

What do GRACE Satellites tell us about Drought Impacts in the Colorado River Basin....

GRACE satellites provide a relatively new tool to monitor changes in total water storage (TWS) in large basins; however, interpreting the hydrologic significance of these changes is often complicated. Here we evaluate GRACE TWS changes with the context of longer-term monitoring and modeling data in the Colorado River Basin to assess controls on water storage changes. The monitoring period (1970 – 2014) is generally characterized by decadal droughts (around 1990, early 2000s, and 2010s). The big difference between recent droughts since 2000 is limited drought recovery because of few anomalously wet years (2005, 2011) versus much more in the 1990s. GRACE data show large depletion of almost 40 km³ in 2011 - 2013 (6 – 12 km³/yr in upper and lower Colorado River basins, UCRB, LCRB). The primary approach to managing these wet and dry climate extremes is storing water, with ~ two years of water demand currently stored in the reservoirs. While water allocations have been met to date, continued drought may jeopardize junior water rights and require further coping strategies.



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