

ABSTRACT

STABLE ISOTOPIC ANALYSIS (δD - $\delta^{18}O$) OF THE REGIONAL HYDROLOGY OF THE SAN JOAQUIN RIVER, FROM MILLERTON LAKE TO MENDOTA POOL, CALIFORNIA

Samples of rain, surface, and groundwater were collected along the San Joaquin River, during the 2006-2007 season for stable isotope analysis. The purpose was to understand the hydrologic nature of a large stressed river flowing through an arid region. Rain samples, collected at 3 locations, showed large variations in δD between -61.6 ‰ and -28.6 ‰. The river was sampled on 3 occasions and showed little variations in δD between -103.7 ‰ and -98.4 ‰. Groundwater was collected during the rainy season and after a significant increase in river discharge. Groundwater collected near continually flowing portions of the river is composed of rain and river water. However, surprisingly the proportions were observed to fluctuate by almost 10 %. Groundwater collected near the river where it is most commonly dry is on average 4 ‰ more depleted in δD than samples from the San Joaquin River, and thus has no obvious origin. This groundwater may have been recharged during a pre-dam period.

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