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Impacts of Geology on Major Ions in Springs Located in Cuyamaca Rancho State Park

Last year a geochemical evaluation of groundwater springs in the upper portion of the Sweetwater watershed was completed by a SDSU student Steve Phillips (Phillips, 2014). Phillips collected water samples from various locations including: Deer Spring, Cold Spring, Azalea Spring, Japacha Spring, Dyar Spring, Granite Spring, and Green Valley Falls. Field measurements were taken to determine the pH, temperature, and alkalinity of the springs. These locations were chosen due to the variations in the underlying geology, which includes the Cuyamaca Gabbro, Harper Creek Gneiss, Pine Valley Monzogranite, and the East Mesa Quartz Diorite. In order to gain a better understanding of the watershed and variations between the different springs, further lab analysis were needed to determine the major ion composition of the water samples. This new data will distinguish the differences in bedrock composition based on the geologic location of the springs. The major ions that this study analyzed include: calcium, magnesium, sodium, potassium, chloride, and sulfate. To determine the ion concentrations in the spring water samples this study utilized a chloride probe, a Spectrophotometer, and flame atomic absorption spectroscopy.