

Lightning enhancement in the Amazon region due to urban activity

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ABSTRACT

Urbanization has an increasing contribution to anthropogenic climate forcing. The impact arises mainly from the Urban Heat Island (UHI) effect and aerosol anthropogenic emissions. An important but not completely understood consequence of this forcing is its effect on local lightning activity. Changes in lightning activity may result in a feedback on the climate system. In this article it is investigated changes in the lightning activity in the city of Manaus, located in the Amazon region of Brazil. It is found that over the city the lightning activity is larger than in the regions around it and it has been increasing in the last four decades simultaneously with the increasing of its urban area. Our results suggest that such changes are caused by the UHI effect. The observations reported here are unique and relevant because Manaus is located in the central part of the Amazon rainforest and inside one of the three global lightning chimneys in the world.