



In Partial Fulfillment of the Requirements for the Degree of

**Doctor of Philosophy**  
**Melissa Guardaro**

Will defend her prospectus

**Exploring the Relationship between Social Capital and  
Vulnerability to Extreme Heat**

**Abstract**

Urban heat is a growing problem that impacts public health, water and energy use, and the economy and affects population subgroups differently. Exposure and sensitivity, two key factors in determining vulnerability have been widely researched and mapped. This dissertation will focus on the adaptive capacity component of urban heat vulnerability at the individual, household, and community level. Using a mixed methods approach, I will try to understand more completely how vulnerable communities understand and adapt to increasing extreme urban heat to uncover adaptive capacity that is not being operationalized well through current heat vulnerability indices. Social capital, an important component in heat adaptation, will be explored in the context of urban heat through communities of place and communities of practice. While social capital has been measured in a multitude of ways to gauge social relationships, trust, and reciprocity within a community, this component is situational and reflects how you are positioned within the formal and informal aspects of any issue. Therefore, I will develop social capital indicators that are specific to urban heat. Harlan (2015) found that residents in highly heat vulnerable neighborhoods have less trust and networks among neighbors and are unable to work collectively to advocate for localized urban heat mitigation and adaptation solutions. A methodology to co-create heat action plans was implemented in three highly vulnerable metropolitan Phoenix neighborhoods. Findings from extended interviews on adaptive capacity and focus group research on social capital will be applied to this community engagement process to determine if and how adaptive capacity and social capital are influenced. Understanding how heat is managed on an individual, household, and neighborhood basis can inform public policies, minimize poor public health outcomes, enhance adaptive capacity, and provide avenues for greater thermal comfort for the most vulnerable populations.

Thursday, October 4, 2018  
3:00pm  
Wrigley 323

Faculty, students, and the public are invited.

Supervisory Committee:  
Dr. Charles Redman, Chair  
Dr. David Hondula, Member  
Dr. Erik Johnston, Member  
Dr. Ray Quay, Member