Announcing the Final Examination of Yong Je Kim for the degree of Doctor of Philosophy

Time & Location: November 4, 2019 at 10:00 AM in ENG2 211P
Title: Probabilistic Spatio-Magnitude Sinkhole Hazard Analysis for East Central Florida

In Karst areas, sinkhole is one of major geohazards that creates damage and economic loss in civil infrastructure. The proposed study is aimed at developing a probabilistic spatio-magnitude sinkhole susceptibility model that predicts the potential of sinkhole occurrence in a regional scale. To achieve this goal, several quantitative approaches including frequency ratio (FR), logistic regression (LR), and artificial neural network (ANN) methods were used. Seven important contributing factors to sinkhole occurrence in the ECF region were identified and used as input variables to the sinkhole hazard model and map as well. They are hydraulic head difference between surficial and confined aquifers, groundwater recharge rate to the upper Floridan aquifer, soil permeability, overburden thickness, surficial aquifer system (SAS) thickness, intermediate aquifer system (IAS) thickness, and proximity to karst features. Both FR and LR were used to construct the spatial prediction models for sinkhole susceptibility mapping and ANN was used to develop a probabilistic spatio-magnitude sinkhole hazard model. The prediction accuracy of all models was validated by area under the receiver operating characteristic (ROC) curve (AUC) analysis. Subsequently, a comprehensive spatio-temporal-magnitude sinkhole hazard model was proposed to integrate three probabilities of location, time, and size of sinkholes.

Major: Civil Engineering

Educational Career:
Bachelor’s of Civil Engineering, BS, 2007, University of Illinois at Urbana-Champaign
Master’s of Civil Engineering, MS, 2010, University of Illinois at Urbana-Champaign

Committee in Charge:
Boo Hyun Nam, Chair, Civil, Environmental, & Construction Engineering
Luis Arboleda Monsalve, Civil, Environmental, & Construction Engineering
Dingbao Wang, Civil, Environmental, & Construction Engineering
Qipeng Phil Zheng, Industrial Engineering & Management Systems

Approved for distribution by Boo Hyun Nam, Committee Chair, on October 11, 2019.

The public is welcome to attend.