

**Hydrogeology Journal – Electronic Supplementary Material**

**Critical evaluation of stable isotope mixing end-members for estimating groundwater recharge sources: case study from the South Rim of the Grand Canyon, Arizona, USA**

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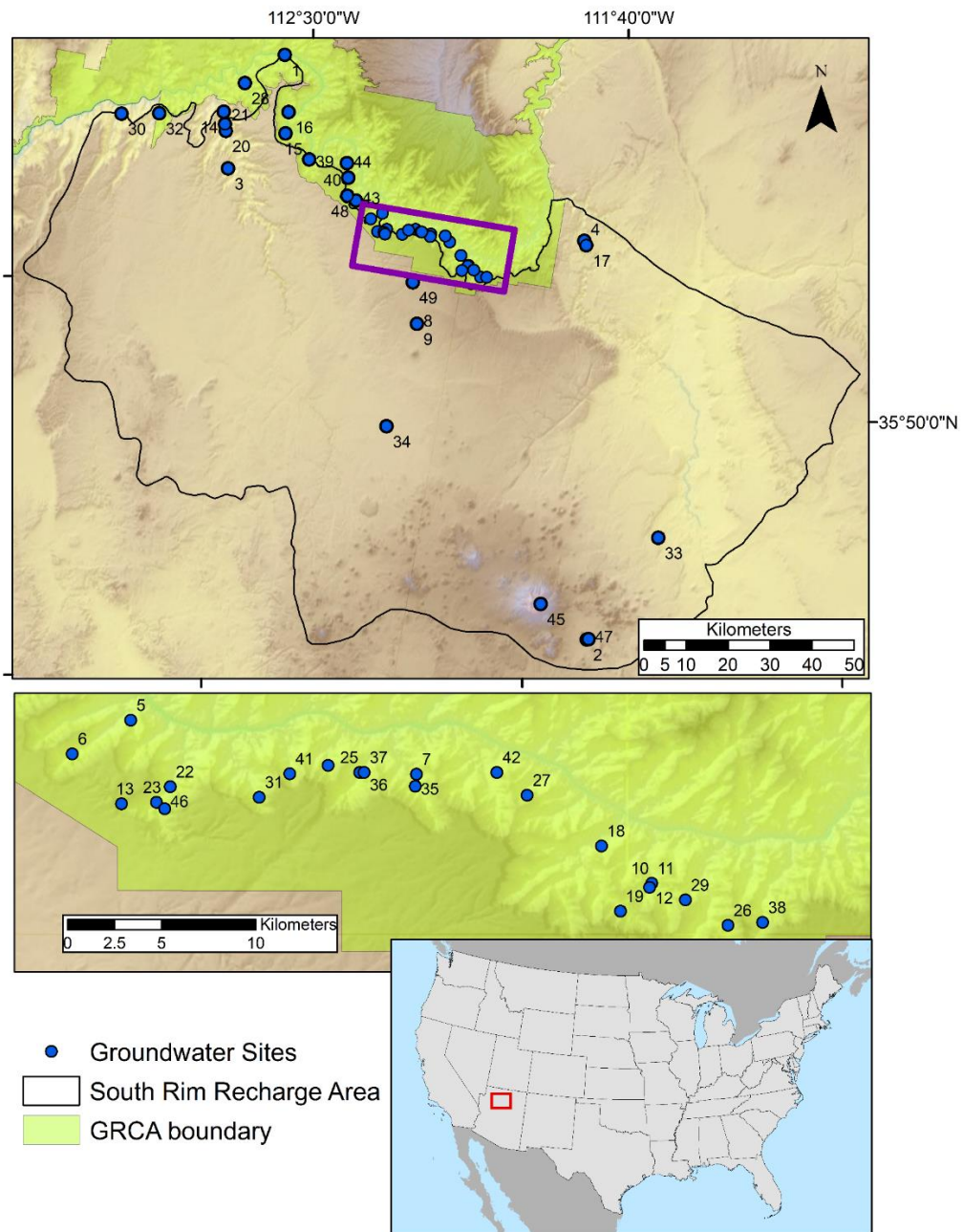


Fig S1. South Rim of the Grand Canyon, Arizona, study area overview. Groundwater sites (*numbers*) described in Table S1 of the Electronic Supplemental Material. Grand Canyon National Park (GRCA) and estimated recharge area to South Rim spring identified. Land-surface elevation (USGS, 2017; reference in main text) from ~500 m (*green*) to ~3900 m (*white*) indicated. Latitude and longitude (North American Datum 1983) indicated by *tick marks* and *labels*.

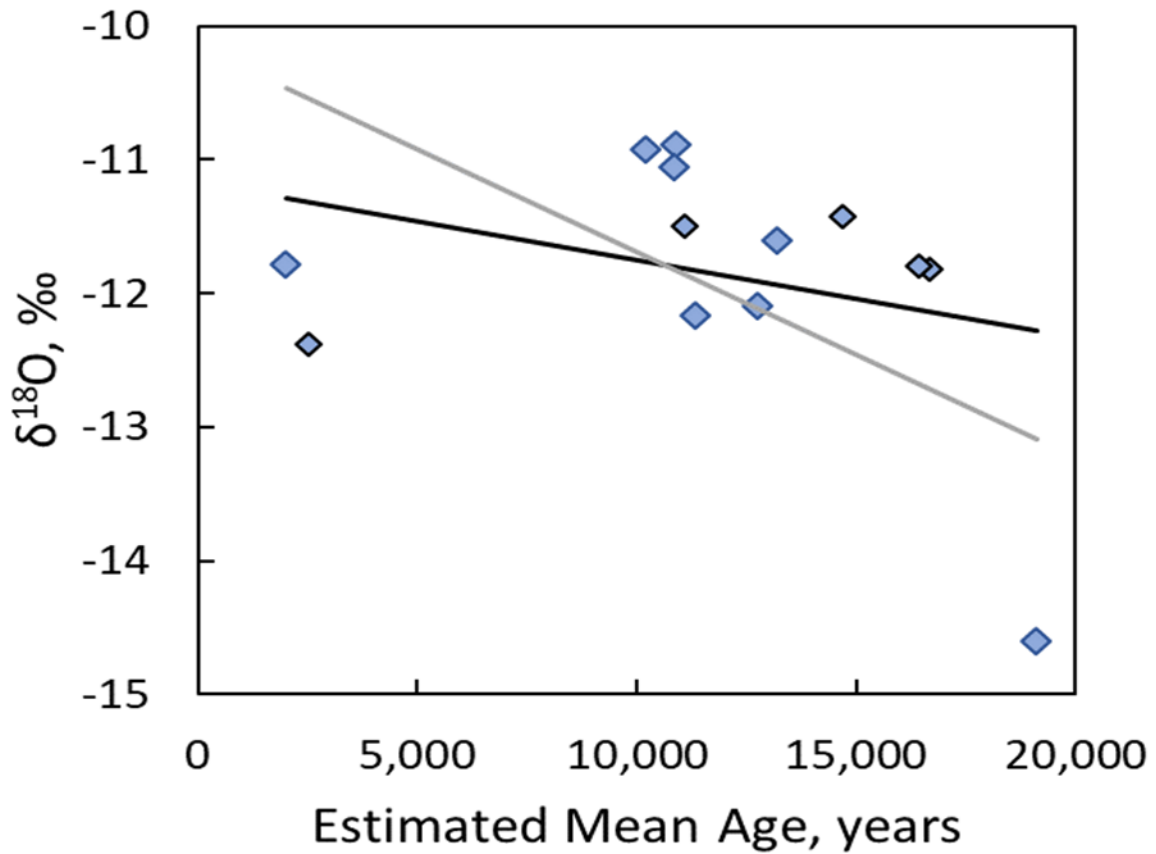


Fig S2. Tracer based groundwater age reported by Solder et al. (2020; reference in main text) versus groundwater  $\delta^{18}\text{O}$  for select sites (*blue border*) and large springs (*black border*). Regression line for select sites (*grey*) and all sites (*black*; equation reported in Table 3 of main text) indicated.  $\delta^2\text{H}$  is not displayed here for clarity but has a similar pattern.