Announcing the Final Examination of Qi Lu for the degree of Master of Science

Time & Location: June 30, 2017 at 9:00 AM in Engineering 2 442K
Title: Linking Climate Change and Socio-economic Impact for Long-term Urban Growth in Three Mega Cities

Urbanization has become a global trend under the impact of population growth, socioeconomic development, and globalization. However, the interactions between climate change and urban growth in the context of economic geography are unclear due to missing links in between within the recent urban planning megacities. This study aims to conduct a multi-temporal change analysis of land use and land cover in New York City, City of London, and Beijing using a cellular automata-based Markov chain model collaborating with fuzzy set theory and multi-criteria evaluation to predict the city's future land use changes for 2030 and 2050 under the background of climate change. To determine future natural forcing impacts on land use in these megacities, the study highlighted the need for integrating spatiotemporal modeling analyses, such as Statistical Downsampling Modeling (SDSM) driven by climate change, and geospatial intelligence techniques, such as remote sensing and geographical information system, in support of urban growth assessment. These SDSM findings along with current land use policies and socio-economic impact were included as either factors or constraints in a cellular automata-based Markov Chain model to simulate and predict land use changes in megacities for 2030 and 2050. Urban expansion is expected in these megacities given the assumption of stationarity in urban growth process, although climate change impacts the land use changes and management. More land use protection should be addressed in order to alleviate the impact of climate change.

Major: Environmental Engineering

Educational Career:
Bachelor's of Urban planning and public affairs, BA, 2015, University of Illinois at Chicago

Committee in Charge:
Ni—Bin Chang, Chair, Civil, Environmental, & Construction Engineering
Martin Wanielista, Civil, Environmental, & Construction Engineering
Kelly Kibler, Civil, Environmental, & Construction Engineering

Approved for distribution by Ni-Bin Chang, Committee Chair, on June 9, 2017.

The public is welcome to attend.