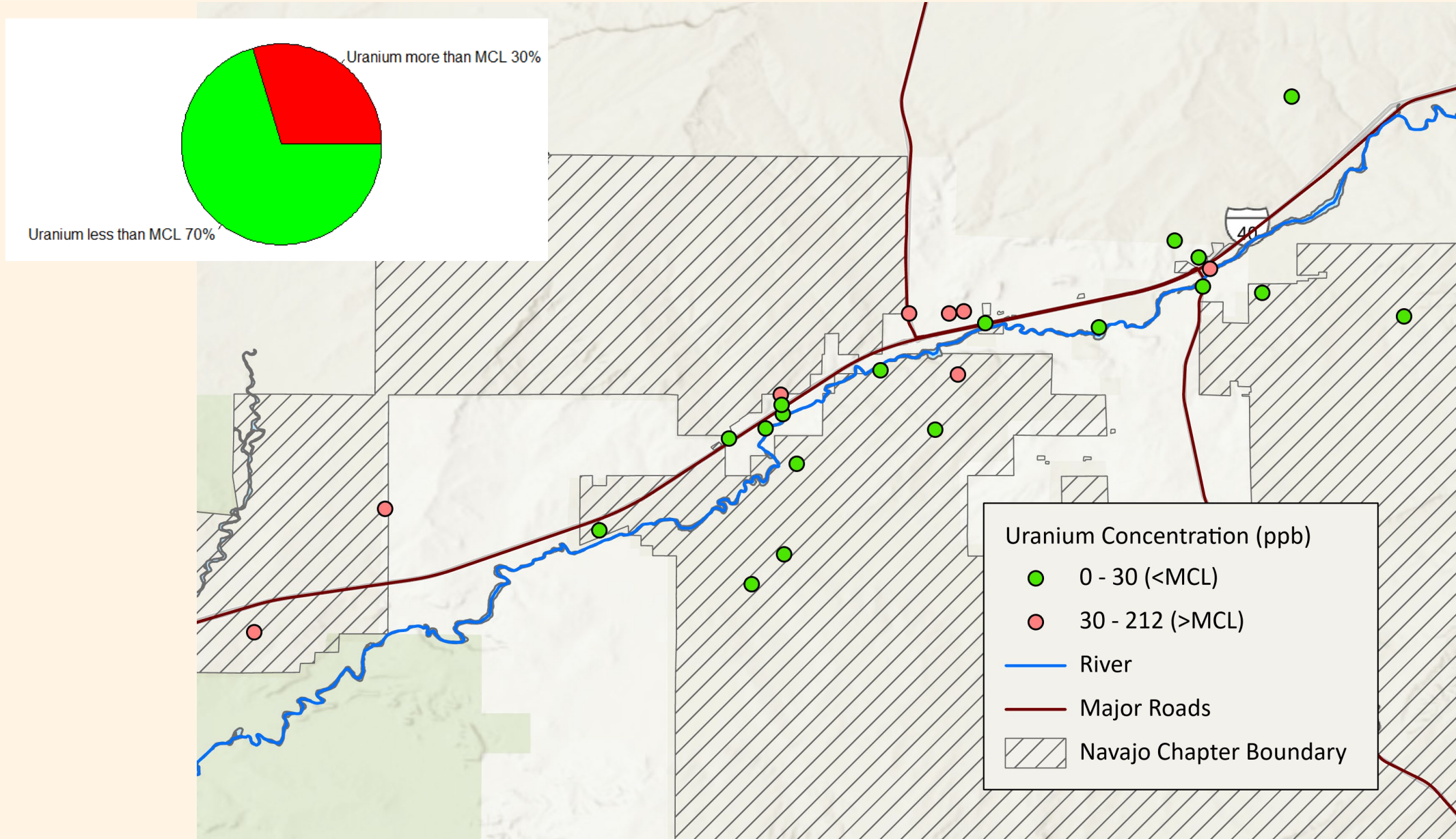
^6_2He



Radionuclides

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Several wells show evidence of uranium contamination



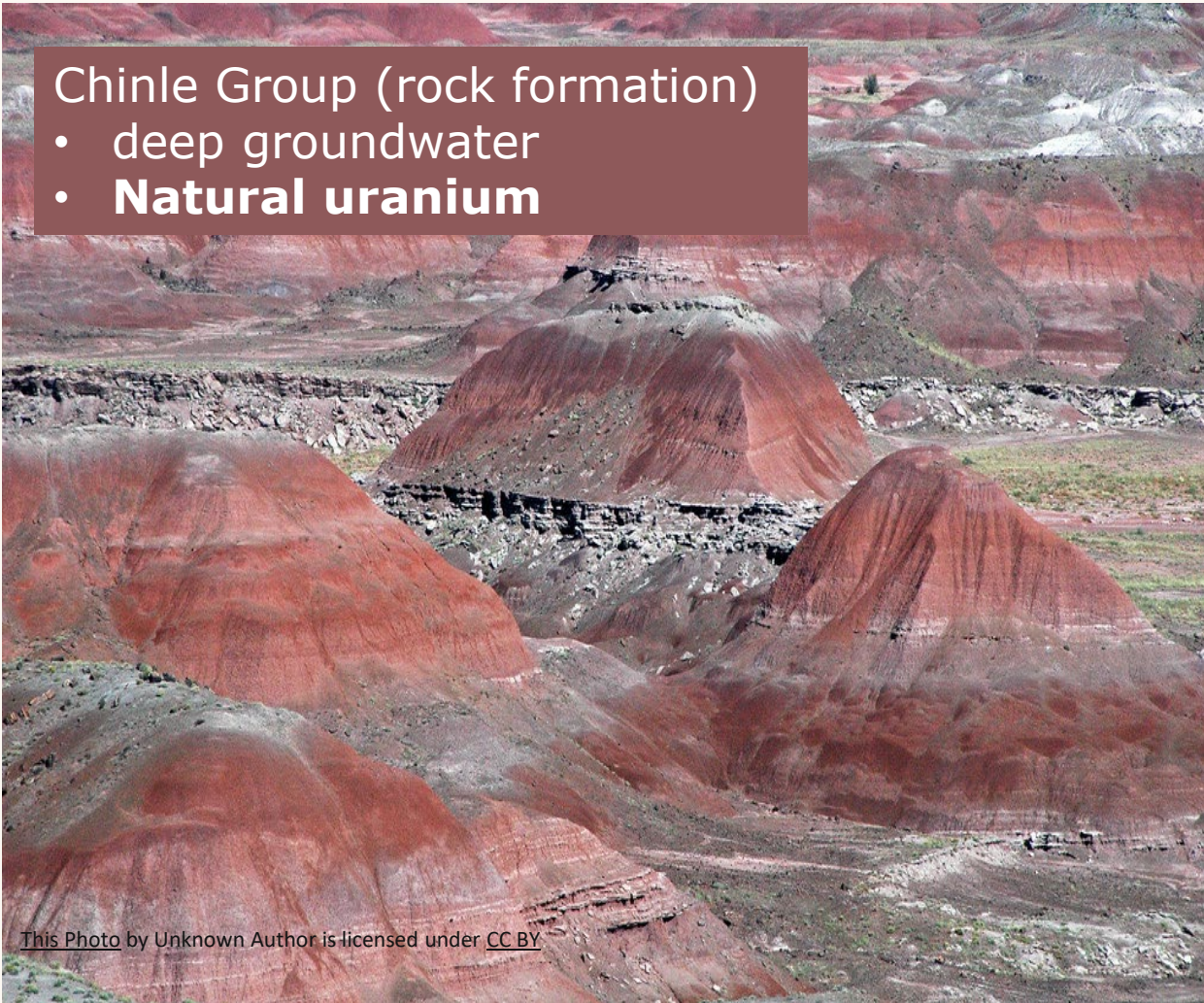
8 of 27 wells show Uranium over the EPA's Maximum Contaminant Level (MCL) of 30 ppb



Uranium in the community may be coming from multiple sources

Chinle Group (rock formation)

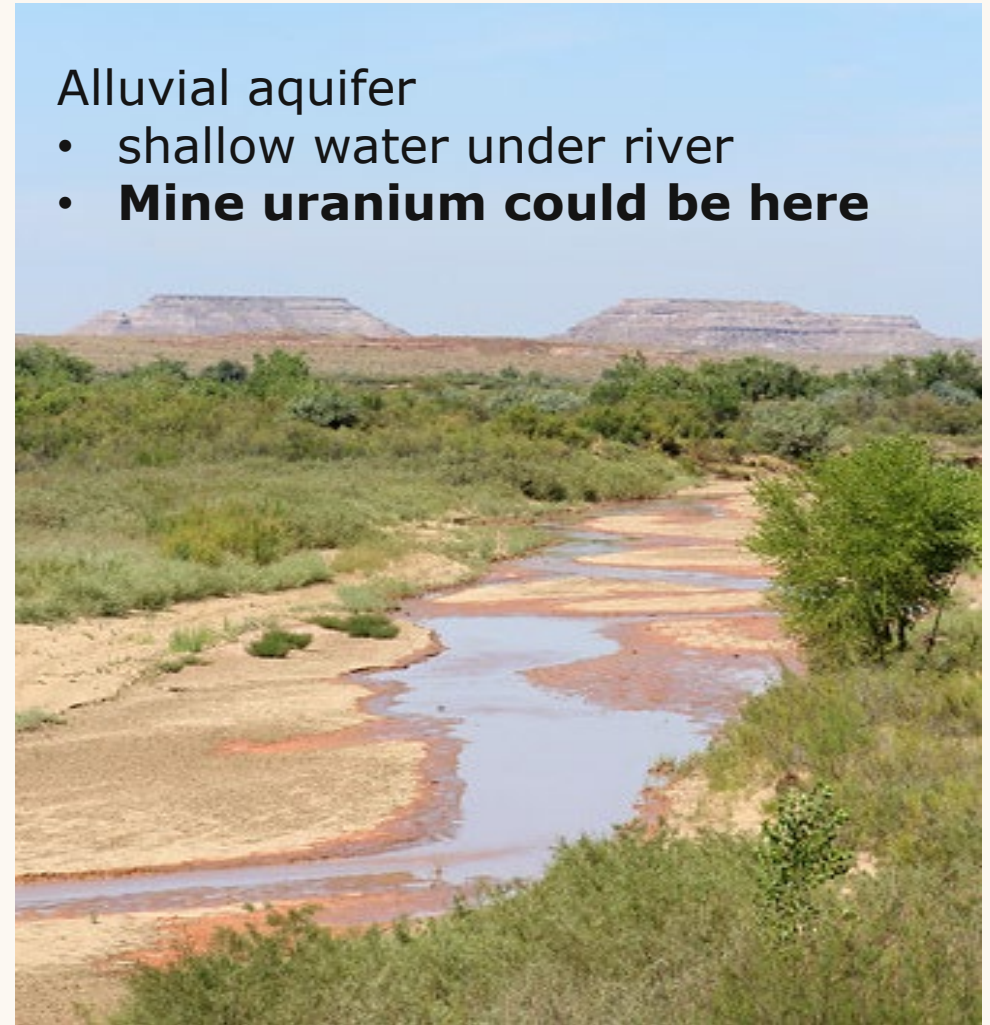
- deep groundwater
- **Natural uranium**



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Alluvial aquifer

- shallow water under river
- **Mine uranium could be here**

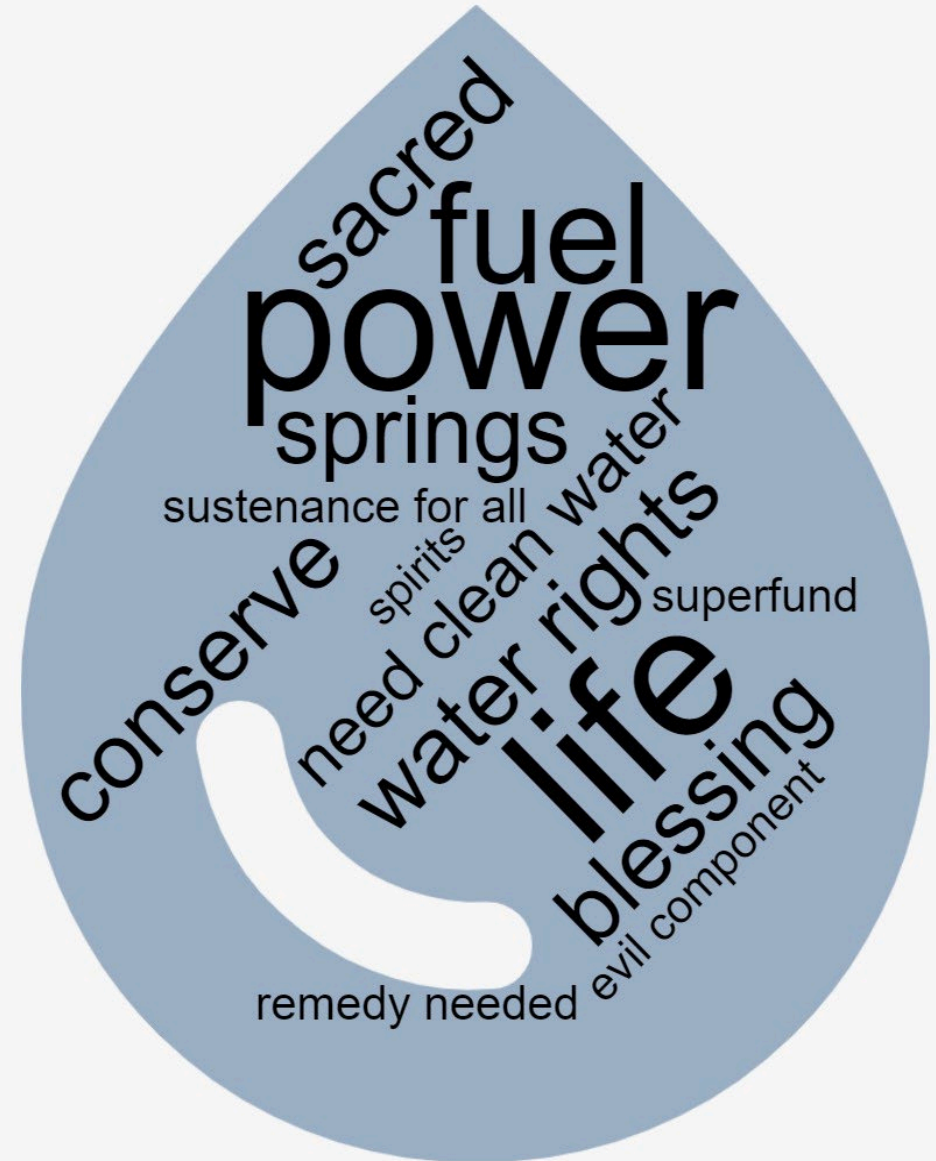


For the study community, water is a critical priority

My research is **community-based**



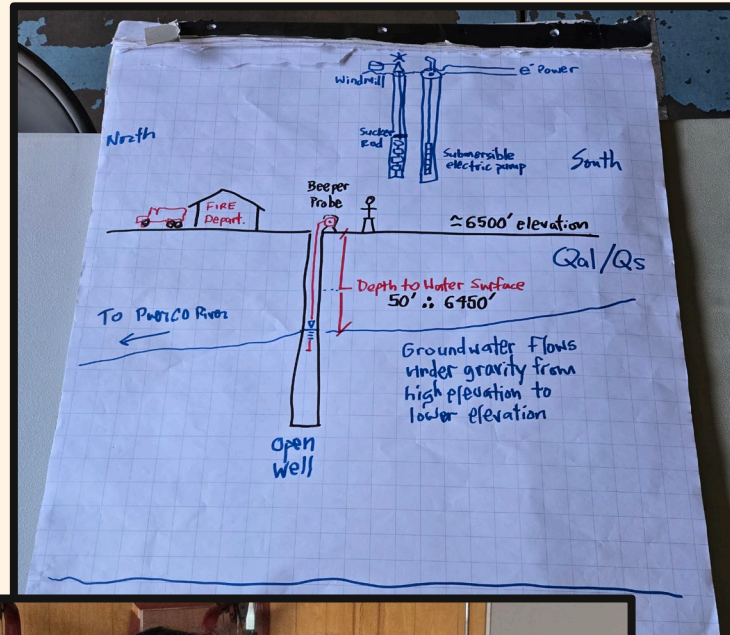
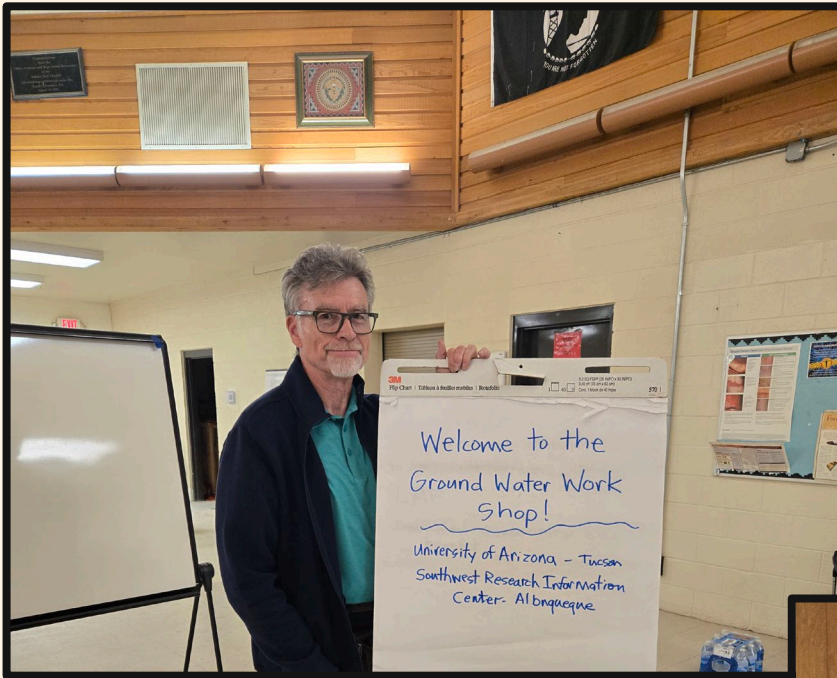
- Hold workshops to hear community concerns
- Adapt future activities to stakeholder priorities
- Turn data → recommendations to improve water “resilience”



What does water mean to you?

Water Education Workshop, October 2025

- Held a water education workshop in community
- Day 1: Discussion Tables Topics
 - 1) Water and Rocks in the Area
 - 2) Water Quality
 - 3) Uranium and Health
- Day 2: Water Sampling Demo



Co-producing Water Recommendations

- Will facilitate 4 dialogue-centered workshops to hear community concerns
- Focused on current and historical water issues, Indigenous ways of knowing, and future water priorities

Current Plan [IRB Pending]:

Workshop 1: Gathering Information — What water means to you and your community.

Workshop 2: Identifying Strengths and Weaknesses — Water issues in your community.

Workshop 3: Identifying Root Causes — Climate change and environmental concerns in your community.

Workshop 4: Establishing a Vision — Water planning.



University of Arizona Colleagues

- Jen McIntosh, Hydrology
- Heidi Brown, College of Public Health
- Marc Verhoughstraete, College of Public Health
- Pete Reiners, Geosciences
- Tong Guo, Hydrology

Indigenous Resilience Center

- Karletta Chief
- Cherie DeVore
- Michael Johnson

KORES Lab

- Vasiliki Karanikola, Chemical Engineering, University of Arizona
- Lynn Carroll, Environmental Engineering, University of Arizona

Environmental Isotope Lab

- Todd Lange
- Nitzan Yanay, Xiaoyu Zhang

Thank you!

Research Team Members

Southwest Research and Information Center

- Chris Shuey
- Earle Dixon,
- Kirena Tsosie

Utah Sr Isotope Facility

- Diego Fernandez

State Lab of New Mexico

- Nidal Jadalla

Center for Native Environmental Health Equity

- Debra MacKenzie
- Yan Lin
- Daniel Beene
- Teddy Woldeyohannes

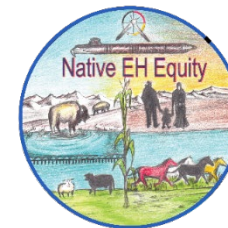
Others

- Kimberly Beisner

Current Group Members

- Andee Lister (Post doc)
- Miles Fule (Data scientist)
- Sheneil Agyemang (PhD student)
- Anu Sethuraman (PhD student)
- Chrisa Whitmore (PhD student)
- Brooke Damon (MA student)
- Elayna Filippone (Undergraduate RA)
- Noah Henio (Undergraduate RA)
- Dawnae Yazzie (Undergraduate RA)
- Aaron Nuanez (MS, graduate 2025)

Funding: NIH P50ES026102, P50 MD015706, 20ES036112, USEPA (#83615701), USGS Cooperative Agreement G24AC00083, National Science Foundation (grant #2120733), Haury Native Pathways Award 23-24, Carson Scholarship 24-25, Waverly Street Foundation





WRP TEC Next Steps

WRP Tribal Engagement Committee Co-Chairs



Will Micklin

- CEO, Ewiiapaayp Band of Kumeyaay Indians

**LeRoy N.
Shingoitewa**

- Hopi Tribal Council Representative

**Floyd W
Velasquez Sr.**

- Emergency Services Administrator, Morongo Band of Mission Indians



Roll up of Action Items



- **GOOD NEWS – new WRP NR Co-Chair:**
 - Darren Talayumptewa, Southwest Region Director/Native American Fish and Wildlife Society and Native American Liaison/Wildlife Biologist/ American Eagle Research Institute (AERIE)
- **Please sign up for a WRP account – wrpinfo.org**
 - Invite/Encourage other Tribal members/liaisons to be part of TEC
- **Please provide input on Tribal Leadership Excel document**
- **Seeking additional TEC Co-Chair**
- **Interest in being part of a WRP Deep-Dive:**
 - Water Security/resilience
 - Wildland Fire (response/ prevention)
 - Aviation/ Airspace Needs
- **Please indicate if you:**
 - Are interested in being part of the Outreach Subcommittee
 - Have recommendations on future agenda topics
 - Have additional resources like a study/funding for the good of the team



WRP TEC Calls



Dec 5	▪ Utah Division of Indian Affairs by James Toledo, Deputy Director, Utah Division of Indian Affairs
Jan 30	▪ <i>(TBD): Update by the National Association of Tribal Historic Preservation Officers (NATHPO)</i> by Dr. Valerie J. Grussing, Executive Director, NATHPO ▪ Good Data, Stronger Tribes (Overcoming Native American data challenges in Southern California) by Robert Maxim, Fellow, Brookings Metro
Feb 27	▪ Picuris Pueblo Solar Project
March 27	
April 24	

Discussion items/future items:

- Tribes' land management policies with federal agencies
- How tribes are dealing with removal of tribal historical information from federal buildings

Presentations TBD:

- Mervin Wright: Identifying traditional plants and uses/work in Nevada
- Traci L Morris, Ph.D. American Indian Policy Institute - Center for Tribal Digital Sovereignty update



Around The Phone



Thank you!

