# CPAESS Discovery Seminars

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## Simulation of Mesoscale Convective Systems Using GFDL's New High-Resolution General Circulation Model

**DATE:** Wednesday, July 19, 2023

**TIME:** 11:00 AM - 12:00 PM MDT (VIRTUAL)

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This presentation provides evaluation results of the mesoscale system convective simulated in high-resolution (25-km and 50-km) GFDL AM4.

Mesoscale convective systems (MCSs) play important roles in the hydrological cycle and global circulation through redistribution of heat, moisture, and momentum in the atmosphere. They are often observed in heavily raining areas of the tropics and subtropics, as well as mid-latitude continents along prominent baroclinic zones. Despite ongoing efforts to improve model performance, accurately simulating MCS remains difficult in general circulation models (GCMs). However, recent studies have highlighted the potential for substantial improvements in GCMs with grid spacing finer than 100-km, particularly in capturing the synoptic-scale environment that significantly influences the modeling of MCSs and their characteristics. In our analysis, we first evaluate the statistics of MCSs simulated by a global ~50-km atmospheric GCM developed at GFDL, focusing on tropical regions. Encouraging results from this evaluation motivated us to investigate the simulated MCSs over the central US, a hotspot with frequent MCS occurrences typically observed in the afternoon and/or evenings. Additionally, we explore the impact of horizontal resolution (25-km versus 50-km) on the simulated MCSs.