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Climate Change Projections For Central America: A Regional Climate Model Study

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Abstract
Central America has been identified as one of the regions in the world where potential climate change impacts on the environment can be pronounced and is considered a climate change 'hot-spot'. The Intergovernmental Panel on Climate Change Fourth Assessment Report indicates that the region around the western Caribbean and Central America is one where a majority of the climate model simulations indicate rather large changes in temperature and precipitation. This region, however, is one with considerable topographic relief, which implies the

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existence of large gradients in many critical climate variables. The interactions between the complex topography of Central America and the neighboring oceans give rise to numerous climate zones, horizontally and vertically. Consequently, the region has high biodiversity, it harbors high-value ecosystems and it is important to provide more realistic scenarios to assist in adaptation and mitigation work in the region. In this study, I aim to understand climate change in Central America at spatial scales relevant for impacts assessment.

A regional climate model PRECIS was employed to carry out two experiments: the baseline (present-day) run and the scenario run, both performed at 25-km horizontal resolution. The thorough examination of the model performance showed model's success in capturing the spatial and temporal variability of the key climate variables and its strength in simulating topographically-induced regional climate features. The projected increase in temperature, a large decrease in precipitation in most of Central America, and corresponding hydrological changes under the A2 scenario may have serious negative consequences on water resources, agricultural activities and the ecosystem dynamics in the region.

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