CGD SEMINAR

NCAR

DATE: Friday, 28 February, 2020

TIME: 1:30 – 2:30 PM

LOCATION: NCAR, Table Mesa Drive
Main Seminar Room

TITLE: **The MJO in CESM2: Mean-State, Coupling and Unexpected Sensitivities**

SPEAKER: **Richard Neale, NCAR**

The Madden Julian Oscillation (MJO) is the primary mode of intraseasonal, convectively coupled wave variability in the tropics, and has teleconnection impacts around the globe. With its spontaneous, intermittent and multi-scale nature it represents a unique challenge for course resolution GCMs. Given its emerging importance in extending forecast predictability, monitoring the MJO performance during model development, as with other important modes of variability, is paramount.

In the Community Earth System Model (CESM2), the MJO is now a well simulated feature, in terms of propagation speed, strength and regional coherence. However, the improvement is only in the presence of an interactive ocean. When observed SSTs are prescribed in the atmosphere model (CAM6) the MJO is largely absent, similar to CESM1 and CAM5. This makes any attribution due to 'improved' atmospheric processes challenging. MJO signal coherence degrades when the hourly coupling frequency is returned to the CESM1 value of daily; confirming previous work on the role of SST anomaly coupling.

However, this is not the end of the story for CESM2. A range of modifications to surface forcings that drive CAM6 (including SSTs and the maritime continent specifications), reveal that the requirement for interactive surface coupling may not be critical for the model's MJO. We show how the atmospheric basic state changes in response to surface forcing, and how critical aspects including the poleward humidity gradients, surface fluxes and changes in process tendencies are able to support MJO events. A continued science focus on the MJO remains an important endeavor, especially given its somewhat dramatic response in future climate simulations.

Live webcast: https://www.ucar.edu/live

For more information, contact Tracy Baker, tbaker@ucar.edu, 303.497.1366