CTB Seminar

1:00-2:00pm EST, 8 June 2016

NOAA Climate Test Bed Seminar Series

Speaker:

Dr. Kingtse C. Mo

Climate Prediction Center

NOAA/NWS/NCEP, College Park, MD

Time:

1:00-2:00pm EST, 8 June 2016

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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Flash Droughts over the United States

ABSTRACT

Flash drought refers to relatively short periods of warm surface temperature and anomalously low and rapid decreasing soil moisture (SM). Based on the physical mechanisms associated with flash droughts, we classify these events into two categories: heat wave and precipitation (P) deficit flash droughts. We study flash droughts based on the UCLA/UW P and surface temperature (T_{air}) analyses and SM and evapotranspiration (ET) reconstructed using land surface models. The base period is from 1916 to 2013. Both types of flash droughts are manifested by SM deficits, which cause damage to crops. Therefore, both are agricultural droughts.

The heat wave flash droughts are initialized by the warm air temperature, which increases ET, and decreases soil moisture (SM). The preferred regions for heat wave flash droughts to occur are the North Central, the Ohio Valley and the Pacific Northwest. They tend to occur in the vegetation dense areas.

The P deficit drought is initialized by P deficits. The lack of P decreases SM. In the areas where SM and ET anomalies have a linear relationship, ET decreases. That leads to the increase of sensible heat and high temperature. In this sense, high temperatures are the consequence of P deficits. P deficit flash droughts are more common than heat wave flash droughts. They are most prevalent over the southern United States with maxima over the Southern Great Plains and the Southwest.

The CFSv2 seasonal forecasts are able to capture the preferred regions for flash droughts to occur. However, the model over forecasts flash drought events of both types in comparison to analyses.

Accelerate the transfer of research and development into improved NOAA operational climate forecasts, products, and applications.