



## **Professor Qiong 'Jane' Zhang Receives \$1.96M NSF CRISP Grant**

*The research focuses on critical infrastructures identified in Presidential Policy Directive 21*

Associate Professor Qiong 'Jane' Zhang of the Dept. of Civil and Environmental Engineering received a four-year \$1.96 million grant for a project titled "CRISP Type 2: Integrative Decision Making Framework to Enhance the Resiliency of Interdependent Critical Infrastructures." CRISP stands for Critical Resilient Interdependent Infrastructure Systems and Processes, the mainstay of the nation's economy, security and health, which are interdependent.

Dr. Zhang's project will try to reduce the cascading failures due to the interdependencies among different critical infrastructures or to enhance the resiliency of interdependent critical infrastructures. There are 16 Critical Infrastructure (CI) sectors identified by [Presidential Policy Directive 21](#). The reliable functioning of infrastructures is critical to national security and fundamental to social, economic, and environmental well-being.

The goal of the proposed research is to develop an integrative decision making framework with consideration of physical-based, virtual-based, and socioeconomic-based interdependencies between water, transportation and cyber infrastructures for evaluating strategies to enhance the resiliency of interdependent critical infrastructures.

Dr. Zhang's Sustainability Computational Modeling Research Group focuses on sustainability assessment and system modeling, with applications in water systems, wastewater and resource recovery systems, and the water-energy nexus. Other researchers include from Civil & Environmental Engineering - Qing Lu, Yu Zhang, post doc Shima Mohebbi; Xinming Ou from Computer Science & Engineering; Mingyang Li from Industrial & Management Systems Engineering; and Eric Wells of Anthropology.

"An area of region that will most benefit from the CRISP project is City of Tampa since the models developed as part of this CRISP will be systematically evaluated using historical data from the City of Tampa," said Zhang. "Tampa is a large and fast-growing metropolitan region in a water-stressed environment (with notably depleted aquifers), and provides an excellent site for the proposed research because it has extensive infrastructure in place for water, transportation and cyber."

Moreover, water and transportation infrastructures are currently managed and regulated by separate agencies, although both rely on the same cross-cutting cyber infrastructure. Finally, the institutions overseeing these infrastructures are organized differently in terms of decision making, which creates both opportunities and challenges for critical infrastructure management. The integrative decision making framework, however, is transferable to other regions for the evaluation of design, operation and organizational infrastructure management decisions.

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