



Building Cities that Think Like Planets Using Simulation and Scenario Planning

Premise: *Cities must rethink themselves in the context of planetary change.* Over the past century, the “great acceleration” of human activities has initiated fundamental ecosystem shifts that far exceed the natural range of variability exhibited during the Earth’s previous half-million years. Cities across the globe are driving systemic changes in socio-ecological and technological systems altering the interactions and feedbacks between the fundamental ecological and evolutionary processes that maintain life. Increasing evidence shows that cities are causing rapid evolutionary change in many species that maintain the ecosystem functions upon which human communities depend.

Proposition: As drivers of planetary change, cities are at the forefront of global climate change and can accelerate systemic climate responses. Yet the new reality represents uncharted territories for urban scholars and practitioners. The assumptions made by the theories and models that inform urban decision makers (i.e., that the urban systems will respond predictably to environmental changes) are built upon evidence of a world that no longer exists. The emergence of complex interactions among human, natural, and technological systems and the uncertain trajectories that characterize urban futures require that urban scientists and planners critically review their assumptions and ask new questions.

Challenge: How do we design complex hybrid socio-ecological urban systems in which the components are highly heterogeneous and interdependent? How can we build resilient urban infrastructures that are equipped to thrive in conditions of uncertainty and capable to adapt to any of the possible but unknown future climate change scenarios? How can we effectively coordinate the actions of multiple stakeholders operating at many scales under a diversity of constraints? How do we ensure a just and equitable transition towards a sustainable urban future?

Approach: To navigate the inherent complexity and uncertainty of hybrid urban systems, we must expand our drawing boards to include planetary processes and scales. Scenario planning offers a systematic and creative approach to thinking about the future. Scenarios can help communities develop a new capacity for dealing with the unpredictable. Simulation can bridge the gap between science and design of coupled human-natural systems that accounts for their co-evolutionary dynamics.

University of Washington
Department of Urban Design and Planning

Online Summer Course 2023 (Hybrid)

B-term Jul 20 - Aug 18 (4 credits)

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Scope: Using real case examples we will explore dynamics of coupled human-natural systems in urbanizing regions. We will learn how to apply simulation and scenario planning to assess the effectiveness of planning strategies under alternative futures.

Skills: Students will earn concepts of complexity theory and principles of systems dynamic and resilience and apply them to urban systems design and operation.

Tools: We will demonstrate how simulation modeling and scenario planning can inform robust city systems' design under uncertainty.

Students: **Undergraduate and graduate students** from any department or program with an interest in urban ecology, eco-evolution, and environmental planning. The course will be suitable for both students without previous coursework in the field who are highly motivated and open to expand their perspective on urban design and city planning and advanced graduate students who are engaged in research in the field of urban ecology and environmental planning. The course is also suitable for **urban managers and planners** interested in learning strategic foresight and experimenting with prototyping future scenarios.



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