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## Urban Growth and its Relationship with Severe Weather Conditions over the Metropolitan Area of São Paulo (MASP) - Brazil.

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The potential increase in convective activity and severity, caused by urban heat island effect, is verified in this work with tests using BRAMS model, based on the construction of different urbanization scenarios and on the use of the Town Energy Budget parameterization. Present and two future urban scenarios, based on Sao Paulós municipality master plan, were constructed in order to analyse possible impact on formation and development of a severe weather case occurred over the Metropolitan Area of Sao Paulo (MASP). Future urban scenarios for 2030 considered 1) horizontal growth without changes in the heights of actual buildings and; 2) a situation that all actual constructions of small dimensions could be replaced by high rising buildings (vertical growth). These scenarios were used to evaluate changes in rainfall, convective parameters, and consequently, in severe weather probability for the study region. Using the factor separation method, it was found that the urban area growth is capable to increase the amount of precipitation, mainly due to the land use change from rural to urban. In the scenario of building heights increasing, it was found a tendency for rainfall suppress. The horizontal urban area growth for 2030 is the major factor contributing to increase atmospheric instability and wind shear. The results also show that vertical urban growth can cause different impacts on atmospheric stability and wind shear. When considering the interaction between two factors it is possible to observe an increase in the amount of precipitation and storm motion to other parts of MASP.

**Publication:**

American Geophysical Union, Fall Meeting 2019, abstract #GC21H-1406

**Pub Date:**

December 2019

**Bibcode:**

2019AGUFMGC21H1406F

**Keywords:**

3307 Boundary layer processes; ATMOSPHERIC PROCESSES;  
0414 Biogeochemical cycles; processes; and modeling;  
BIOGEOSCIENCES; 1630 Impacts of global change;  
GLOBAL CHANGE; 1631 Land/atmosphere interactions;  
GLOBAL CHANGE

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