EGU General Assembly 2020
Online | 4–8 May 2020

ASU School of Earth and Space Exploration
Arizona State University

Variations in vertical land motion, water storage & well levels: Implications for aquifer storage change

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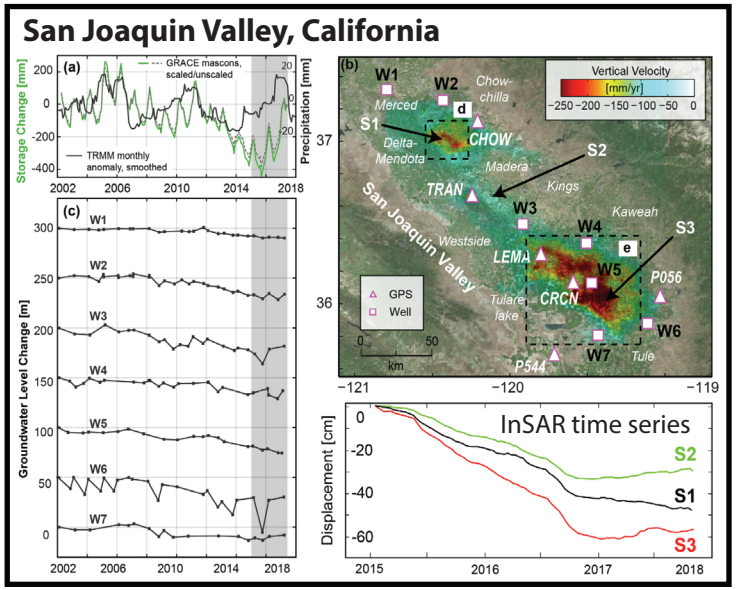
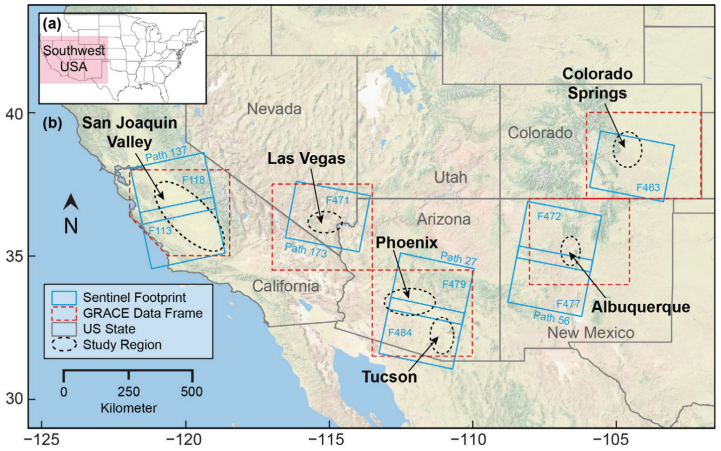
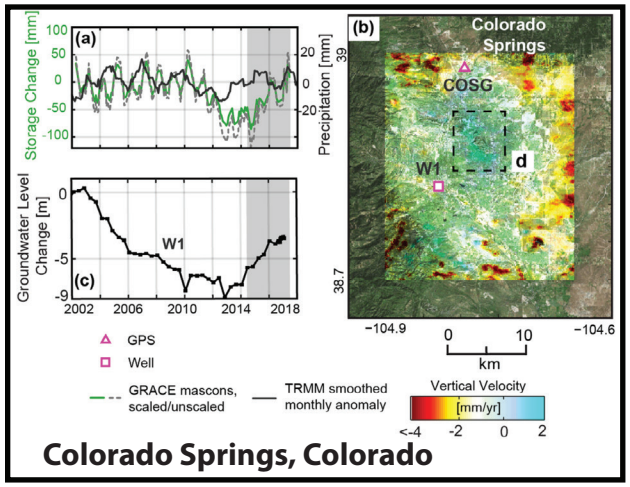
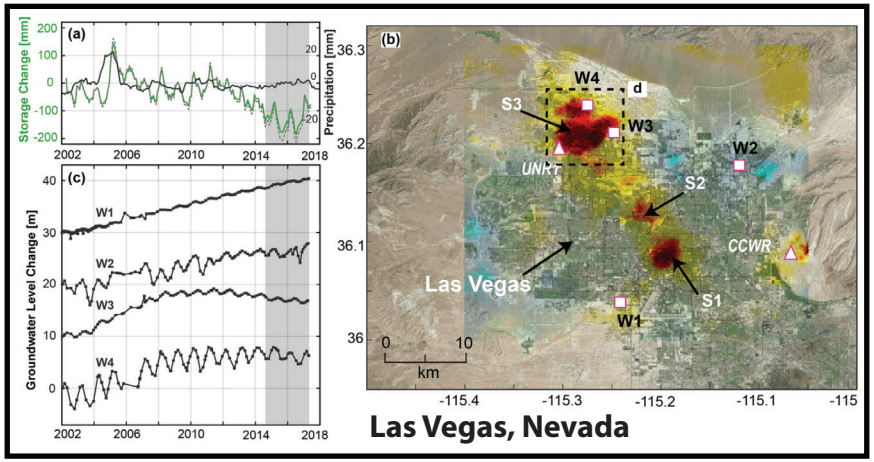
Objective: **Have aquifer-systems in Southwest US recovered from recent millenium drought (2012–2015)?**
Methods: Comparison of vertical land motion due to aquifer compaction with variables indicating state of aquifer storage
Data: Sentinel InSAR from December 2014 to August 2017, GRACE water storage variations, well levels, precipitation

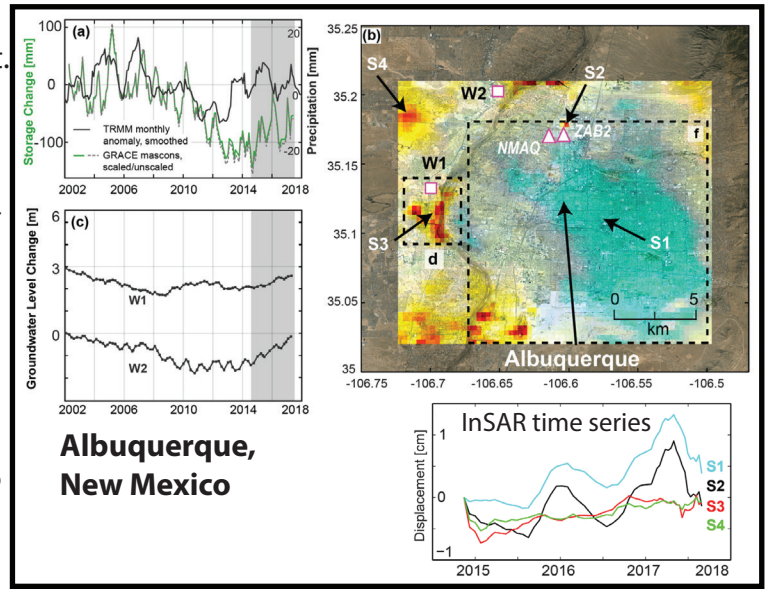






Findings: Frequent droughts and growing population in the Southwest US stress water resources and cause groundwater overdraft. Following droughts, the land subsidence might continue for years, even though different components of the hydrological cycle show a recovery, which is evident from groundwater levels, precipitation anomalies, and TWS variations. ***Residual compaction*** is variable depending on local hydrogeology and pumping history. This phenomenon ***has to be considered for integration of deformation and gravity data.***





More details, including results for Arizona Metropoles at: https://doi.org/10.1016/j.jhydrol.2020.124943 - Journal of Hydrology, 587 (2020), 124943.