NFSEG V1.1 IMPROVEMENTS

DRAFT

Improvement	Objective	Approach	Benefit Of Improvement
Update river and drain package	Increase model stability; minimize unrealistically high flux exchanges among boundary conditions; improve simulated flux distribution along rivers	Merge multiple river BC in one cell; implement a different river and drain conductance adjustment approach; Check isolated Drain Package features	Aims to minimize the unrealistically high flux exchanges among boundary conditions (which was one of the major concerns of technical team). Increases model stability, decreases run time, eliminates conflicting boundary conditions within same cell
Update and recalibrate HSPF models	Improve HSPF simulations in critical areas; increase confidence in overall simulated water budget for critical subwatersheds; Improve recharge and maximum saturated ET estimates; reduce uncertainty in recharge	Improve poor fit of observed streamflow hydrographs in critical subwatersheds; align conceptualization of HSPF with real system in watersheds with rivers sustained by discharge from UFA	Increase confidence in recharge estimates by incorporating comments expressed during Tech Team review, specifically inconsistencies between adjacent HSPF models/basins
Improve simulated SAS water levels	Increase confidence in model's ability to assess impacts on wetlands and potential indirect recharge projects	Identify locations in the model where simulated SAS water levels are unrealistically high or low; Develop synthetic SAS targets based on water levels estimated using review of wetland coverages and more recent data	Correct obvious deficiencies where groundwater levels were simulated much lower (or higher) than physically possible or would be inferred by review of soils/USGS quad maps, etc. Correcting these will inherently increase stakeholder confidence in the model's ability to assess wetland/surficial aquifer impacts
Reassess the use of MNW2 package for modeling multi-aquifer wells	Increase model stability	Remove MNW2 wells with zero flows; review simulated fluxes from MNW2 package; develop an alternative approach to simulate multi-aquifer wells if necessary	Decreased run time, initial review/testing appears to indicate the wells as specified are satisfactory
Improve simulated spring flows	Improve simulated flows at selected springs; add capability of simulating a priority spring that was not included in the original model; improve predictive accuracy of flow changes in springs	Add Crescent Springs and Rock Sink Springs (missing priority spring); Improve poor fit to the selected spring flows (absolute residual > XX% of estimated flow); review and update (as necessary) target spring flows and/or pool elevations	Increased confidence in model's predictions in spring flows.
Improve baseflow simulations in the groundwater model in critical areas	Improve accuracy of predictions of flow changes at critical stream gages	Review and update (as necessary) baseflow estimates at selected stream gages and river reaches; investigate the watersheds where groundwater could not simulate baseflows reasonably well	Increased confidence in model and predictions, particularly with respect to flowing systems and application of model to their assessment.
Improve point-source recharge distribution	Improve recharge estimates; better simulate natural recharge in closed basins	Review and reassign injection wells representing natural point-source recharge to the appropriate aquifer if needed; update layer 3 well package injections in closed basins as necessary; convert some of point-source recharge to areal recharge	Eliminate potential concern of direct injection to UFA in closed basins where there may not be a clear distinction this transfer is happening via an active sink/swallet (like Alachua Sink)
Improve aquifer parameter estimates in the model	Improve confidence and reduce uncertainty in model predictions	Review parameters that are hitting their upper or lower bounds in PEST and adjust these bounds (or make other adjustments) if justifiable by hydrogeological settings; improve ICU leakance estimates in critical areas	Addresses tech team comments that certain areas in UFA are hitting their bounds and the appropriateness of bounds we have set. Increases confidence in simulating pumps-off scenario
Null Space Monte Carlo Uncertainty Analysis	Quantify Model/Predictive Uncertainty	DD, FG, TG work with Watermark/John Doherty to set up process and implement	Uncertainty analyses were conducted for Version 1.0. Based on verbal comments made during tech team meetings, it is anticipated that a similar and/or more comprehensive evaluation will be required to support V 1.1

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