

UC **SANTA BARBARA**
Department of Earth Science

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Deeper groundwater drilling an unsustainable solution to groundwater depletion

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Groundwater is critical to irrigated agriculture and domestic water access, and its importance is likely to grow as climate changes. Here, I show how continental-scale groundwater well reports offer “big-data” of local relevance, providing vital insights into hydrogeological conditions and groundwater-user decision making. For the first time, groundwater wells—the very infrastructure fundamental to withdrawing water from the subsurface—are mapped across the United States. These data indicate that wells are being constructed deeper over time across much of the country, with critical implications for domestic water security and agricultural yields. Drilling deeper wells can stave off the impacts of groundwater depletion, but only where hydrogeologic conditions permit it and for those who can afford it, suggesting that drilling deeper wells is an unsustainable solution, or stopgap, to water stress. This work lays the foundation for an ambitious research agenda focused on creating the first-ever global maps showing where groundwater is being used, where human water access is threatened, and the spectrum of formal and informal water rights to promote sustainable groundwater management.