MMM SEMINAR SERIES

Subseasonal-to-seasonal variability of severe convective storms: a complex and multiscale problem

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A number of multiscale physical processes drive the variability of winter and spring severe convective storm (SCS) activity. These processes are influenced by different phases of the El Niño-Southern Oscillation (ENSO) and Gulf of Mexico (GoM) sea surface temperatures (SSTs).

Using a series of composites with partitioned years of above and below average SCS activity, it is shown that both El Niño and La Niña can lead to increases in SCS frequency through jet stream modulations. However, there is much variability in these established relationships; some events stray far from canonical ENSO impacts. Some of the reasons why this established relationship fails to capture variability of SCSs will be discussed.

SCSs also rely on low level moisture for thermodynamic support. Positive (negative) GoM SST anomalies increase (decrease) evaporative fluxes, leading to more (less) moisture loading on overlying air masses. These air masses can be subsequently advected towards the CONUS, influencing SCS frequency through low level moisture availability. Climate features of the GoM, such as the Loop Current and warm core rings, are factors in this relationship.

Finally, a Lagrangian-based methodology for moisture attribution of SCSs will be shared. Results from this study show that the moisture sources of SCSs are not limited to the GoM. These results present implications to SCS operational forecasts and subseasonal-to-seasonal predictions alike.

Thursday, 6 December 2018, 3:30 PM

Refreshments 3:15 PM!

NCAR-Foothills Laboratory
3450 Mitchell Lane
FL2-1022, Large Auditorium

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