This thesis sheds light on coupling potential flood risk and drainage infrastructure resilience of low-lying areas of a coastal urban watershed to evaluate flood hazards and their possible driving forces. Copulas analyses with the aid of joint probability of simultaneous occurrence help characterize the complexity for hazard classification with subsequent exposure, under varying levels of adaptive capacity. Adaptive measures of consideration include traditional flood proofing structures and low impact development facilities for a coastal urban watershed, the Cross Bayou watershed, near Tampa Bay, Florida. Findings indicate that the coupling flood risk and infrastructure resilience is achievable by the careful formulation of flood risk associated with a resilience metric, which is a function of the hazard(s) considered, vulnerability and adaptive capacity. The results also give insights into improving existing methodologies for municipalities in flood management practices such as incorporating multi-criteria flood risk evaluation that includes resilience.

Major: Environmental Engineering

Educational Career:
Bachelor's of Civil Engineering, BS, 2012, University of California, Irvine

Committee in Charge:
Ni—Chang, Chair, Civil, Environmental and Construction Engineering
Martin Wanielista, UCF Department of Civil, Environmental and Construction Engineering
Talea Mayo, UCF Department of Civil, Environmental and Construction Engineering

Approved for distribution by Ni-Chang, Committee Chair, on May 25, 2017.

The public is welcome to attend.