



In Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy
Sainan Zhang

Will defend her dissertation

**Socio-Ecological Drivers and Consequences of Land
Fragmentation
Under Conditions of Rapid Urbanization**

Abstract

Land transformation under conditions of rapid urbanization has significantly altered the structure and functioning of Earth's systems. Land fragmentation, a characteristic of land transformation, is recognized as a primary driving force in the loss of biological diversity worldwide. However, little is known about its implications in complex urban settings where interaction with social dynamics is intense. This research asks: How do patterns of land cover and land fragmentation vary over time and space, and what are the socio-ecological drivers and consequences of land transformation in a rapidly growing city? Using Metropolitan Phoenix as a case study, the research links pattern and process relationships between land cover, land fragmentation, and socio-ecological systems in the region. It examines population growth, water provision and institutions as major drivers of land transformation, and the changes in bird biodiversity that result from land transformation.

How to manage socio-ecological systems is one of the biggest challenges of moving towards sustainability. This research project provides a deeper understanding of how land transformation affects socio-ecological dynamics in an urban setting. It uses a series of indices to evaluate land cover and fragmentation patterns over the past twenty years, including land patch numbers, contagion, shapes, and diversities. It then generates empirical evidence on the linkages between land cover patterns and ecosystem properties by exploring the drivers and impacts of land cover change. An interdisciplinary approach that integrates social, ecological, and spatial analysis is applied in this research. Findings of the research provide a documented dataset that can help researchers study the relationship between human activities and biotic processes in an urban setting, and contribute to sustainable urban development.

Wednesday, April 10th, 2013
12:00 pm
Wrigley Hall, Room 401

Faculty, students, and the general public are invited.

Supervisory Committee:

Dr. Christopher G. Boone, Chair
Dr. Abigail M. York
Dr. Soe Myint