Chloride and Nitrate Distributions in Unsaturated Alluvium, Joshua Tree, California

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Abstract

The current study will advance the evaluation of ground-water recharge within arid environments such as Joshua Tree National Park. The dry conditions of the Joshua Tree area contribute to the lack of ground water sub-basin recharge of the Morongo groundwater basin in the southern Mojave Desert. The (JBWD) Joshua Basin Water District and United States Geological Survey (USGS) are evaluating ground-water useage and sustainability with a groundwater flow model. The estimation of ground-water recharge for the model involves measurements of solutes within the unsaturated zone. My specific research is the extraction and analysis of chloride, nitrate, and other soluble anions to see the hydrologic implications of accumulation of the soluble salts in desert settings. The methods used were oven-drying, sieving sediment of different depths, hydrating them and shaking overnight, filtering the liquid to acquire the soluble anions. Calculation of the mass of chloride and nitrate in the unsaturated zone is used to estimate the long-term downward water flux of the arid area. In this study, I will be comparing USGS previous data with more recent data to check for precision and accuracy.