

Utilizing GRACE Total Water Storage, NDVI, and Precipitation for Drought Identification and Classification in Texas

SPEAKER: Sarah E. McCandless (CSR)

DATE: August 19, 2014 – Tuesday – 3:00 PM

LOCATION: Conference Room 2.806,
WPR Building, 2nd Floor
3925 W. Braker Lane, Suite 200, Austin, Texas 78759

ABSTRACT: The “Merged-dataset Drought Index” (MDI) is a new quantitative drought index calculated using the GRACE total water storage (GRACE TWS), MODIS-derived normalized difference vegetation index (NDVI), and precipitation data. These datasets constitute MDI because each correlates with a different drought type. Dataset deviations from established climatology are used, where negative deviations indicate deficits. MDI is objectively and transparently calculated based on dataset z-scores. GRACE TWS is the least mature dataset used in these calculations, but TWS solution variance does not negatively impact MDI. A new classification scheme to categorize drought severity is also proposed. MDI is studied in Texas and its smaller sub-regions. Within these sub-regions, MDI identifies multiple droughts during 2002-2014, with the most severe beginning in late 2010. Drought analysis using MDI shows for the first time that GRACE data provides information on a sub-regional scale in Texas, an area with low overall signal amplitudes. Past studies have shown TWS capable of identifying drought, but MDI is the first index to quantitatively use GRACE TWS in a manner consistent with current practices of identifying drought. MDI also establishes a framework for a future, completely remote-sensing based index that can enable temporally and spatially consistent drought identification across the globe. This study is useful as well for establishing a baseline for the necessary spatial resolution required from future geodetic space missions for use in drought identification at smaller scales.

Authors: Sarah E. McCandless, Srinivas Bettadpur, Teresa Howard, Gordon Wells

Coffee & cookies will be served
For further information, please contact 471-5573
Future Seminars: <http://www.csr.utexas.edu/seminars>