



Precipitation sensitivity to the microphysical and surface schemes as modeled by the WRF-ARW regional model over the Mexico City Metropolitan Area.

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Intense precipitation (>20mm/hr) over the Mexico City Metropolitan Area (MCMA) has seen its frequency and timing changed substantially over the last 60 years of recorded hourly precipitation.

A frequency increase has mainly been observed where high rates of urban development have taken place over the recorded period. Also, the initiation of intense precipitation has shifted from late night hours towards the afternoon from the 60s towards the 90s. Notably, by 2009, 77% of intense events occurred between 7pm and midnight reverting back to conditions only seen in the 40s.

In this study, two alternative hypotheses are adopted, namely, that observed changes in precipitation patterns and intensity are the result of different type and emission of aerosol pollutants present in different periods in the past and that urbanization-induced land surface changes have also been a major player. To that end the regional atmospheric model WRF-ARW has been used over the MCMA to study the sensitivity of precipitation patterns to the amount of CCNs present and to surface characteristics of the MCMA evolving in time.