

Presentation Information

Presenter	Marina Alberti
Title	Urbanization Patterns and Carbon Fluxes: A Coupled Human-Natural System Approach to Study Process and Mechanisms
Affiliation	University of Washington
Authors	Marina Alberti, Hutyra Lucy

Abstract:

The relationships between urbanization and ecosystem function are governed by complex interactions and feedback mechanisms between human decisions and ecological processes (Alberti 2008). These mechanisms are mediated by patterns of urbanization and infrastructure. Yet there are very few data available to systematically evaluate how alternative patterns of urban development (i.e., centralized versus sprawling) interact with ecosystem processes across multiple biomes. Empirical data and evidence of mechanisms linking urban patterns and ecosystem function are critical to inform urban planning and management. We present a coupled human-natural system framework to identify the mechanisms that link urban patterns to ecosystem function, specifically focusing on land-atmosphere carbon fluxes along gradients of urbanization. The framework is designed to empirically test hypotheses of how alternative development patterns may impose different carbon signatures (spatial and temporal changes in stocks and fluxes) and how these signatures may in turn influence patterns of urbanization. We focus on two key aspects that couple urban patterns to carbon: vegetation dynamics and travel behavior. Using examples from two metropolitan bioregions: Seattle (moist temperate) and Phoenix (arid), we articulate hypotheses and discuss empirical data about complex interactions of the coupled human-natural processes that result in carbon emissions or sequestration, and how these interactions may impact future regional changes.