CTB Seminar

9:30-10:30am, 19 November 2015

NOAA Climate Test Bed Seminar Series

Speaker:

Ken Mitchell, Ph. D.

Prescient Weather Ltd., State College, PA

Retired, EMC/NCEP

Time:

9:30am-10:30pm, 19 November 2015

Location:

NOAA Center for Weather and Climate Prediction, Conference Room 2890

5830 University Research Court

College Park, MD 20740

Remote Access:

https://www1.gotomeeting.com/join/714576893

Meeting ID: 714-576-893

Conference call: 1-877-680-3341

Passcode: 858747

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Drought Monitoring with the NCEP North American Land Data Assimilation (NLDAS): Implications and Challenges of Extending the Length of the Climatology

ABSTRACT

The NCEP Environmental Modeling Center (EMC) has developed and implemented the North American Land Data Assimilation System (NLDAS) for monitoring and S2S prediction of droughts (and floods) over the Continental United States (CONUS) in support of NIDIS. The NLDAS initiative began in the late 1990's and achieved A) a 3-year (1996-1999) retrospective demonstration by 2004, B) a realtime experimental capability by 2008 and C) formal NCEP operational status in early August 2014, thereby culminating NLDAS Phase 2 ("NLDAS-2"). The long-term NLDAS thrust has succeeded via the support of the NOAA Climate Program Office (CPO), via the MAPP (formerly CPPA) and CTB programs. Herein, CPO has supported more than 15 NLDAS federal and academic partners, including the NCEP/CPC, NASA Hydrological Sciences Lab, NCAR/RAP, U.S. Air Force (non CPO), and Princeton, Texas A&M, Rutgers, and Michigan State universities, plus the universities of Washington, Maryland, Arizona, Oklahoma and more.

The NLDAS-2 drought monitor is executed daily by NCEP and produces daily, weekly and monthly CONUS fields of the anomaly and percentile values of soil moisture, snow water equivalent (SWE), total runoff, streamflow, evaporation and precipitation, all in ensemble mode via execution of four land surface models (LSMs: Noah, Mosaic, SAC, and VIC) on a common 1/8th degree grid (~ 14 km) using common hourly land surface forcing. The foundation of the anomaly and percentile fields is the NLDAS-2 climatology, which is currently a 28-year climatology (1980-2007) that was produced by 28-year retrospective runs of each NLDAS-2 LSM. EMC has now produced a longer, 36-year experimental NLDAS-2 climatology (1979-2014), which includes several recent severe drought episodes (e.g. California, Texas, others). We show that replacement of the 28-year with the 36-year climatology has surprisingly strong impacts on the derived anomaly and (especially) percentile fields of key drought events. Thus, we are investigating (and will show early results from) various methods for deriving an "optimal climatology" (such as the method of Narapusetty *et al.*, 2009, J. Climate), by means of which a new NLDAS climatology (e.g., updated routinely about every 5 years) would exhibit suitably less impact on the percentile fields in "before and after" comparisons for well-known historical drought episodes.