



In Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy
Yun Ouyang

Will defend his dissertation

**Relationship between Single-family Residential Water Use and Its
Determinants: A Spatio-Temporal Study of Phoenix, Arizona**

Abstract

The dynamics of urban water use are characterized by spatial and temporal variability that is influenced by associated factors at different scales. Thus it is important to capture the relationship between urban water use and its determinants in a spatio-temporal framework in order to enhance our understanding and management of urban water demand. This dissertation aims to contribute to understanding the spatio-temporal relationships between single-family residential (SFR) water use and its determinants in a desert city in three ways. First, I demonstrate that aggregated scale data can be reliably used to study the relationship between SFR water use and its determinants without leading to significant ecological fallacy. The usability of aggregated scale data facilitates scientific inquiry about SFR water use with more available aggregated scale data. Second, this dissertation advances our understanding of the relationship between SFR water use and its associated factors by accounting for the spatial and temporal dependence in both panel and cross-sectional settings and at different temporal scales. Third, this dissertation also contributes to SFR water use modeling by introducing spatial panel data models and evaluating different regression models. This dissertation demonstrates the importance and necessity of incorporating spatio-temporal components, such as scale, dependence, and heterogeneity, into SFR water use research with advanced spatial statistical models.

Friday, September, 20, 2013
2:00pm
WGHL, 401

Faculty, students, and the general public are invited.

Supervisory Committee:

Elizabeth Wentz, Co-Chair
Benjamin Ruddell, Co-Chair
Sharon Harlan
Marcus Janssen