MODELING THE IMPACTS OF AGRICULTURAL MANAGEMENT PRACTICES ON GROUNDWATER IN THE SANTA FE RIVER BASIN

***Dogil Lee*[1], *Nathan Reaver*[2], *Rob de Rooij*[2], *Sagarika Rath*[1], *David Kaplan*[3] *and Wendy D. Graham*[1,2]**

[1]Department of Agricultural and Biological Engineering, University of Florida, Gainesville, Florida, USA

[2]Water Institute, University of Florida, Gainesville, Florida, USA

[3]Environmental Engineering Sciences Department, University of Florida, Gainesville, Florida, USA

Aquifers throughout the world are damaged by over-pumping and nutrient enrichment. In particular, the Floridan Aquifer of the southeastern U.S., has experienced increasing agricultural and urban water withdrawals and nutrient load from human activities. Agriculture has been identified as a large groundwater user and a primary source of nutrients in groundwater, springs and streams in the Santa Fe River Basin, which overlies the Floridan Aquifer in North Florida. Grazed pasture, row crops, and hay fields are the major agricultural land uses in the basin. Quantifying the impacts of alternative water and nutrient management practices for these land uses is important for understanding the potential changes needed to improve groundwater quantity and quality in the region. The main objectives of this study are to model the hydrologic system in the Santa Fe River Basin using the Soil and Water Assessment Tool (SWAT) and to evaluate nitrate leaching, groundwater recharge, and crop yield from row crops, hay fields and grazed pasture. Farm-scale management practices in SWAT were calibrated using available data from corn-peanut rotation, corn-carrot-peanut rotation, and Bermuda grass cultivation experiments. Three management practices scenarios were established to analyze the effects of agricultural management practices on quality and quantity of groundwater which feeds the Santa Fe River and its springs. The results of this study will be useful for incentivizing growers to adopt management practices with lower water and nutrient footprints, and for establishing a model to estimate water quality and quantity of the Santa Fe River depending on land management and land use changes.

PRESENTER BIO: Dogil Lee is a third year PhD student in the Agricultural and Biological Engineering Department at the University of Florida. His research interests include field and watershed scale modeling of the impacts of agricultural management practices on water quality and quantity.