

4b.6 Predictability of the 2012 US Drought in a different representation of atmospheric processes

PaiMazumder, Debasish and James Done, *National Center for Atmospheric Research*

The 2012 drought was the most severe and extensive summertime drought in half a century, surpassing 1934, 1936, and 1988, and resulting in over USD 12 billion in US economic loss and substantial indirect impacts on global food security and commodity prices. A unique aspect of the 2012 drought was its rapid onset and intensification over the southern Rockies and Central Plains during late spring/early summer, and the absence of known precursor large-scale patterns. Drought prediction therefore remains a major challenge. In this study, the predictability of drought is explored using preseason soil-moisture and snowmelt. For the southern Rockies, a correlation between winter and spring snow melt anomaly and summer soil moisture anomaly is found over the period 1982-2011, and persists for year 2012. This suggests the summer 2012 drought over southern Rockies was predictable several months in advance based on the relationship between soil moisture-snowmelt. This relationship is investigated in an atmospheric physics ensemble of long-term simulations using the state-of-the-art Weather Research and Forecasting Model (WRF). Specifically, the robustness of the relationship to model uncertainty is explored and the potential predictability of the drought by the ensemble is assessed.