

## **Interfacing a Novel Water Quality Model with a Variable-Density, Coupled Surface and Groundwater Model for the Southern Everglades**

Stuart Muller<sup>1</sup>, Rafael Muñoz-Carpena<sup>1</sup>, Andrew James<sup>2</sup>, Eric Swain<sup>3</sup>, Gregory Kiker<sup>1</sup> and Jim Jawitz<sup>4</sup>

<sup>1</sup>Agricultural & Biological Engineering, UF; <sup>2</sup>SWET, Gainesville, <sup>3</sup>USGS, Ft.Lauderdale; <sup>4</sup>Soil & Water Science, UF

Since adoption of the Comprehensive Everglades Restoration Plan (CERP), management of water quality in the Everglades and adjacent coastal waters of Florida Bay, particularly with regard to nutrients such as phosphorus, has become an essential objective. Nutrient dynamics in southern Florida wetlands are dependent on the unique biogeochemistry and hydrology of the region. The objective of this work was to link a new water quality model, the Transport and Reaction Simulation Engine (TaRSE), with FTLOADDS, an existing variable-density coupled surface and groundwater model. TaRSE was successfully integrated with FTLOADDS, from which it obtains the necessary hydrodynamic (stage and flow) data. The combined model was applied to a generic testing site to verify accurate linking of the TaRSE and FTLOADDS components. Results indicate the correct coupling of the water quality and hydrological models, and that the tool is ready to be applied to an existing field site in the region where FTLOADDS has already been calibrated and verified for. There was no previously existing water quality model available for simulation of phosphorus reactions and transport in the domain of the Everglades National Park, thus the successful pairing of TaRSE and FTLOADDS represents an important development for the agencies involved in management and research of this critically important ecological region.

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