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Connecting Urbanization to Precipitation: the case of Mexico City

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Considerable evidence exists illustrating the influence of urban environments on precipitation. We revisit this theme of significant interest to a broad spectrum of disciplines ranging from urban planning to engineering to urban numerical modeling and climate, by detailing the simulated effect of Mexico City's built environment on regional precipitation. Utilizing the Weather Research and Forecasting (WRF) system to determine spatiotemporal changes in near-surface air temperature, precipitation, and boundary layer conditions induced by the modern-day urban landscape relative to presettlement conditions, I mechanistically link the built environment-induced increase in air temperature to simulated increases in rainfall during the evening hours. This simulated increase in precipitation is in agreement with historical observations documenting observed rainfall increase. These results have important implications for understanding the meteorological conditions leading to the widespread and recurrent urban flooding that continues to plague the Mexico City Metropolitan Area.