



In Partial Fulfillment of the Requirements for the Degree of  
**Doctor of Philosophy**  
**Eric Vahid**

Will defend his prospectus

**The Impacts of Residential Flood Irrigation on  
Nitrous Oxide Emissions in Maricopa County, AZ**

**Abstract**

Nitrogen is one of the most important elements on Earth, and, being what makes up parts of DNA and protein, is essential for all life. Understanding the factors that influence how nitrogen cycles through the atmosphere, soils, plants, and animals, is therefore extremely important. The first goal of my research will be to understand how flood irrigation, yard management, and plant/soil dynamics affect Nitrous Oxide emissions in residential properties in the wider Phoenix, AZ region. The second goal will be to determine if the benefits we believe we receive from flood irrigation (such as less water usage compared to drip and riser systems, and cooler microclimates) are actually present in practice. I will also measure what factors lead to the existence or non-existence of these perceived benefits. The third goal will be to create a comprehensive data set and systems diagram that encompasses all of the relevant factors that influence Nitrous Oxide emissions and flood irrigation benefits. The overarching goal is to produce a data set that provides enough information for individuals, policy makers, and utility companies in the wider Phoenix region to make informed decisions about how to reduce the amount of Nitrous Oxide emissions from residential yards, while encouraging sustainable water use practices.

Friday, November 22, 2019  
12:00 pm  
Wrigley Hall Room 102

Faculty, students, and the public are invited.

Supervisory Committee:

Dr. Dan Childers (Chair)  
Dr. Sharon Hall (Member)  
Dr. David Sailor (Member)