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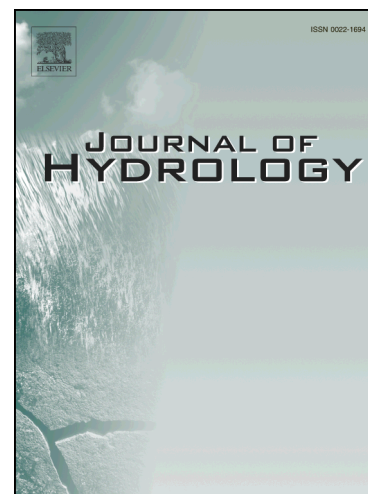
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Tracing groundwater recharge sources in the northwestern Indian alluvial aquifer using water isotopes ($\delta^{18}\text{O}$, $\delta^2\text{H}$ and ^3H)

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Abstract

Rapid groundwater depletion from the northwestern Indian aquifer system in the western Indo-Gangetic basin has raised serious concerns over the sustainability of groundwater and the livelihoods that depend on it. Sustainable management of this aquifer system requires that we understand the sources and rates of groundwater recharge, however, both these parameters are poorly constrained in this region. Here we analyse the isotopic ($\delta^{18}\text{O}$, $\delta^2\text{H}$ and tritium) compositions of groundwater, precipitation, river and canal water to identify the recharge sources, zones of recharge, and groundwater flow in the Ghaggar River basin, which lies between the Himalayan-fed Yamuna and Sutlej River systems in northwestern India. Our results reveal that local

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