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Toward Earlier Drought Detection Using Remotely Sensed Precipitation Data and Application to the Carolinas

This study evaluates the feasibility of using satellite precipitation data from the REDR program (CMORPH-CDR) to detect and monitor drought on a global scale from 1998 to present. Monthly and daily (running mean) Standardized Precipitation Indexes (SPI) were implemented and computed over various time scales (1-, 3-, 6-, 9-, 12-, and 24-month resp. 30-, 90-, 180-, 270-, 360-, and 720-day). Preliminary results indicated that both monthly and daily SPIs presented the same timing and area for the major droughts episodes over the continental United States as well as for selected drought events around the globe. The SPI is evaluated primarily over CONUS where long-term drought monitoring exists based on in situ data. Showcases of selected severe drought events were used for validation (1998-2004 western US drought, 2006-2007 Southeastern US drought, 2010-2012 Texas-Mexican drought, 2012 summer Midwestern US drought). Following the assessment metrics in the NIDIS Drought Task Force (DTF) Protocol, each drought product is evaluated on the basis of its ability to estimate the onset and recovery, duration and severity, probability of drought condition, and the value given at the observed period.

In this poster presentation, we focus on the Carolinas and neighboring Southern States for which we provide an assessment and evaluation of the CMORPH-CDR derived SPI and in-situ drought monitoring products such as the United State Drought Monitor (USDM), the nClimGrid derived SPI, and the WestWide Drought Tracker (WWDT) derived from PRISM (Parameter-elevation Regression on Independent Slopes Model) data. Finally, we will present an interactive visualization tool that will allow easy comparison of the results for the selected drought events with the 2006-2007 Southeastern US drought as an example.