MMM SEMINAR SERIES

The intensification of thunderstorm straight line winds with climate change

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Straight-line winds (SLWs), known as non-tornadic thunderstorm winds, pose significant threats and cause widespread damage globally. These extreme gusts arise from intense downdrafts in thunderstorms, rear inflow jets, and mesovortices. Despite their impact, our understanding of how climate change influences SLWs remains limited. Focusing on the central United States, a renowned hotspot for SLWs, this study utilizes observations, high-resolution modeling, and theoretical frameworks to elucidate trends over the past four decades. Theoretical estimations suggest SLWs should intensify at approximately 7.5 % per degree Celsius, yet empirical observations reveal a more pronounced increase of around 13 % per degree Celsius. Simulation outcomes further indicate a substantial 4.8±1.2-fold expansion in the geographic footprint affected by SLWs during the study period. These findings underscore the imperative of integrating increasing SLW occurrences into climate change adaptation strategies to fortify the resilience of future infrastructure development.

Thursday, 4 April 2024, 2:00PM
Refreshments 1:45PM
Please also join colleagues for refreshments and informal discussion after the seminar until 3:30pm
NCAR-Foothills Laboratory, 3450 Mitchell Lane
FL2-1022, Large Auditorium
Seminar will also be live webcast
https://operations.ucar.edu/live-mmm
Participants may ask questions during the seminar via Slido.