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Urban Climates and Climate Change

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Abstract

Cities are particularly vulnerable to extreme weather episodes, which are expected to increase with climate change. Cities also influence their own local climate, for example, through the relative warming known as the urban heat island (UHI) effect. This review discusses urban climate features (even in complex terrain) and processes. We then present state-of-the-art methodologies on the generalization of a common urban neighborhood classification for UHI studies, as well as recent developments in observation systems and crowdsourcing approaches. We discuss new modeling paradigms pertinent to climate impact studies, with a focus on building energetics and urban vegetation. In combination with regional climate modeling, new methods benefit the variety of climate scenarios and models to provide pertinent information at urban scale. Finally, this article presents how recent research in urban climatology contributes to the global agenda on cities and climate change.

Keywords: urban climate, urban heat island, climate change, extreme weather events, crowdsourcing, urban veget

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