Comparison of Regional Climate Model Simulations to Observational Data for Georgia

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The global climate change resulting from natural and growing anthropogenic factors of particular importance for the territory of Georgia as the frequency and intensity of extreme weather events (extreme high temperatures, heavy precipitation levels, and agricultural and ecological droughts) are increasing in the territory. Georgia’s complex orography and proximity to the Black and Caspian Seas necessitates the use of high-resolution models, such as regional climate models, to assess future climate change hazards. In this study, we analyse the output from high-resolution simulation of mean and extreme precipitation and temperature using the Abdus Salam International Centre for Theoretical Physics Regional Climate Model version 4.7.1 for the period of 2010–2014 as an initial assessment of model performance for the territory. The simulation is performed at a 12 km horizontal grid spacing using ERA5 data as boundary conditions. Comparison with observed station data shows that the model performs better in simulating the monthly mean and extreme values of temperature than precipitation. In some mountain stations, the biases between observation and simulated precipitation are high, partly due to the mountainous terrain, when the horizontal resolution of the model (12 km) can lead to a significant discrepancy between the model’s points and the locations of weather stations.

This study represents the first step of Georgia’s first high resolution assessment to better understand how climate change will impact the territory required to climate change policy and decision-making.

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