

Brief Description of the North Florida Unstructured Grid Model (NFUSG) Project

The NFUSG Project is a groundwater flow model development project that was initiated by the SRWMD in 2014 to create a new groundwater flow model that is calibrated to multiple steady-state boundary conditions, and that is implemented with the latest version of the unstructured-grid formulation of U.S. Geological Survey Modular Groundwater Flow Model, MODFLOW USG. The original project deadline has been extended by the SRWMD to allow for completion of the North Florida Southeast Georgia (NFSEG) groundwater flow model, and to allow for demands on SRWMD staff time associated with development of that model. The primary objective of the NFUSG project at this point is to serve as a platform for (1) evaluating the benefits of explicit representation of conduits and their upstream and downstream connections to streams, (2) evaluating the benefits of local grid refinement, (3) development of useful information and tools for translation of a potential MODFLOW-USG implementation of NFSEG or other models with structured grids, and (3) possibly limited regulatory, planning, or MFL use to aid in the evaluation of well-mapped but difficult to simulate systems such as Falmouth Spring.

The NFUSG has been constructed by extracting the volume of the NFSEG domain shown in fig. 1. Therefore, the NFUSG grid, boundary conditions, and hydrostratigraphic conceptualization is essentially identical to that of the NFSEG model, except as follows: local (quad-tree) grid refinement was introduced around important features, such as springs, rivers, and a limited set of larger withdrawals (length of the side of grid cells around these features has been reduced from 2500 to 625 feet), and a GHB boundary condition has been applied to the northern lateral boundary condition. Although data defining the location of conduits and connections between swallets and springs is generally very limited, the construction of the NFUSG model incorporated MODFLOW USG Connected Linear Network (CLN) Process features to explicitly represent four conduit systems: Santa Fe River Sink-to-Rise, Falmouth Spring, Ichetucknee Trace, and Dead River. The next step in the development of the NFUSG model is to complete implementation of preprocessing and postprocessing necessary for initiation of PEST calibration efforts.

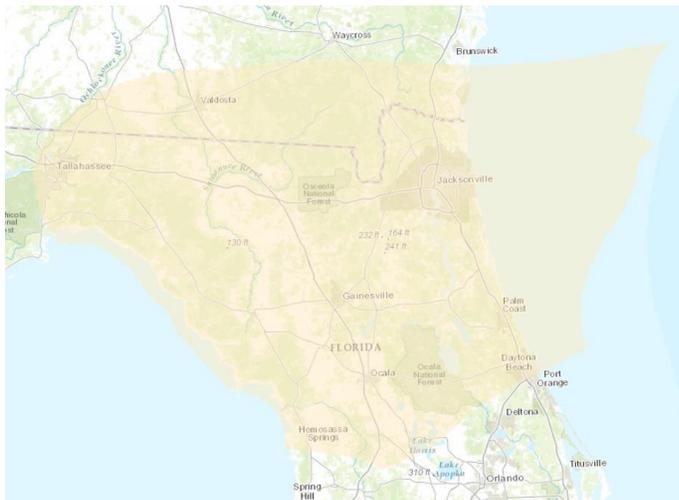


Figure 1. Extent of NFUSG active model grid