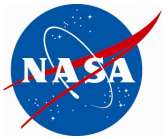
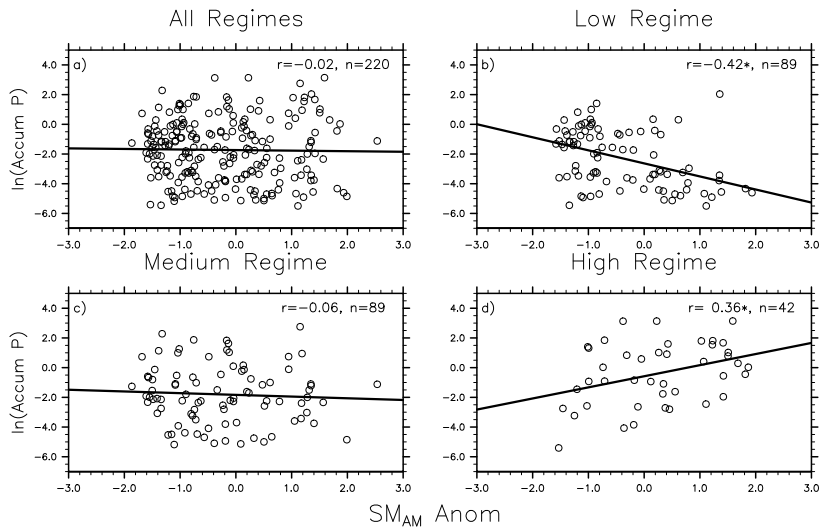


Soil Moisture Affects Warm Season Precipitation



Problem: Many papers have been published with conflicting results on the soil moisture (SM) effect on precipitation (P). We resolved this controversy using the comprehensive in situ measurements over the U.S. Southern Great Plains and the unique capability of NASA MERRA2 reanalysis (to quantify different dynamic regimes based on integrated water vapor tendency)



Finding: Precipitation is amplified over drier soils when dynamic influence (i.e. water vapor convergence) is suppressed (panel b).

Conversely, precipitation is enhanced over wetter soils when convergence is more pronounced (panel d).

There is no correlation between precipitation and soil moisture if all data are used (panel a)

Relationship between $\ln(P)$ and seasonal standardized anomaly of morning SM under different dynamic regimes for JJAS 2002-2011.

Impact: Ideas from this study are subsequently used to evaluate the SMAP soil moisture effect on precipitation over different regions of the world.