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-- Peer Review --

Minimum Levels Determination: Sylvan Lake, Seminole County, Florida

By

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Overall Impressions

The MFL document for Sylvan Lake, prepared by G.B. Hall, is well written and develops the ecological criteria for MFLs at Sylvan 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. Use of the SWIDS method to establish the MFLs is entirely appropriate and defensible, in my opinion.

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

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 and an updated model many times. This is an important source of information about the lake, including water sources and sinks, land use issues, and other factors. I strongly suggest that the report(s) either include the model documentation as an Appendix or rephrase the report(s) with sufficient information that the reader can understand what was modeled, how the model(s) was constructed, and what the significant results of the model were.
2. The Appendix (B) deals with stage duration curves and how they are constructed. It does not detail what was modeled in the hydrological model or how the hydrologic model was used. Robison's text is excellent and very helpful for understanding how stage duration curves are constructed and used. The lay reader will greatly benefit from this appendix.

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3. I think it is important that the water budget be presented so we can evaluate the relative sources and sinks for water, especially with respect to recharge to underlying aquifer(s) and seepage as opposed to inflows. This could be part of the description of the hydrologic model.
4. There is a need to develop the geologic and hydrologic setting more. For example, what are the ages and geologic formations associated with the lake and its drainage basin? Is the lake connected to the Floridan or Intermediate aquifers? Are there sinkholes in the bottom of the lake? Have they been mapped (bathymetric map of the lake?)? Lake Watch has published bathymetric maps of many lakes in the District. Is one available to Sylvan? The section on lake morphometry mentions submerged ridges, etc. The bathymetric map would help understand the importance of these ridges (or are they what's left after the sinkholes in the lake formed?).
5. It would be helpful to include a drainage basin map in the first section. This could be on the location map or one of the others. Looking at the topographic map and other sources, it appears that the basin may be fairly complex.
6. I suggest that the Background Information be organized with a paragraph for each issue (physiographic province; aquifers, geology, sinkholes and karst, etc.). You talk about sinkholes, solution basins, sandhill karst, etc. These should be described (and defined).

The physiographic designations (Casselberry-Oveido-Chulota Hills and Central Lakes District) are from Brooks' (1982) physiographic map. Brooks' map is not widely accepted by the geological community and it is not widely available, so the terminology will be foreign to many. I suggest that also include the physiographic designations by White and Puri and Vernon, as well.

The citation of Boniol and others' recharge data is important, but there should be some discussion as to the role of the lake in this. I would guess that the average recharge is really largely focused in the lakes or other sinkhole areas. The water budget would help explain the importance of the recharge data.

7. The report mentions that the stage data for the lake had a period of record from 1978 to present. While these data appear to be more-or-less monthly, it would be helpful to include a period-of-record hydrograph or a hydrograph for a period of time sufficient to illustrate the temporal behavior of stage. How does the lake respond to rainfall?