



MEETING SUMMARY

Subject: Peer Review Teleconference – Meeting 13 (Review of Final Steady-State Calibration)

Expanded East Central Florida Transient (ECFTX) Groundwater Model

Date: May 21, 2018 (1 PM to 4 PM)

Prepared By: Central Florida Water Initiative (CFWI) Hydrologic Analysis Team (HAT)

Attendees:

Panel Members: Pete Andersen (Chair), Lou Motz, Mark Stewart

Districts staff: Pete Kwiatkowski, Uditha Bandara, Jeff Giddings, Tim Desmarais, Wei Jin, Doug Hearn, Adam Angel, Jason Patterson, Joanne Chamberlain, Ron Basso, Brian Starford, Lori Burklew, Chris Leahy, Joanna Oseguera, Qing Sun, Lou Donnangelo

FDEP: Pam Flores

Utility Representatives: Oscar Vera, David Macintyre

FDACS Consultant: Steven Memberg

General Public: None

The purpose of this meeting is to present to the Panel the Districts' final steady-state calibration for the ECFTX Model (11-layer steady-state model). NOTE: PowerPoint slides for presentations made at the meeting have been posted to SWFWMD's peer review web board.

Pete Kwiatkowski (PK) welcomed the meeting participants and noted that the steady-state calibration is an important interim milestone and that staff is seeking concurrence from the Panel regarding moving forward with transient calibration. Chairman Pete Andersen (PA) inquired as to the use of automated calibration (PEST) in this version of the calibration, and Ron Basso (RB) indicated that staff used manual calibration only to achieve calibration. Steady-state run times are less than one hour. Uditha Bandara

(UB) made a presentation regarding updated agricultural water use, an AFSIRS code correction, and updated ET-recharge-runoff using AFSIRS. Steven Memberg (SM) requested that permit-level agricultural water use be aggregated and provided to him. UB indicated that further adjustments to 2003 NEXRAD rainfall, which was adjusted spatially based on rain gauges and presented to the Panel in last meeting, were made in three areas including northern Tampa Bay, Lake Wales Ridge, and Seminole Ridge. Panelist Mark Stewart (MS) noted that NEXRAD is an algorithm-derived rainfall estimate so staff should not be apologetic about making further adjustments that better match rainfall gauge data. UB indicated these changes and curve-number adjustments were essential to resolve chronically low water levels in these areas. UB also summarized his efforts to ensure mass balance was maintained. Panelist Lou Motz (LM) inquired as to whether NEXRAD adjustments will be made for the transient simulation and UB indicated we will look at the data and decide. Jason Patterson (JP) noted that preliminary review indicates that post 2005 NEXRAD adjustments may not be needed as the data matched well to observed rainfall gauge data.

PA inquired as to our manual calibration approach. RB indicated that we started out with data sets from merged regional models in the area. Staff leveraged our previous experience on these other regional models and made parameter adjustments based on our knowledge of physiographic regions and associated hydrologic features such as the Green Swamp. JP added that we also used best professional judgement, our understanding of the geology, and made further adjustments based on head and flow targets. PA indicated he will review the model (GW Vistas) files to answer any additional questions he may have.

RB presented on the conceptualization of the aquifers and confining units in the area and the numerical implementation of that conceptualization via aquifer parameter arrays. RB discussed our plan to not use anisotropy as a calibration parameter, and instead fixed these values as 1:1 in aquifer and 10:1 in confining units. JP noted that we focused on horizontal hydraulic conductivity (K_h) for aquifer calibration and vertical hydraulic conductivity (K_v) for confining unit calibration. RB then presented the calibration statistics and noted he was very pleased with the outcome. PA inquired regarding our calibration targets and RB noted that we didn't have any specific targets for the steady-state calibration, and staff intends to refine the targets for the transient calibration. LM suggested that we add (1) plots of simulated vs. observed heads for each aquifer and simulated versus observed spring flows and baseflows and (2) histograms of residuals for groundwater levels, spring flows, and baseflows to improve our calibration justification and staff agreed to do so.

PA inquired regarding spring flow calibration and RB noted that reasonable conductance values were used. He noted that 90 percent of spring flows in the model are from magnitude 1 and 2 springs, which are outside CFWI area, but that model results are good.

Regarding baseflows, RB indicated that staff balanced the need to match estimated baseflow targets while minimizing flooding in Layer 1 in the southern part of SWFWMD. Basically, staff left some baseflow values high to minimize flooding in Layer 1. PA suggested having a more detailed explanation of our baseflow calibration rationale. RB noted the high degree of uncertainty of baseflow estimation as has been discussed at previous peer review meetings. MS suggested that staff explain how the drain totals were arrived at and aggregated within each basin. He again noted the challenges of baseflow estimation. RB noted that the baseflow estimation approach implemented for ECCTX has been reviewed and found to be on the low side of other estimates compared with a range of estimation techniques used with the North Florida Southeast Georgia Model. PA thought that drain values seem high, and RB

noted the highly discretized hydrography. RB agreed to post a map of the drainage network to the webboard for the Panel's information.

PA noted he was reasonably comfortable with the steady-state calibration. He noted that staff was very meticulous when accounting for recharge, pumping, and spring flows. Further documentation of baseflows would be appropriate. MS indicated he had a pretty good idea of staff's approach and what we achieved during steady-state calibration. LM reiterated his previous suggestions regarding developing simulated versus observed plots and histograms of residuals. He further suggested that the "wells" column on the water budget table be divided between pumping wells and drainage wells and staff agreed to do so.

Regarding baseflows, PA offered that staff might want to present a range of estimated baseflows at each gage as targets. PK emphasized staff's earlier comment that the model may not be in steady-state over the entire model domain (e.g., southwest portion where rainfall was higher) and that might limit staff's ability to match baseflows. UB noted that water budgets are handled better during transient calibration. Jeff Giddings (JG) suggested that structure flows (baseflow and runoff) should be used as targets during transient calibration. He also suggested removing baseflow targets from highly managed waterbodies from the baseflow target tables.

Regarding the proposed transient calibration approach, PK noted that staff plans on continuing the manual calibration approach, incorporating transient parameters, and using storage coefficient data from previous models as the starting point. PA inquired if staff intended to leave the steady-state aquifer parameters as fixed, but PK and RB indicated staff is open to altering these parameters within reason during transient calibration. LM suggested we compare the current steady-state calibration and our future transient calibration with that of previous models including ECFT-HAT and ECFT-USGS.

The Peer Review panel indicated they will take about two weeks to continue to review the GWVs file and PowerPoint information before summarizing their review in a one-page memo. PA asked if the Districts planned to develop a report on the SS calibration and PK indicated that today's PowerPoint presentation and supporting information is the proposed basis for the Panel to consider if they concur with staff moving forward with the transient calibration.

Public Comment

David Macintyre (DM) indicated that staff may want to examine how well they are matching total flow at the stream gages. If they are reasonably well at matching total flow, then it's simply the partitioning of what's baseflow versus runoff that is the issue where there is a great deal of uncertainty.

Adjourn

The meeting was adjourned at 4:00 pm.