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-- Peer Review --

Minimum Levels Determination: Prevatt Lake, Orange County, Florida

By

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Overall Impressions

The MFL document for Prevatt Lake, prepared by Chris Ware, is well written and develops the ecological criteria for MFLs at Prevatt Lake well. Descriptions of soils and plant-communities are thorough and understandable. The application of the SWIDS approach is well documented, and the discussion of MFL-development procedures using soils and plant communities are generally excellent.

I found no reasons for questioning the soils and plant community data and means for relating these to the stage-regime for MFL revisions.

The justification for revisiting the MFLs for Prevatt Lake are well presented and make it clear that the revisit is based on better methodology and data.

I do have concerns that some critical steps have been referenced when they should have been better developed in the report, however. These largely deal with modeling and data development issues. Also, there is a need to provide geologic and hydrologic context, as discussed below.

General Issues

It is my belief that a document, such as this MFL report, should stand alone to the extent possible. As a result, there are some content issues that should be addressed. These are listed below.

1. The report mentions CDM's 2002 hydrologic model many times. I'm not sure how this should be handled, but there is a need to develop the basis for the model and some of its results within this MFL document. Had the report been written by the District, it could be included as an Appendix. Perhaps this can still be done. If not, then the salient points of the model should be included in the District's words. The following should be included at a minimum:
 - a. The function of the model (is it a mass balance, water budget model or some other form?)

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- b. Calibration methods and evaluation (residuals analysis, etc.)
 - c. Results of the model, including water budget for the lake, modeled interactions with the surficial and Floridan aquifers; seepage components; evaporation, etc.
 - d. Evaluation of what the model tells you about the lake (sensitivity to a particular water budget component, function of a sandhill lake (why are water levels so “flashy” for example, etc.)
2. Price Robison’s Appendix (B) deals with stage duration curves and how they are constructed. It does not detail what is modeled or how the model was used. This is an excellent presentation, but does not suffice for the description of the CDM model.
3. The introductory remarks do mention that the lake is a sandhill lake, it is a sinkhole lake, it loses water to the Floridan, and other geologic/hydrologic details. However, there is a need to develop the geologic and hydrologic setting more and perhaps in a better organized fashion. For example, what is the extent of the lake drainage basin? What are the ages and geologic formations associated with the lake and its drainage basin? How is the lake connected to the Floridan or surficial aquifers? Presumably there are sinkholes in the bottom of the lake. What do we know about them? Is there a lake bathymetric map? What do we know about the physiography of the lake area?
4. On page vi, the Executive Summary states that the District considers the MFLs are protective of the lake under 2002 conditions. What is the basis for this?
5. On page 3, the report mentions “composed” rainfall and “estimated” Upper Floridan aquifer water levels. These terms are red flags. I gather from reading further that composed rainfall is extrapolated from nearby met. Stations and estimated aquifer levels are assumed to be represented by nearby monitoring well data. I would use a simple description of the data sources, rather than open the door to criticism, which is unwarranted, with the words composed and estimated. This is true where used later in the report, too.
6. Figure 5 suggests some issues with the HPSF-estimated lake levels. The observed lake levels do not seem to be fit adequately by the HPSF model. The fit improved after about 1980, apparently because the observed data density improved, but it is still not very good. As is the case with most such models, the HPSF model seems to estimate lake-level minima to be far below observed in many situations, and lake highs appear to be under estimated. This is critical because of you used of the HPSF data. The report should include an analysis of the residuals and explanation as to how the over- and under-estimations affect your analysis.
7. Also in Figure 5, there is a use of “Estimated” UFA level. I gather that this is a composite data set based on data from several wells. How were the data combined? Are the water levels weighted, what happened here?