

Rocks on Acid: Soil pH Levels Associated with Bedrock Type in Eastern California
Gabrielle Moreau, Department of Earth, Marine and Environmental Sciences, University of North Carolina at Chapel Hill

Scientific literature has established that multiple factors affect soil pH including topography, parent material, and elevation. However, soil pH has largely been studied in relation to agriculture and the effect of weathered rock on soil pH. This study explored whether minerals present in four bedrock types from the White Mountains in eastern California affect soil pH. We identified four sites each with a different bedrock type (basalt, dolomite, granite, and sandstone), and sampled soil at depths of 5cm and 15cm at each site.

pH-meter data showed that dolomite had the most statistically significant effect on soil pH and made the soil more basic. The granitic soil samples were the most acidic, and the effects of sandstone and basalt on soil pH compared to these other bedrock types are statistically indeterminate. These findings can be explained by the minerals present in the bedrock types. Dolomite is $\text{CaMg}(\text{CO}_3)_2$, which acts as a base. Basalt, granite, and sandstone have varying concentrations of SiO_2 , which contributes to soil acidity. Another key finding was that samples taken at 15 cm showed less statistical variation across all bedrock types compared to samples taken at 5 cm. This result is likely caused by the presence of organic material, dust, and ash at the 5 cm layer, which contributes to variance in pH.

Advisor: Dr. Drew Coleman