Objective: This study addresses the need to understand current subsurface geochemical characteristics in Riverton, Wyoming, home to a former uranium mining site. After a five year drought, Riverton experienced record-setting flooding. There is concern that a decreased water stage can have major impacts on the geochemical makeup of this ecosystem as 1) a decreased water volume may result in an increase of pollutant concentrations and 2) a decreased water stage can have a significant impact the redox cycling within the subsurface and affect major biogeochemical cycles.

Samples for this study were taken three time points over a year (August 2015, June 2016, August 2016). This summer 77 samples from August 2016, and 28 samples from June 2016 were geochemically characterized and compared. These samples encompass the terminus of a five year drought (2011-2016) and the second largest flood on record at Riverton, WY. Findings indicate that subsurface geochemistry variation during these time points may decrease with depth.

Methods: A total of 105 samples were processed. Each sample was freeze dried (48 hours), weighed pre-and post-drying to determine soil moisture content (%), homogenized, and analyzed for carbon and nitrogen content on the Elemental Analysis (EA) machine.

Conclusions:
- In June 2016 and August 2016 variation in moisture, nitrogen, and carbon contents decreased with depth.
- Total % C and % N contents were also highly correlated with each other.
- PCA results indicate sample depth and moisture content appear to contribute most to the observed variation in the dataset.