

How are Geogenic Contaminants Affecting Ground Water on the Colorado Plateau?

C. Bebo¹, A. RoyChowdhury¹, D. Tibbits², S. Kinney^{2,3}, B. Slibeck³, C. Chang³, P. E. Olsen³

¹Navajo Technical University, ²Rutgers University, ³Lamont-Doherty Earth Observatory of Columbia University

The Navajo Nation is located on the Colorado Plateau and expands into Arizona, Utah, and New Mexico. Nearly 1/3 of the Navajo residents do not have access to electricity or running water and they rely on unregulated water wells. The majority of these water wells have arsenic and uranium levels higher than the USEPA limits for human consumption. Much of this contamination is linked to abandoned uranium and coal mines. However, contributions from geogenic sources are also significant but poorly understood. Very little is known about the distribution of these geogenic contaminants inside the bedrock and it can be a major factor of uranium and arsenic being distributed into groundwater. In this research project we used X-Ray Fluorescence Spectroscopy (XRF) to map naturally occurring arsenic and uranium in the bedrock of the Colorado Plateau. We analyzed 3 different cores collected by the Colorado Plateau Coring Project (CPCP-1) in Petrified Forest National Park in 2013. Cores were analyzed using the Minalyzer CS, a robotic XRF system that measures every element from sodium to uranium. From these measurements, we were able to map the vertical and lateral distribution of layers in the rock with high potential for geogenic contamination. This project will help us understand different sources of uranium and arsenic contamination in the groundwater of the Navajo Nation and the greater Colorado Plateau area.