



Gold King Mine Spill Diné Exposure Project

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U. of Arizona (UA),
Northern Arizona U.
(NAU), Navajo Nation,
Diné College, Tó Bee
Nihi Dził, & Fort Lewis
College

TÓŁÍTSO, THE WATER IS YELLOW:

*Investigating short term exposure and risk perception of Navajo Communities to the Gold King Mine Spill
– Upper Fruitland; NM, Shiprock, NM; and Aneth, UT –*

Aim 1: Determine exposure of Diné residents in these three communities to the Spill.

August 2016: Navajo Community Health Representatives sampled drinking water, yard soil, and household dust in about 60 Diné homes to measure for lead and arsenic. They did a finger prick to measure lead in residents' blood using a 3-minute test machine. They collected a urine sample to measure for arsenic. They also asked people what they eat, how they use the river, and how the Spill impacted them.

To Date: In December 2017, we reported results back to the Shiprock, Upper Fruitland, and Aneth Chapters.

Aim 2: Measure lead and arsenic in river water, river sediment, agricultural soil, irrigation water, and irrigation sediment.

November 2015 – June 2016: We took almost 1,000 samples of water and sediment from the river and irrigation canals and soil from fields.

June 2016 – January 2018: We analyzed the samples for arsenic and lead. Water results were presented at Shiprock Ag days 2017

To Date: In March 2018, we reported results back during Shiprock Ag day.

Aim 3: Find out what people are concerned about when using the River after the Spill and find out the risk based on the samples and information collected for Aims 1 and 2 (left & middle columns).

May 13-22 & June 15-17: We held 12 group discussions or “focus groups:” 4 in Upper Fruitland; 6 in Shiprock; and 2 in Aneth. 123 total people took part in these focus groups. We asked people how they used the river before the Spill; how the Spill impacted them; and what they think about the river's future.

To Date: We are in the final stages of finalizing the summary of what people said. Information specifically related to the emergency response were presented at the Navajo Emergency Response Executive Session in September 2018.

Navajo Emergency Response Executive Session

The Gold King Mine Spill Diné Exposure Project hosted Navajo Emergency Response Executive Session - Lessons Learned from the Gold King Mine Spill on September 19 – 20 at the Native American Cultural Center of the Northern Arizona University (Flagstaff, AZ). More than thirty people attended the session, twenty of which were Navajo tribal leaders and tribal managers.

In this session, the GKMS-DEP group shared results on the impacts of the Gold King Mine Spill on Dine' Communities, with an emphasis on the social impacts. The session was aimed to help attendees to understand emergency response on the Navajo Nation, to learn of emergency response tools and other cases on emergency response to environmental disasters, and to synthesize lessons learned from GKMS-DEP results. Attendees actively participated in the discussion and provided many good recommendations on future emergency response practices, many of which the GKMS-DEP group will implement into community healing efforts in the future events.



Attendee shared insights on emergency response in the Navajo Nation

Shiprock Teach-in with NM Water Resources Research Institute

On June 22, 2018, the Gold King Mine Dine Exposure Project co-hosted a community teach-in with the New Mexico Water Resources Research Institute at the Navajo Shiprock Chapter House in Shiprock, NM. This event was part of the 3rd annual conference on Environmental Conditions of the Animas and San Juan Watersheds: Past, Present and Future. Sixteen researchers from the conference each gave 3-minute flash talks on their results related to research projects on the San Juan River and the Gold King Mine Spill. Contents of each flash talk were translated and explained in Navajo immediately after each flash talk, then the floor was open to questions for one and a half hours. Topic of particular interest among community members are water and soil quality before and after the Spill. Approximately 30 people from the Navajo community attended the teach-in, and the poll at the end show the results were well received.



Researcher gave 3-minute flash talk on the results related to San Juan River and the Gold King Mine Spill at Shiprock Chapter House

GKMS-DEP Key Results Videos

As one of the many efforts to make the research results of GKMS-DEP available to Dine people, we made videos to introduce our project findings, narrated in Navajo with English subtitles. Four out of six videos are now complete and can be found on our YouTube channel “Navajo Gold King Mine Spill Exposure Project” and facebook page “Gold King Mine Spill: Dine Exposure Project”.

- ❖ **Video 1 in Navajo: Introduction of Project (complete, ~11 min)**
 “Tó’Éítso, the water is yellow: Investigating short term exposure and risk perception of Navajo communities to the Gold King Mine toxic spill”
- ❖ **Video 2 in Navajo: Water Quality Results (complete, ~6 min)**
 “Arsenic and Lead in Water in 3 Navajo communities 1 year after the Gold King Mine Spill”
- ❖ **Video 3 in Navajo: Sediment Quality Results (complete, ~13 min)**
 “Arsenic and Lead in Soil and Sediment in 3 Navajo communities 1 year after the Gold King Mine Spill”
- ❖ **Video 4 in Navajo: Household Results (complete, ~10 min)**
 “Gold King Mine Spill Human Exposure to Arsenic and Lead Household results”
- ❖ **Video 5 in Navajo: Focus Group Results (in progress)**
- ❖ **Video 6 in Navajo: Emergency Response and Community Healing (in progress)**



1-Project Introduction.mp4



2-Water Results.mp4



3-Soil Results.mp4



4-Household Results.mp4



Farmer Survey at Northern Navajo Fair

On Oct 5th, UA team administered farmers’ survey at the Northern Navajo Fair with Navajo Nation Community Health Representatives (CHRs). The survey was designed to better understand how farmers use the San Juan River before and after the Gold King Mine Spill. We completed 54 surveys in total. Results of the survey are being digitalized and will be analyzed and shared with Dine people.

WATER REPORTER

Are you curious about the water quality of the San Juan River on the Navajo nation? Download the Water Reporter App on your smartphone for updates:

Phone App Instruction

Step 1. Visit the App Store on Your Phone

Step 2. Search for 'The Water Reporter' and download the app

Step 3. Create an account for yourself

Step 4. Add yourself to the Gold King Mine Spill Diné Exposure Project group

Step 5. Share any photos or notes you take of the San Juan River - we want to see the river from as many different viewpoints as possible!

Step 6: Look out for San Juan river quality updates

Web Instruction

Step 1. Visit www.waterreported.org

Step 2. Click on Sign Up and create an account for yourself

Step 3. Add yourself to the Gold King Mine Spill Diné Exposure Project group

Step 5. Share any photos or notes you take of the San Juan River - we want to see the river from as many different viewpoints as possible!

Step 6: Look out for San Juan river quality updates



San Juan River flowing on March 22nd 2018 at 9:00 am near Kirtland, NM

San Juan River Monitoring

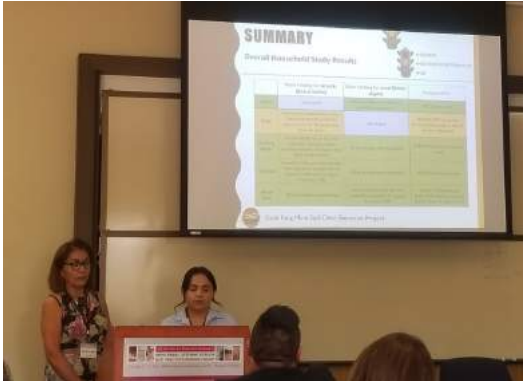


Dine College TCUP interns, Navajo Nation Community Health Representatives, and UA team

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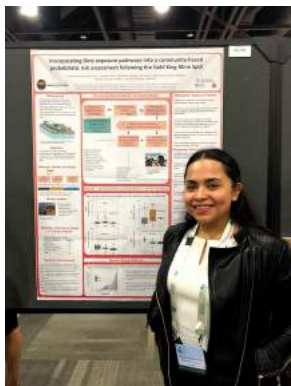
On June 12 – 14, UA team lead a water sampling training for Navajo Nation Community Health Representatives (CHRs) and Diné College TCUP interns to improve capacity for emergency response and results communication following a spill. CHRs and Diné college interns collected water samples side by side along 5 sites on the San Juan River and 10 irrigation canals from 10 farms on the Navajo Nation. The samples were then sent to the Ingram lab at Northern Arizona University for analysis.

NIEHS Tribal Listening Session



The NIEHS tribal listening session was held in Phoenix on October 16 – 17. Yoshi (UA) and Mae-Gilene Begay (NDOH CHR Director) connected with tribal members from Tohono O’odhom, Pascua Yaqui, Hopi, Navajo and Apache, Cocopah in this meeting. The listening session served to connect people who involved in disaster preparedness (e.g. tribal leaders and emergency managers), and to encourage discussion on emergency response in indigenous communities.

International Society of Exposure Science



Yoshi (UA) presented a poster at the International Society of Exposure Science in Ottawa, Canada on August 26th, 2018. The poster details the community based risk-assessment model being used to assess the exposures and risk as a result of the GKMS.

Tribal Environmental Health Summit



Carmenlita (NAU) presented the focus groups results at the Tribal Environmental Health Summit in Corvallis, Oregon on June, 2018.

Navajo Nation CHRs at 2018 AzCHOW conference

Two Community Health Representatives from the Navajo Nation that have worked with the research team on the GKMS project, Rose Todacheenie and Priscilla Yelloman attended the 2018 AzCHOW conference on June 21-22. They attended breakout sessions, including oral health, compassion fatigue, elder falls at the conference and got connected with other CHRs (e.g. CHWs in Southern Arizona deliver messages in Spanish and do home visits as well). They thought that each district should send a CHR to this conference to learn and bring back to her district.



We gratefully acknowledge our many research partners, volunteer students, advisory board members, and funding sources. This research effort is enhanced immensely by their enthusiastic support.



American Public Health Association (APHA) selected Mae-Gilene Begay to be featured on the Who Is Public Health page. Mae-Gilene is the past immediate chair of APHA Community Health Workers section.

Karletta Chief received the 2018 National TriO Achievement Award in October 2018 in New York City.

WHAT'S NEXT?

- “Farming is life” corn results
- Spring 2019 Community Healing
- Spring 2019 Shiprock Ag Days
- Spring 2019 KTNN Radio Forum
- Summer 2019 Teach-in with NM WRII

Fact Sheet

Chief, K., J.F. Artiola, P. Beamer, S. Wilkinson, R.M Maier, C. Rock, and C. Sanchez. 2015. Understanding the Gold King Mine Spill. Fact Sheet. University of Arizona, Tucson, AZ. (http://www.superfund.pharmacy.arizona.edu/sites/default/files/u43/gold_king_mine_spill.pdf)

News Article

Beamer, P., K. Chief, N. Borrero, and B. Rivera. 2016. Water Is Our Life: How a Mining Disaster Affected the Navajo Nation. Truth Out, April 2016, <http://www.truth-out.org/news/item/36049-water-is-our-life-how-a-mining-disaster-affected-the-navajo-nation>.



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