



Presented By:
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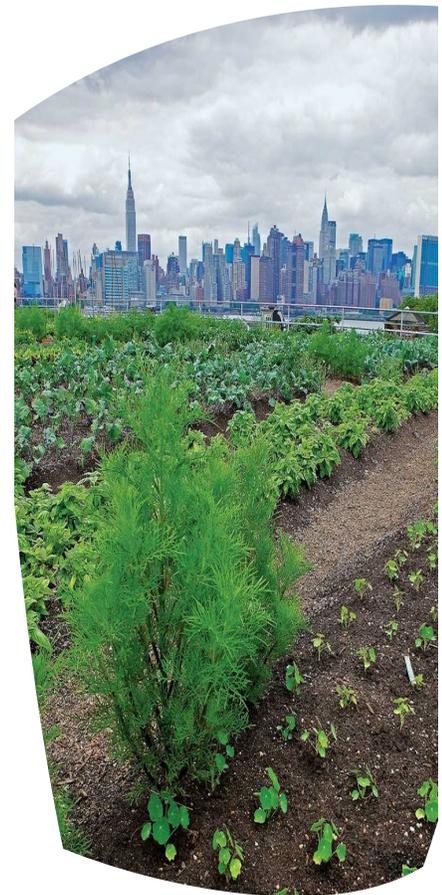
Department of
Civil and Environmental
Engineering

Environmental Engineering *Seminar Series*

Friday, November 3, 2017
McDonnell Douglas Engineering Auditorium (MDEA)
1:30PM to 2:30PM

The Role of Green Infrastructure In Sustainable Urban Development: Modeling & Implications

Today, urban areas are home to more than half of the world's population, with a projected urban population of 6.3 billion (68% total global population) in 2050. The concentration of population in urban areas has positively affected the economic growth, with generation of more inventions and business ideas. Concomitant with the rapid global urbanization, changes of land use land cover types combined with modified land surface processes, have significant impacts on urban environmental and engineered systems, leading to excessive thermal stress, degradation of water/air quality, and increase in building energy consumption in cities. To mitigate the adverse environmental impact, researchers, practitioners, and city planners have designed multiple forms for "greening" the built environment by increase the abundance of vegetation, popular landscaping strategies including lawns, sidewalk trees, parks, rooftop gardens, and urban agriculture and forestry, to name a few. In this seminar, we will discuss the state-of-the-art numerical modeling techniques of the biogeophysical functions of popular urban green infrastructure, highlighting their contributions and limitations in the light of climate-energy-water repercussions. In addition, we will discuss some of the open challenges in urban climate modeling in general, including the scale effect and the nonlinearity in land-surface interactions that are further complicated by the presence of vegetation. Ongoing research activities on optimizing design and implementation of urban green infrastructure are highly informative to practitioners, planners and policy makers for sustainable development of cities in the future.



Dr. Zhihua Wang is an Assistant Professor in the School of Sustainable Engineering and the Built Environment, and a senior sustainability scientist at the Global Institute of Sustainability at Arizona State University. Dr. Wang obtained B.Eng. (2002) and M.Eng. (2004) degrees from the School of Civil and Environmental Engineering at Nanyang Technological University in Singapore, and M.A. (2008) and Ph.D. (2011) degrees from the Department of Civil and Environmental Engineering at Princeton University. His primary research interest is on the urban environment under the changing climate, including urban climate modeling, urban infrastructure, energy-water nexus, and sustainable development of cities. He has published 58 peer-reviewed papers in many prestigious journals in civil and environmental engineering, hydrometeorology, geophysics, and atmospheric science, and numerous conference presentations and invited talks at various professional institutes. Dr. Wang is currently serving as the Co-director for Climate System Research at the U.S. Environmental Protection Agency-designated National Center of Excellence on SMART Innovations. He is an active member of American Society of Civil Engineers (ASCE), American Geophysical Union (AGU), American Physical Society (APS), American Meteorological Society (AMS), and International Association of Urban Climate (IAUC). Dr. Wang served as a board member of AMS' Urban Environment Board in 2014-2016. His academic services also include organization and coordination of academic conferences, and providing expert reviews for book proposals, journal papers, and grant proposals for several U.S. federal agencies including National Science Foundation, National Aeronautics and Space Administration, Army Research Office, and Environmental Protection Agency.