High-Resolution Climate Modeling for Regional Impact Assessment

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Abstract

This study presents a high-resolution climate model for assessing regional impacts of global warming. We analyze temperature and precipitation patterns across different geographical regions and project future climate scenarios under various emission pathways.

Introduction

Climate change poses significant challenges to ecosystems and human societies. Accurate regional climate projections are essential for adaptation planning. Global climate models provide valuable insights but often lack the spatial resolution needed for local impact assessment. We developed a regional climate model with 10km resolution, downscaling from global models. Our simulations incorporate detailed topography, land use, and ocean-atmosphere interactions. Results indicate significant regional variations in warming patterns and precipitation changes. Coastal regions show particular vulnerability to sea-level rise and extreme weather events.