



## **A Matter of Scale: Climatic Assessment of Projected Urban Expansion and Adaptation in California 2100**

Matei Georgescu

Arizona State University, Global Institute of Sustainability, School of Geographical Sciences and Urban Planning, United States (matei.georgescu@asu.edu)

Recent projections indicate the U.S. will add about 300 million inhabitants through the end of the current century, leading to roughly 250,000km<sup>2</sup> of new urban land use to meet the increase in commercial, housing, and transportation demand. Multi-year and multi-member continental scale numerical simulations are conducted with the WRF model, for the U.S., to assess impacts owing to end of century megapolitan expansion, and to examine consequences of commonly proposed adaptation strategies. Warming of 1-2°C is simulated for all expanding urban areas, with local warming exceeding 3°C for some regions during some seasons. Widespread adoption of adaptation strategies exhibit regionally and seasonally dependent hydroclimatic impacts, displaying intended effects for some urban areas while exhibiting unintended consequences for others. To assess the multi-scale dependency of simulated results, high-resolution (2km grid spacing) seasonal timescale simulations are conducted for urbanizing regions in California (USA). In addition to emphasizing the need for integrated assessment that also incorporates biophysically induced urban impacts, I argue in favor of examining scale dependency of simulated outcomes to comprehensively address tradeoff assessment of various urban adaptation approaches, with important hydroclimatic implications extending to potential impacts for air quality.