

2.3.5. Hydrology

Hydrology was generated for both the approximate models and the 2D model region using the Green Ampt method. The difference between the application of these two methods is that in the approximate studies using Advanced Interconnected Channel and Pond Routing Model (ICPRv3) there is a separate module for calculating runoff which is subsequently called, or referenced in the hydraulics module. The basin hydrology requires area inputs by basin for each unique soil and land use combination. In contrast, ICPRv4 calculates the hydrology and hydraulics at the same timestep, internally splicing the bulk soils and land use coverage by honeycomb (2D basin). Simulating the hydrology and hydraulics simultaneously provides the benefit of enabling the interaction of runoff and infiltration from adjacent cells to dynamically adjust available soil storage.

It is of note that simulations using ICPRv4 have a mechanism to recover the soil moisture through the dynamic extraction of water through evapotranspiration. This dynamic approach allows better simulations of longer term events. Unlike the ICPRv3 models which will not recover the soil moisture until the rainfall stops, which often has the opposite effect of fully recovering the soil storage too rapidly.

2.3.6. Hydrology QA/QC

Quality control was performed on the hydrology results and hydrologic parameterization through visual inspections of runoff hydrographs, reviews of land use conditions in the watershed for relative consistency against aeriels and comparisons of modeled runoff volumes to anticipated runoff volumes.

2.4. Hydraulic Feature Inventory

2.4.1. Hydraulic Feature Inventory Development Process

As previously defined, the Withlacoochee River Watershed is a combination of three model types, which include completed detailed studies, approximate studies, and the 2D region analysis.

- Detailed Studies – Models approved by the SWFWMD and having completed an extensive peer review process, were taken, “as is” without additional detailed review. However, the down gradient limits of the study may have been adjusted if the area was covered by the

2D Region. Adjustments included truncating the detailed model and adjusting tailwater conditions as appropriate.

- Approximate Studies – Simulated for planning units without completed detailed studies to provide watershed inflows. Development of these models relied heavily upon digital techniques analyzing the digital terrain and limited field investigations.
- 2D region – Comprises the 2D model domain (Withlacoochee River and adjacent floodplain, Green Swamp, Tsala Apopka and Lake Panasoffkee) and the East Citrus Withlacoochee River Watershed.

Data for model development came from the following sources:

- GIS data from previous studies, the SWFWMD, National Hydrographic Dataset (NHD), Forest Service, municipal culvert inventories, etc.
- Digital Terrain – developed from SWFWMD acquired LiDAR between 2003 and 2007, supplemented with marsh, lake, and channel hydrography.
- Structure Surveys – available from field investigations both in the areas of approximate studies and 2D region.
- Environmental Resource Permits – for relevant roadways and developments of significance to the model inflows.
- SWFWMD data collection – River profile, culvert data collection and marsh survey data.
- Structure Profiles – Within the 2D model domain, 17 operable structures were simulated with data from SWFWMD structure profile reports and operational data from field data sheets recorded during the verification event.
- Google ®/ Bing ® Maps – supplementing the Digital Elevation Model (DEM) and field observations, used to assist with generating approximation and presence of structures present in approximate studies.

For the approximate studies, the naming convention for basins, nodes and links begins with an association to the SWFWMD planning unit name through a two digit assigned ID. The ID and corresponding planning unit name is listed in **Table 2-6**. Also, within the model, each element is assigned a model group using the same two digit ID for convenience. To keep the models at a manageable size, the approximate studies were split into five separate ICPR models, using logical topographic breaks to divide up the models. Combining models in this fashion enabled interconnections between planning unit models to occur without the need for excess boundary conditions. **Table 2-6** lists the ICPR model associated with each planning unit. Note: Some planning units fall in multiple models. This was done to retain the logical topographic split, while remaining consistent with the SWFWMD original planning unit designations.