SJRWMD Responses to Peer Reviewer and Stakeholder Comments Regarding Draft MFLs for Johns Lake, Orange and Lake Counties, Florida

Introduction

Independent scientific peer review was conducted for the draft Johns Lake MFLs report and appendices by Dr. Anthony Janicki, a Senior Principal Scientist with Environmental Science Associates (ESA) and Robert Burleson, a Senior Water Resources Engineer with Applied Technology Management (ATM), a Geosyntec Company. Peer review comments on environmental criteria, minimum levels, and hydrological data analyses were based on review of the following documents:

Blais, C. B., O. T. Leta, A. B. Sutherland, C.R. Shadik, S.L. Fox, and F. Gordu. 2025. Minimum Levels Determination for Johns Lake, Orange and Lake Counties, Florida. Draft Report. Bureau of Water Supply Planning, SJRWMD;

Appendix A: Topobathymetric DEM Development;

Appendix B: Hydrological Analyses;

Appendix C: Environmental Methods, Data, and Metrics;

Appendix D: MFLs Status Assessment; and

Appendix E: Water Resource Values (WRVs) Assessment.

This preliminary resolution document provides St. Johns River Water Management District (SJRWMD) responses to peer reviewer comments of primary concern. These comments and questions were submitted by the peer reviewers on May 27, 2025, as part of a teleconference presentation on their initial review findings. While the focus of this document is responses to initial review comments, all peer review and stakeholder comments will be addressed in the final resolution document.

Peer Reviewer Initial Comments / Recommendations, 5/27/2025:

Comment #1

Additional explanation needed related to the sudden change in simulated water levels around 1996 and prior as shown in Figure B-8.

Consider investigating the effect of the model over-prediction of Johns Lake water levels in the first half of the simulated time period on the environmental analysis.

SJRWMD Response:

As noted by the peer reviewers, the Johns Lake ICPR4 model overpredicts observed water levels during some periods, and especially from 1965-1990 (Figure 1). Despite the overprediction during that period, SJRWMD believes that the surface water model output is suitable for use in determining and assessing minimum levels at Johns Lake. This is because of the following:

1. The hydrological data used to determine and assess a given MFLs are meant to represent *future* conditions (climate and pumping influences), not the past;
2. Due to significant changes in the watershed (discussed below), the future condition of the lake is better represented by the model during the validation and calibration periods (post 1990) than the earlier part of the hydrological record;

The close relationship between simulated and observed water levels during the calibration and validation periods suggest that it is a suitable model for predicting the future state of the lake and watershed. It is worth noting that the Johns Lake surface water model was peer reviewed in 2022 and it was deemed appropriate for this MFLs (ATM 2022).

The following sections describe the reasons why the recent calibration period is a better predictor of the future state of Johns Lake. Further, the following information explains why the overprediction of the model during the period 1965 – 1990 is not a significant concern for determining the Johns Lake MFLs and freeboard.

1. Land Use / Land Cover Change

Johns Lake's watershed has changed significantly in recent years. Land use / land cover (LULC) was predominantly agricultural (primarily citrus groves) and natural until roughly 2002, but residential and commercial areas now comprise the vast majority of the watershed. Significant portions of the eastern half of the watershed were developed after 2002 and coincided with the construction of the beltway (SR 429) (Figures 2-8). This change in land use / land cover has come with a significant transformation from areas of high water infiltration to a large increase in impervious surface cover and directly connected imperviousness area (DCIA). One hypothesis for the lower lake levels in the early period (1965 – 1990) relative to more recent higher levels, is that the pre-development watershed likely contributed higher amounts of rainfall to the Surficial Aquifer (SA) and Upper Floridan Aquifer (UFA) because of low impervious surface cover and high infiltration. The post-development state likely restricts groundwater recharge and increases the amount of rainfall entering Johns Lake as run-off, increasing lake levels. This could partially explain the recent sustained high-water levels at Johns Lake for the POR, compared to the pre-development period. This was tested during the model development phase. Leta et al. (2022) state,

"We found that more than 30% of the watershed's cropland has been converted to developed areas (low, medium, and high residential and commercial/ industrial areas) during the period from 1973 to 2014 (Attachment C-5). To reflect this change and assess its implication on simulated stages of Johns Lake, we changed the current condition imperviousness fractions, crop coefficient (kc), and initial rainfall abstraction values of low, medium, and high residential and industrial/commercial areas to the corresponding cropland properties. Assuming the cropland in the 1970s represented "Groves" land use, which is also proposed by SLT (2021), we set the current condition imperviousness, kc, and initial rainfall abstraction values of residential and commercial/industrial areas to the values used for "Groves". This conversion reduced the overestimated simulated stages before 1993, but consistently lowered the simulated stages during the post-development period (Figure C – 21; this is Figure 9 in this response document)."

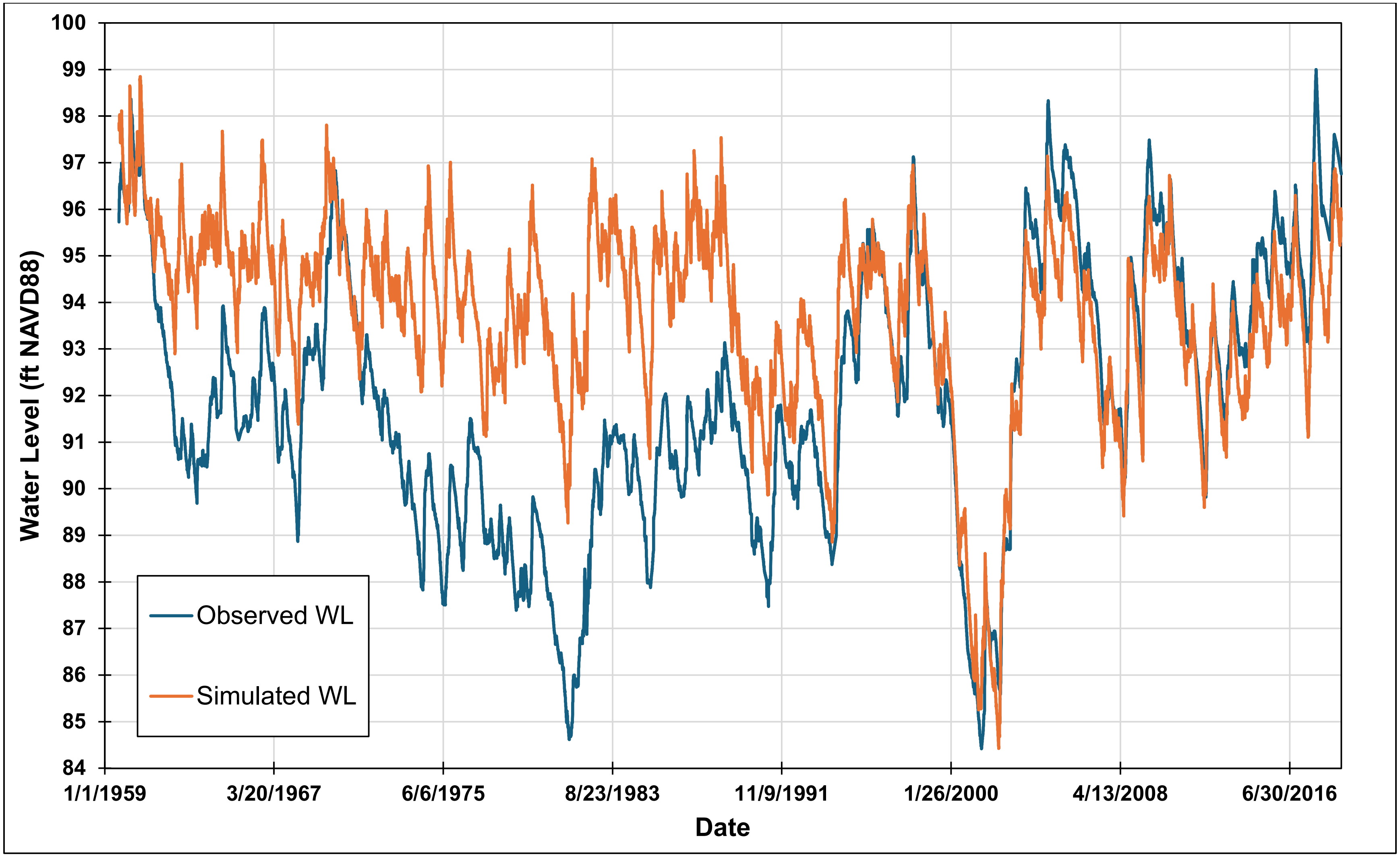

Figure 1: Observed and simulated water levels at Johns Lake from 9/7/1959 to 12/31/2018.

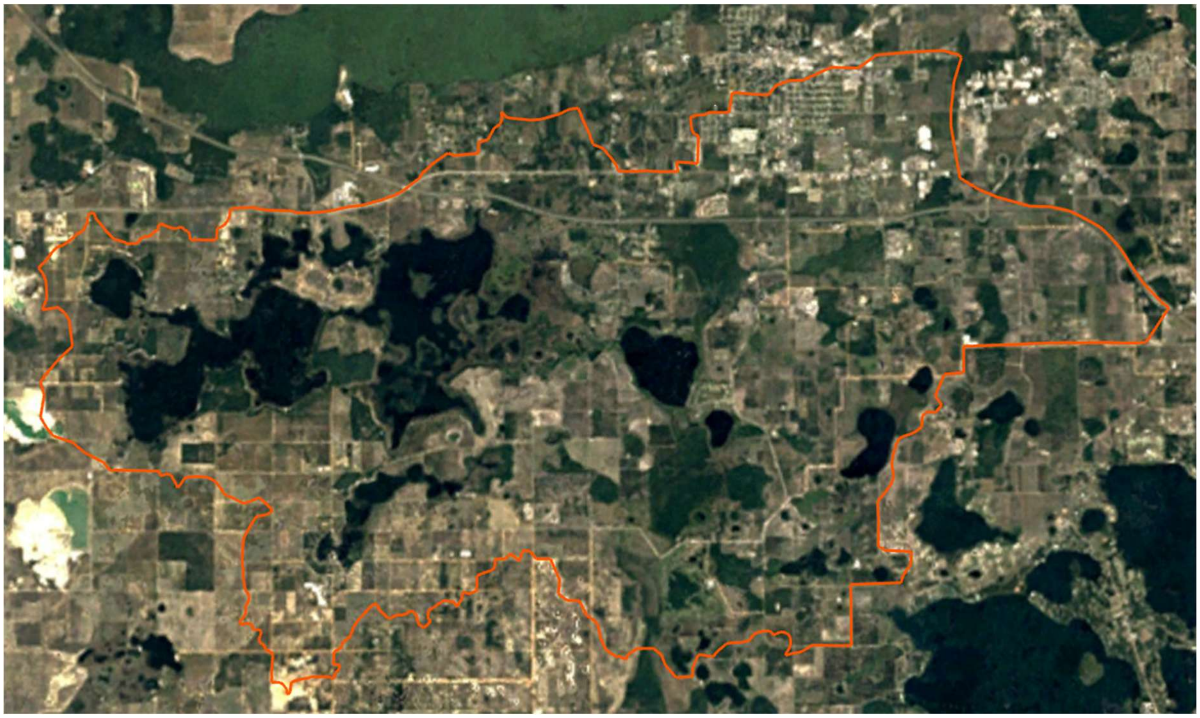

Figure 2: Johns Lake watershed on 12/30/1985.

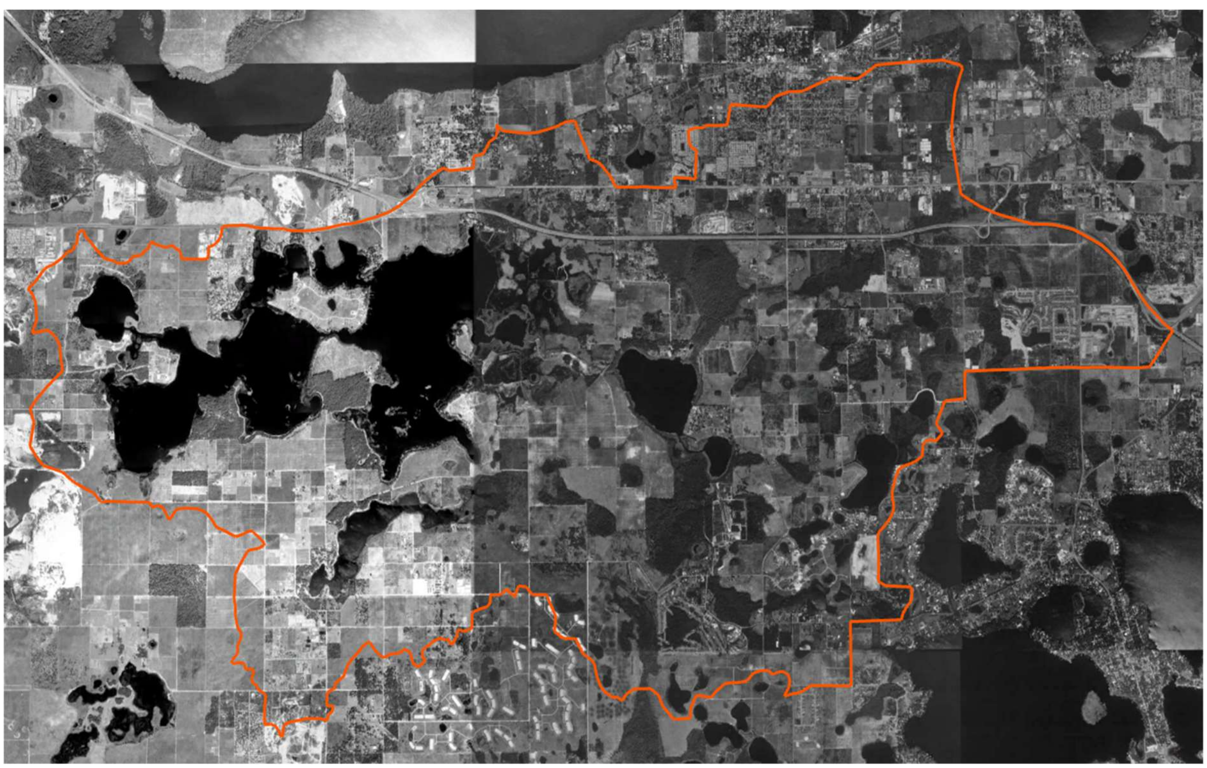

Figure 3: Johns Lake watershed on 2/4/1995.

Figure 4: Johns Lake watershed on 6/26/2003

Figure 5: Johns Lake watershed on 5//2010

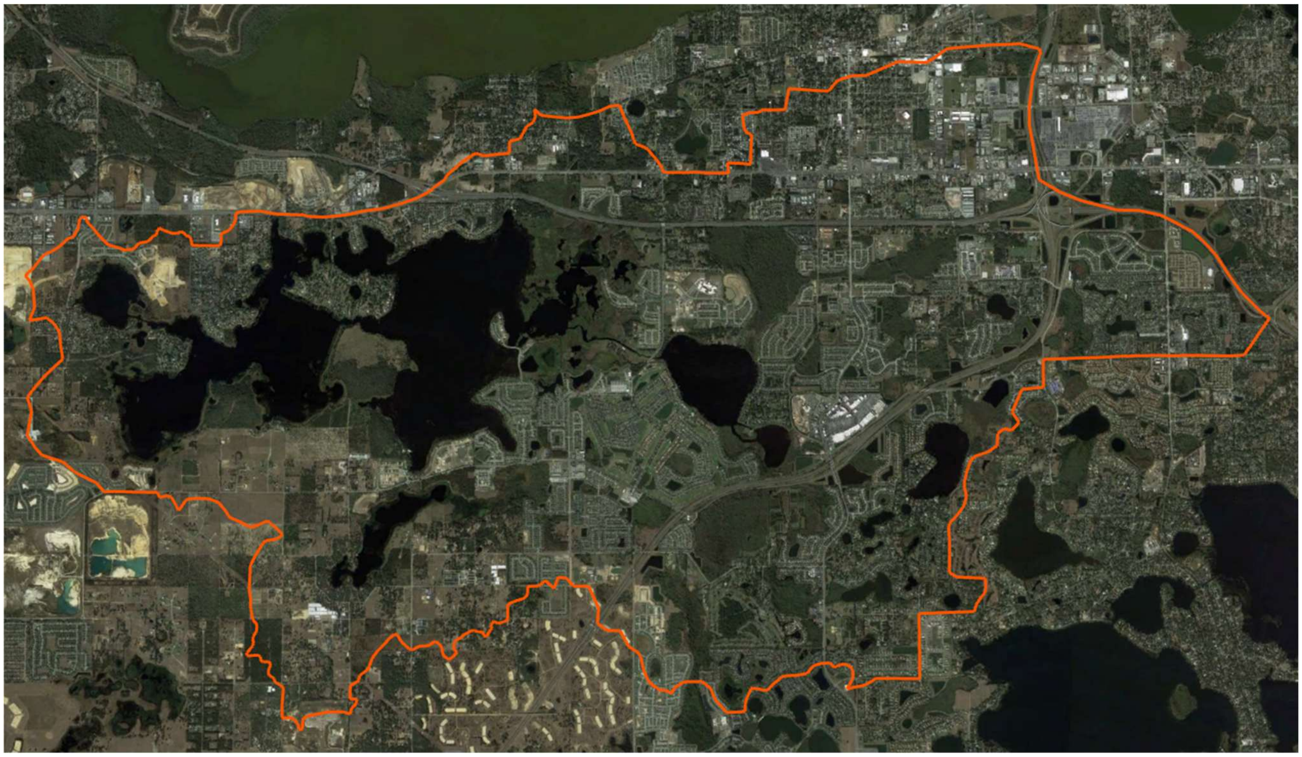

Figure 6: Johns Lake watershed on 1/3/2018

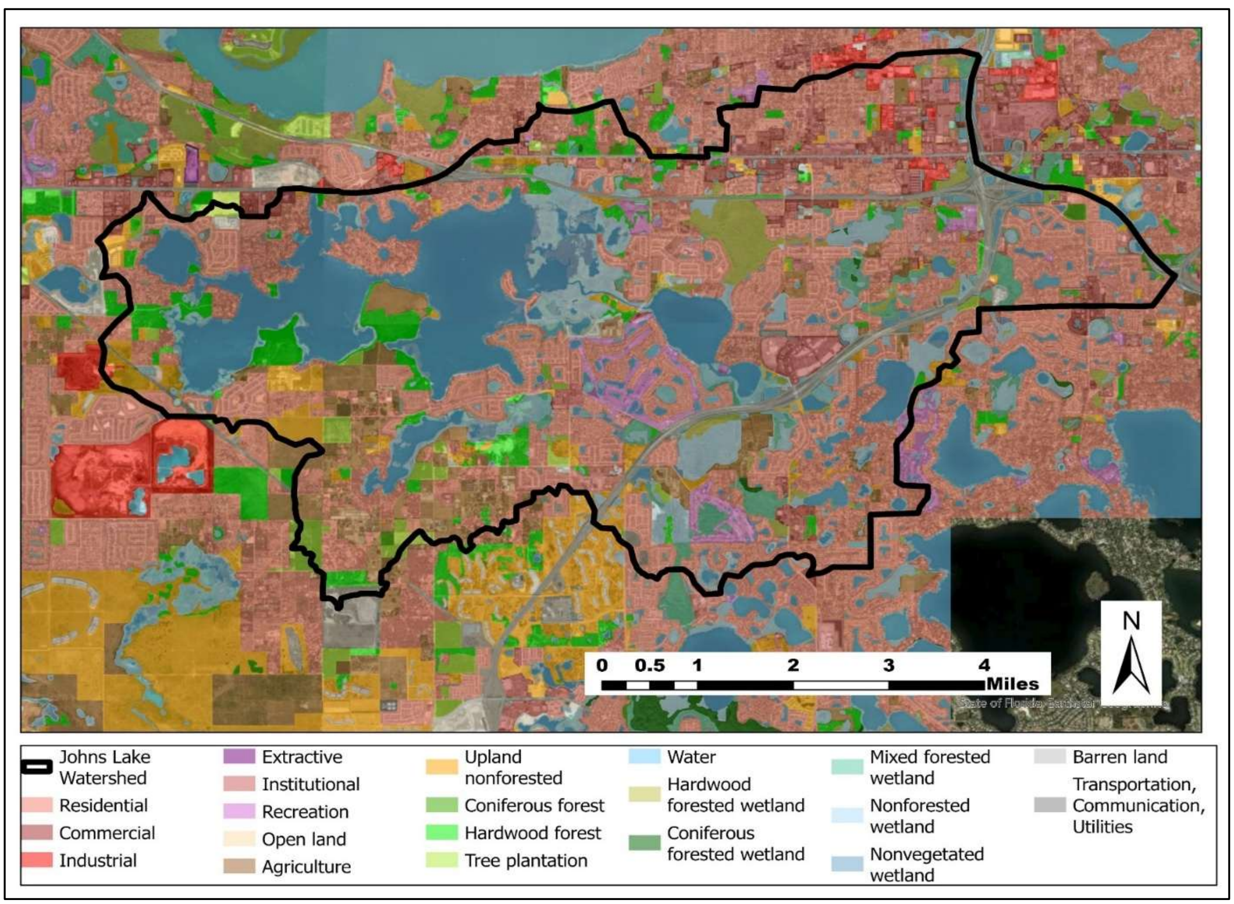

Figure 7: Land Use / Land Cover types in the Johns Lake watershed in 2020.

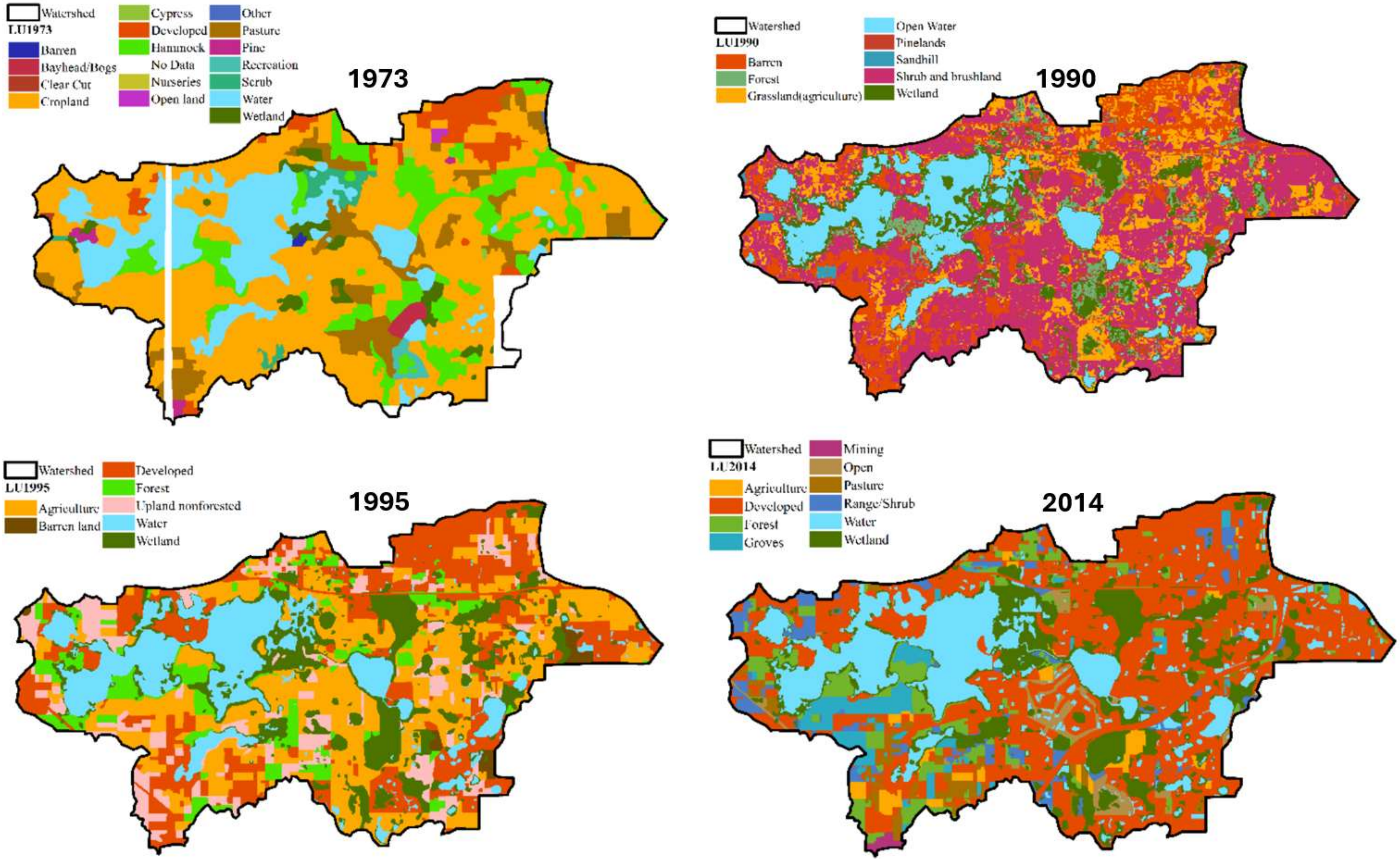

Figure 8: Land Use / Land Cover types in the Johns Lake watershed (1990, 1995, 1973, and 2014).

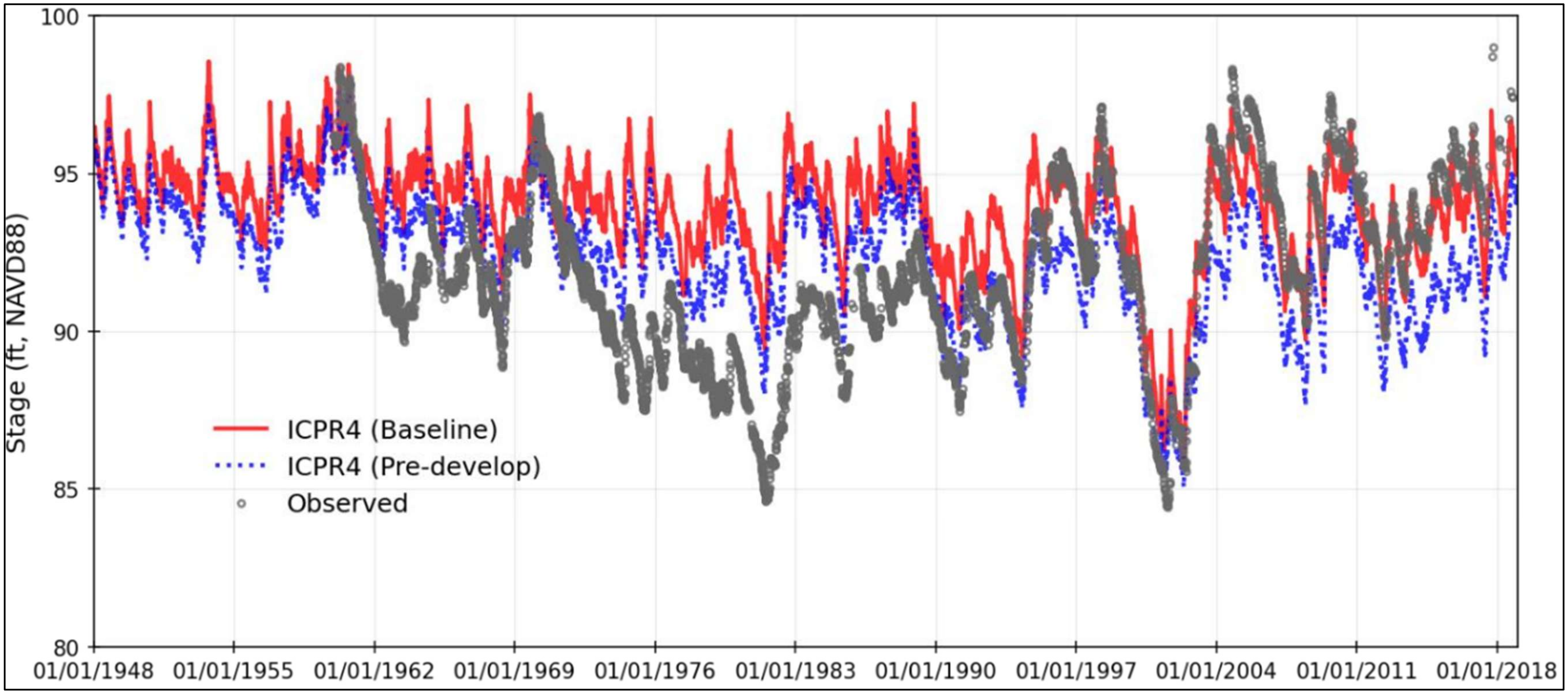

Figure 9: Adjustment to the ICPR4 model so that imperviousness, kc, and initial rainfall abstraction values of residential and commercial/industrial areas used the values for “Groves”.

Additionally, the LULC change and reduction in infiltration and recharge into the UFA would likely result in changes in the hydrologic dynamicity and the relationship between the lake and UFA systems over time. For example, Leta et al (2022) documented that the correclation between observed lake levels of Johns Lake and UFA levels had been significantly changed over the POR. These adjustments to the model did reduce the overprediction in the pre-development period, but led to consistent underprediction in the post-development period. Consequently, the comparison of the observed and simulated water levels for the pre-development period using the recent LULC data and calibrated model parameter values of the post-development period might not be appropriate.

Due to this fact, and as stated above, the post-development period is a better representation of the current and future state of the lake. Therefore, it was decided to not use the adjustments to the simulated long-term water levels of Johns Lake.

2. Rapid Infiltration Basins (RIBs)

Another change in recent decades that is not reflected in the POR from 1965 – 1990, is possibly the presence of rapid infiltration basins (RIBs) in the Johns Lake watershed. Johns Lake is close to and downslope of numerous RIBs, with some located within the watershed boundary (Figure 10). The Water Conserv II RIBs have been operational since 1987 and on average, have received increased water for treatment over time (Figure 11). The Water Conserv II RIB capacity increased dramatically throughout the 1990s and has been as high as 25 million gallons per day (mgd) in recent years (City of Orlando 2023). This input of water may partially explain recent high-water levels and the oversimulation of water levels before the 1990s.

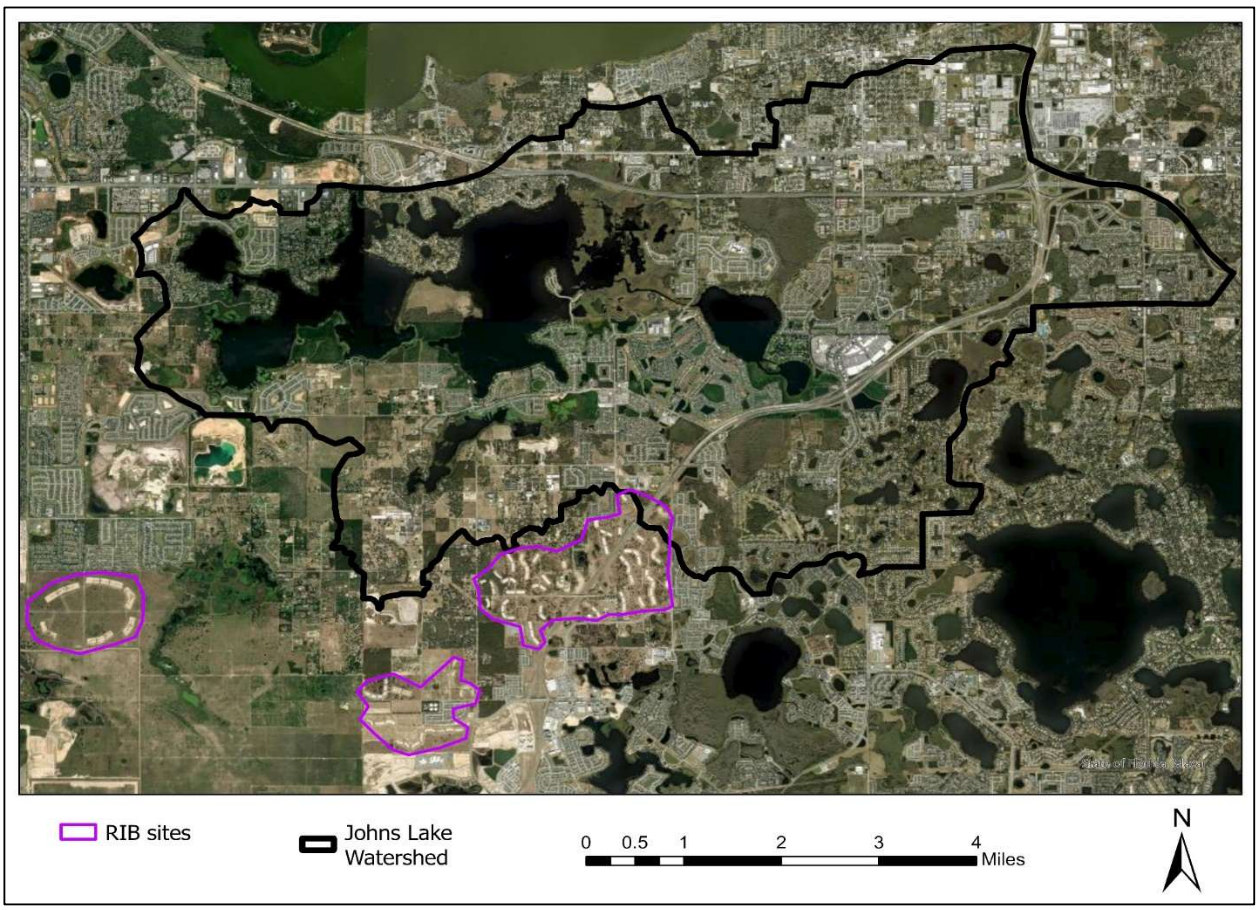

Figure 10: Water Conserv II RIBs and their proximity to the Johns Lake watershed.

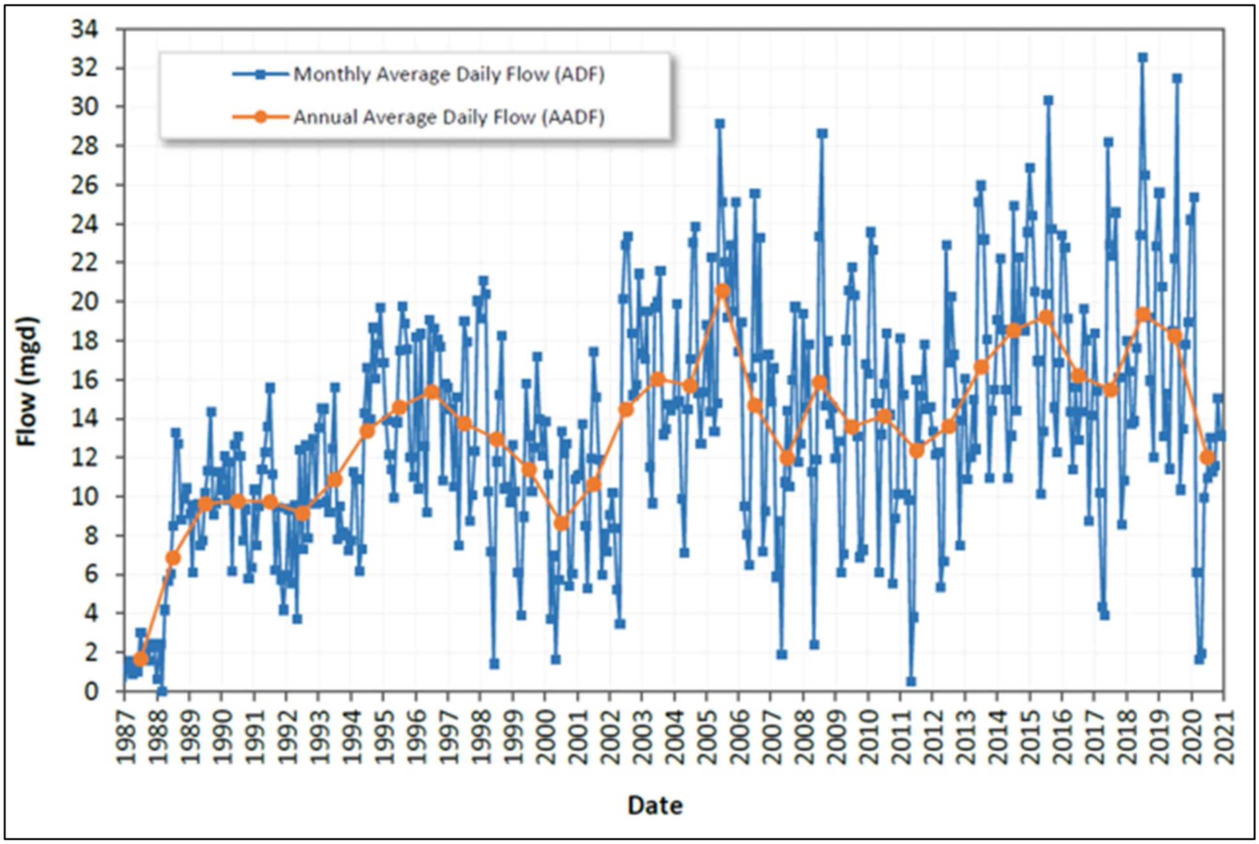

Figure 11: Historical flow to Water Conserv II RIBs

The exact impact of the RIBs on surface water levels at Johns Lake is unknown, but it is likely supplementing Johns Lake through increasing the nearby SA or UFA. The RIBs were receiving water during the validation and calibration periods of the model and may play a role in the overprediction in the pre-development period. The Water Conserv II project is planning to expand (Figure 12) and continue supplying the RIBs with reused water into the future. Although this may present a difficulty in modeling past water levels, it is possible that flow from the RIBs is having an impact on water levels at Johns Lake.

3. Changes to Motamassek Canal and the Outflow Sturcture

Motamassek Canal is the only surface water outflow from Johns Lake and was constructed sometime in the 1930’s (MSCW 2003). It flows from the northeast corner of Johns Lake into Lake Apopka (Figure 13; Figure 14).

The canal flows through ten parcels, eight of which are privately owned. Maintenance has been sporadic and largely undocumented. In the canal, the controlling elevation for the lake is a concrete weir just north of SR-50, which was rebuilt in 1993. The controlling elevation is listed as 94.5 feet NAVD88 by CWR (2019); this elevation is used in the model for post-1993 simulation period. This elevation was also confirmed by district staff (Figure 15).

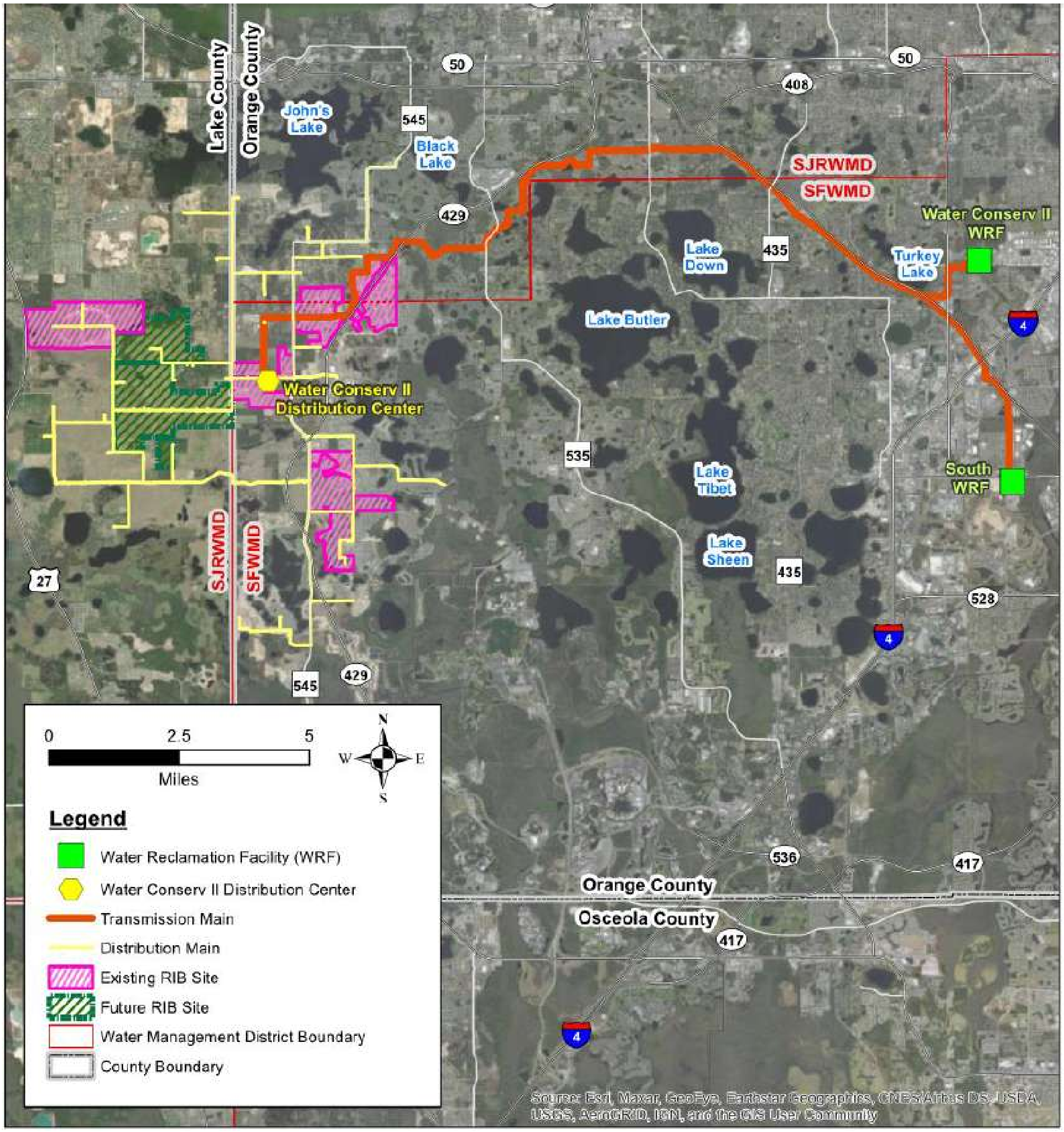

Figure 12: Existing and proposed future RIB sites in relation to Johns Lake

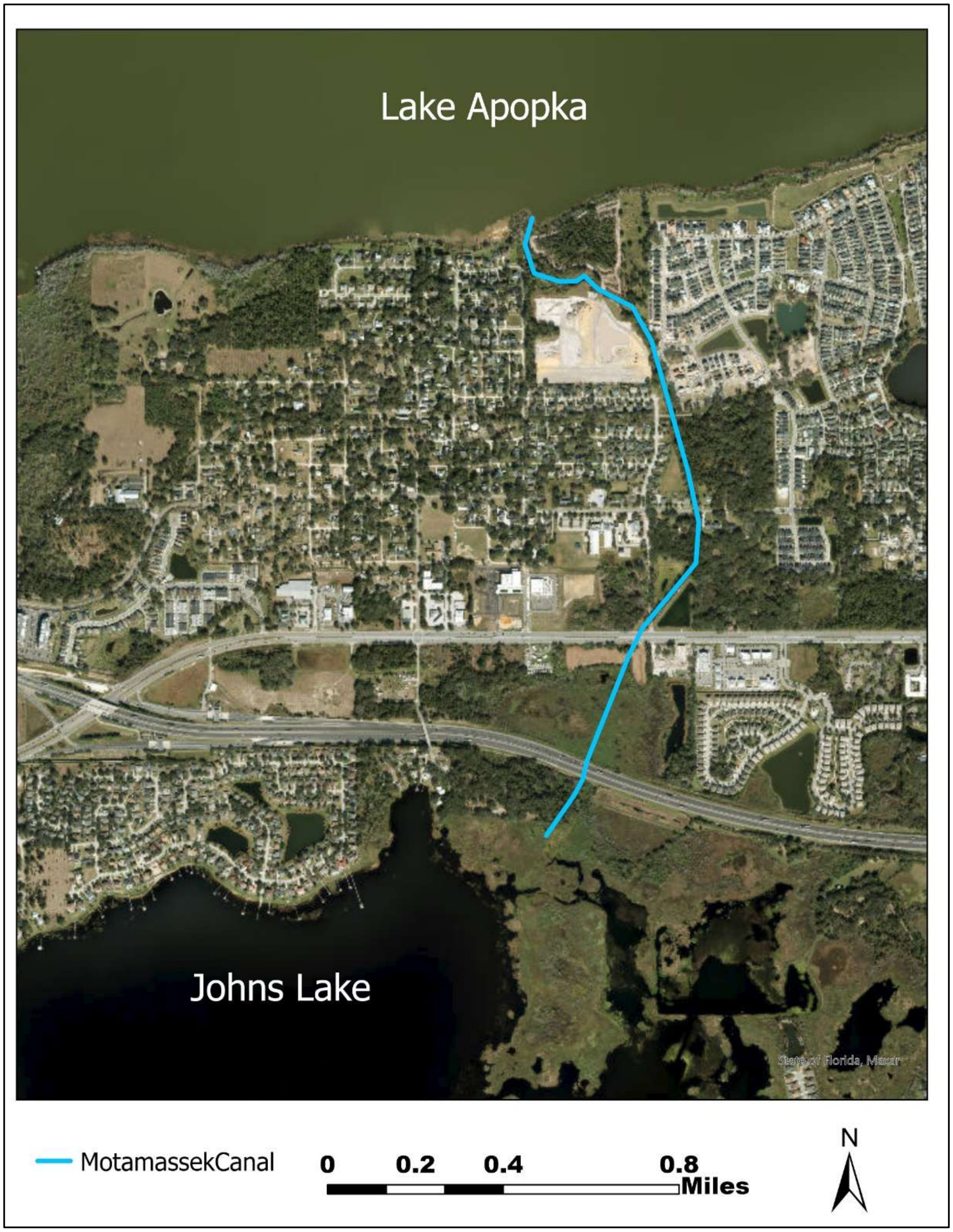

Figure 13: Motamassek Canal, which is the outflow path from Johns Lake into Lake Apopka

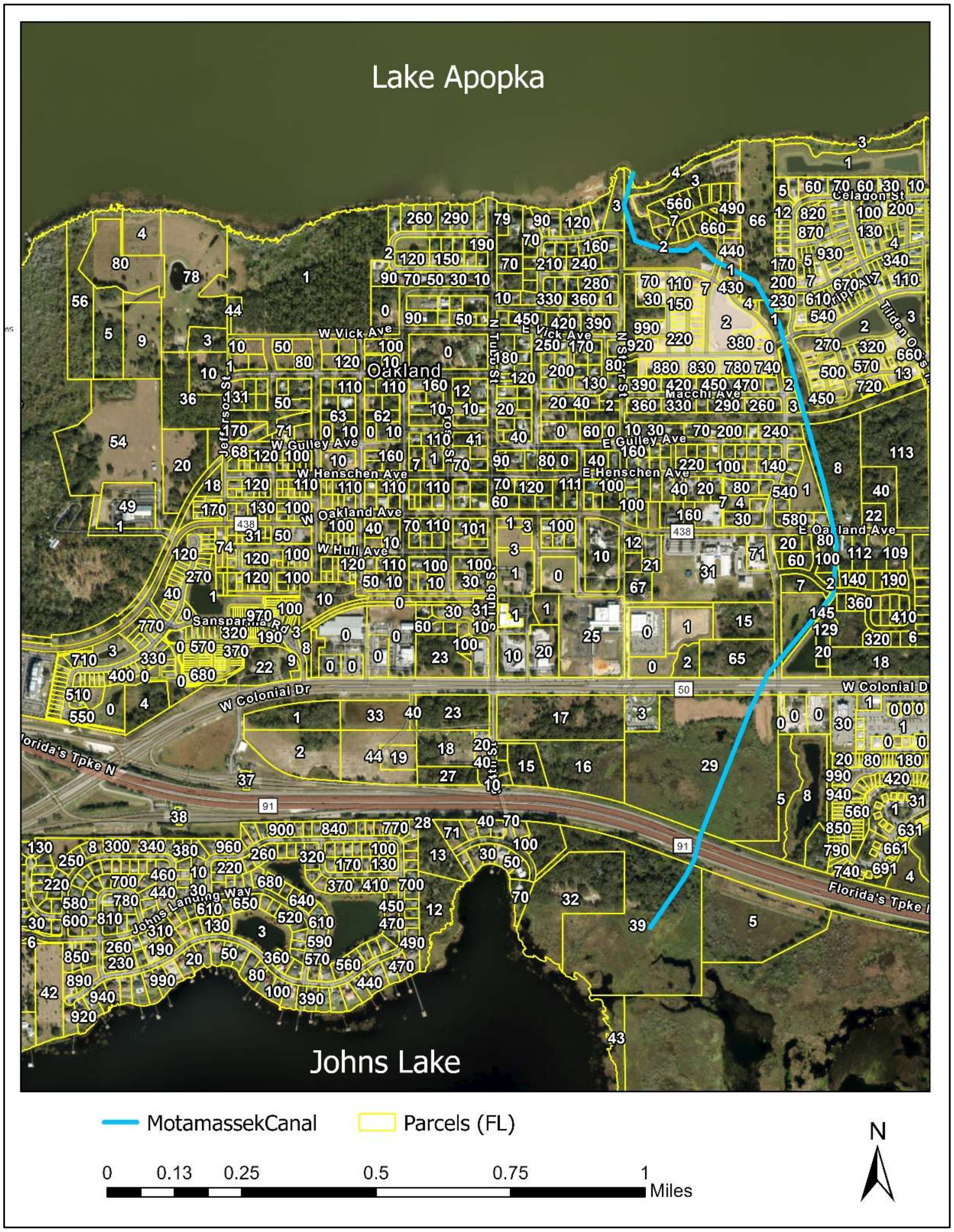

Figure 14: Motamassek Canal is split amongst ten parcels.

The exact elevation prior to the rebuild is unknown, but it was estimated to be 93.0 feet NAVD88 and used in the model for the pre-1993 simulation period. The increase in outfall elevation by a foot-and-a-half, is another possible explanation for the recent sustained observed higher water levels and relatively better model performance (Figure 16).

Figure 15: District staff confirmed the elevation of the control structure in Motamassek Canal.

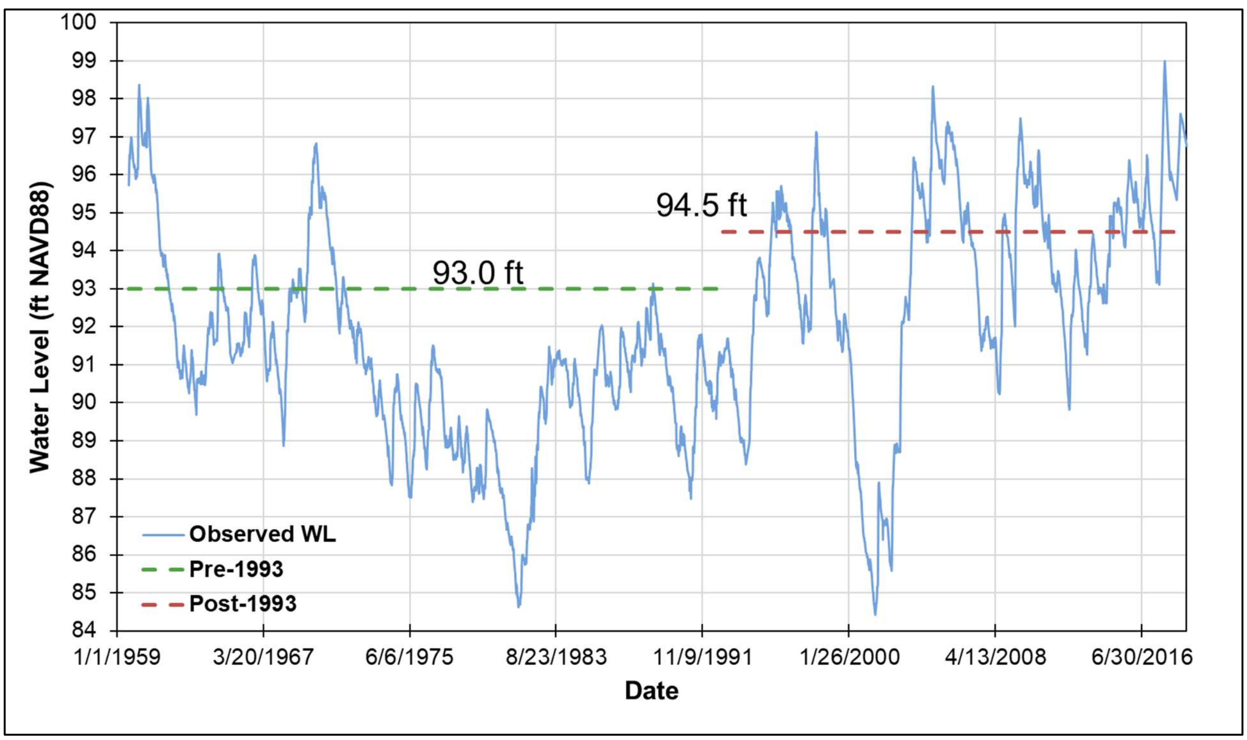

Figure 16: Controlling elevation of the outfall structure at Johns Lake, before and after 1993.

In summary, changes to the land use and land cover in the watershed, the impact of RIBs, and changes to the outflow canal and the structures that control the lake's water level all represent possible explanations for the model's overprediction. These recent and significant changes also explain why SJRWMD is recommending using the simulated data as the best predictor of future conditions in Johns Lake, despite the overprediction during the period 1965 – 1990.

While we understand the peer reviewers' concern with the model's overprediction of past water levels, we believe that the model's ability to forecast the future is more important for the evaluation of the recommended minimum levels.

Comment #2

Consider:

1. *Using the observed lake levels in the pre-development period to create a hybrid long-term lake level time series.*
2. *Apply no-pumping and current pumping adjustments to the hybrid time series.*
3. *Re-calculate statistics, including frequency statistics for duration, using the hybrid time series.*
4. *Re-evaluate No-pumping and current pumping frequency analysis for FH#1 and compare to MFL recurrence interval (1.6 years) determined from the SWIDS analysis.*
5. *Re-evaluate the open water area metric with the Hydroperiod Tool.*
6. *Re-determine available water for FH#1 and compare to open water metric freeboard (1.3ft) to determine if the open water metric is still the most constraining.*

SJRWMD Response:

To create the No- Pumping (NP) and Current Pumping (CP) conditions, a relationship between groundwater pumping and the UFA drawdown beneath the lake is developed using the ECFTX v2.0 model. In the MFLs analysis included in the report, this impact was applied to the ICPR4 simulated water-level time series (i.e., to create the simulated timeseries used for the MFLs assessment).

A "Delta-Observed NP" timeseries was created using pumping impact differences between the simulated NP condition and the simulated historical lake levels, and then adding this difference (or *delta*) to observed data. A Delta-Observed NP and Delta-Observed CP timeseries were created as follows:

1) A gap-filled observed lake level timeseries was created (observed data from SJRWMD gage 03840562 was filled using linear interpolation).

2) The ICPR4 model was used to create a simulated historical lake level timeseries.

3) The ICPR4 model was used to create a simulated NP condition lake level timeseries (using NP groundwater levels as model boundary condition).

4) The simulated historical levels were subtracted from the simulated NP levels to create the "NP delta".

5) The NP delta was added to the gap-filled observed lake level timeseries to create the "Delta-Observed NP" lake level timeseries.
6) The CP condition impact (i.e., same 2016-2020 impact used for the simulated CP timeseries) was subtracted from the Delta-Observed NP to create the Delta Observed CP lake level timeseries.

In addition to the NP and CP conditions, the same method was used to develop different drawdown scenarios. The MFL condition in the report (i.e., the most constraining condition) was based on CP plus an additional 1.3 feet of drawdown in the UFA. The difference from the CP and the CP-1.3 simulated conditions was subtracted from the Delta-Observed CP condition lake level timeseries to create the equivalent drawdown scenario (i.e., CP plus 1.3 ft of UFA drawdown) but with the observed data (Figure 17).

The three “delta timeseries” (i.e., Delta-Observed versions of the NP, CP and CP + 1.3 ft) were used to assess MFLs metrics using the same frequency analysis methods and criteria detailed in the report for Frequent High #1 (FH#1) (Figure 18; Table 1). With the Delta-Observed data, FH#1 did not meet the MFL, even under the NP condition. This would not have been considered a valid metric and would have been discarded if simulated data was not used. This result is due to the fact that recent higher water levels (ca. 1993-2023) have impacted the distribution of buttonbush at Johns Lake, increasing their average elevation. This is further evidence that the simulated data better reflects the current (and future) conditions and the hydroperiod required to protect the current distribution of plant communities at Johns Lake.

Due to the fact that the simulated data closely matched the observed water levels while the buttonbush community was establishing and the fact that those conditions are more likely to persist than the pre-development conditions, it is reasonable to use the simulated lake level data to assess FH#1.

The Delta-Observed data described above was also used to assess the most sensitive Hydroperiod Tool (HT) metric, the open water area ≥ 7 feet. The MFL condition (CP-1.3ft), on average, produced 19.1% less open water over time than the NP condition. This is above the impact threshold for this metric (a 15% reduction from the NP condition) but the larger *percent* change is due to a smaller NP condition area, not a greater total amount (i.e., acres) of change (Table 1).

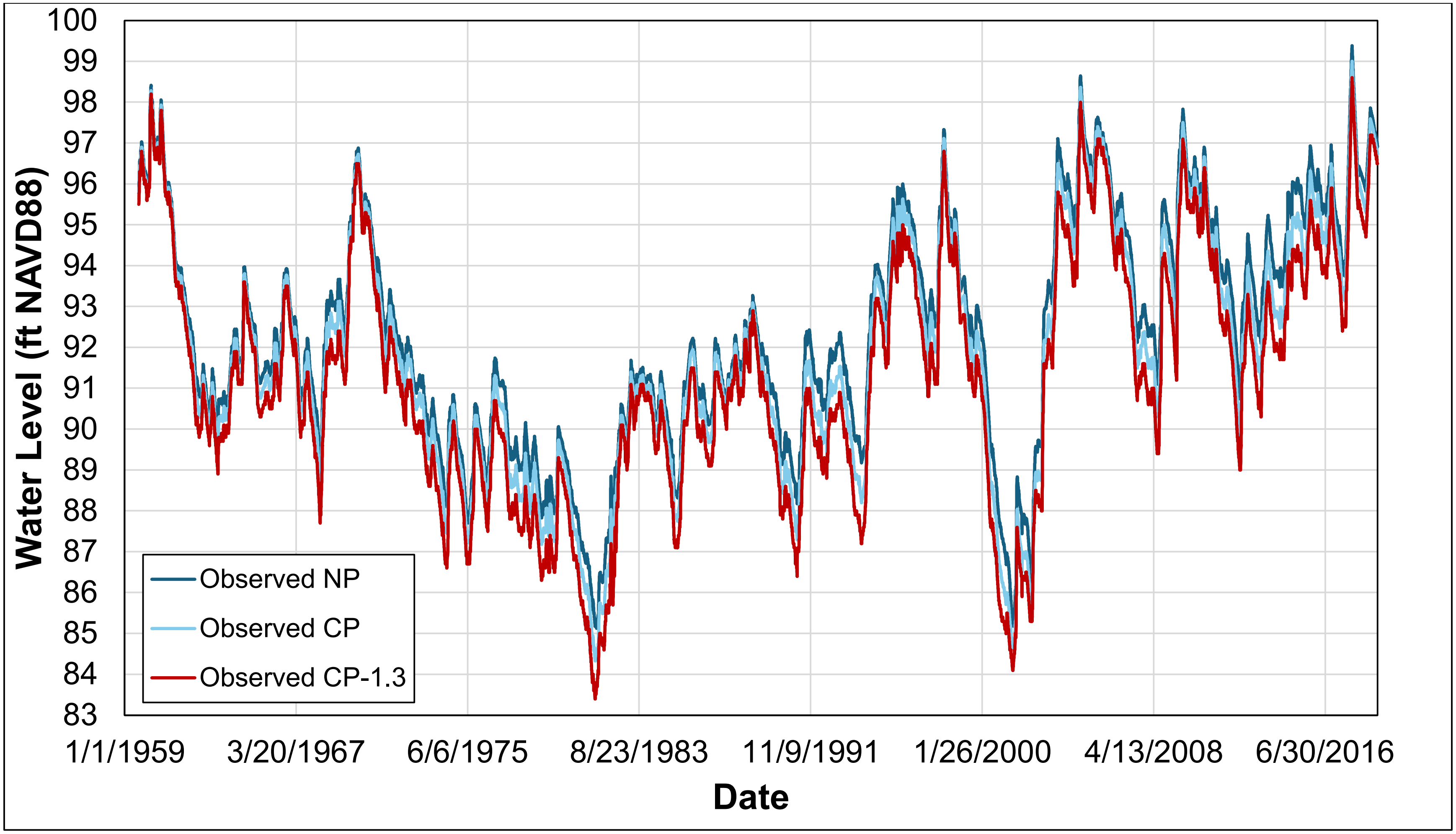

Figure 17: Three groundwater pumping scenarios, applied to gap-filled observed data for Johns Lake.

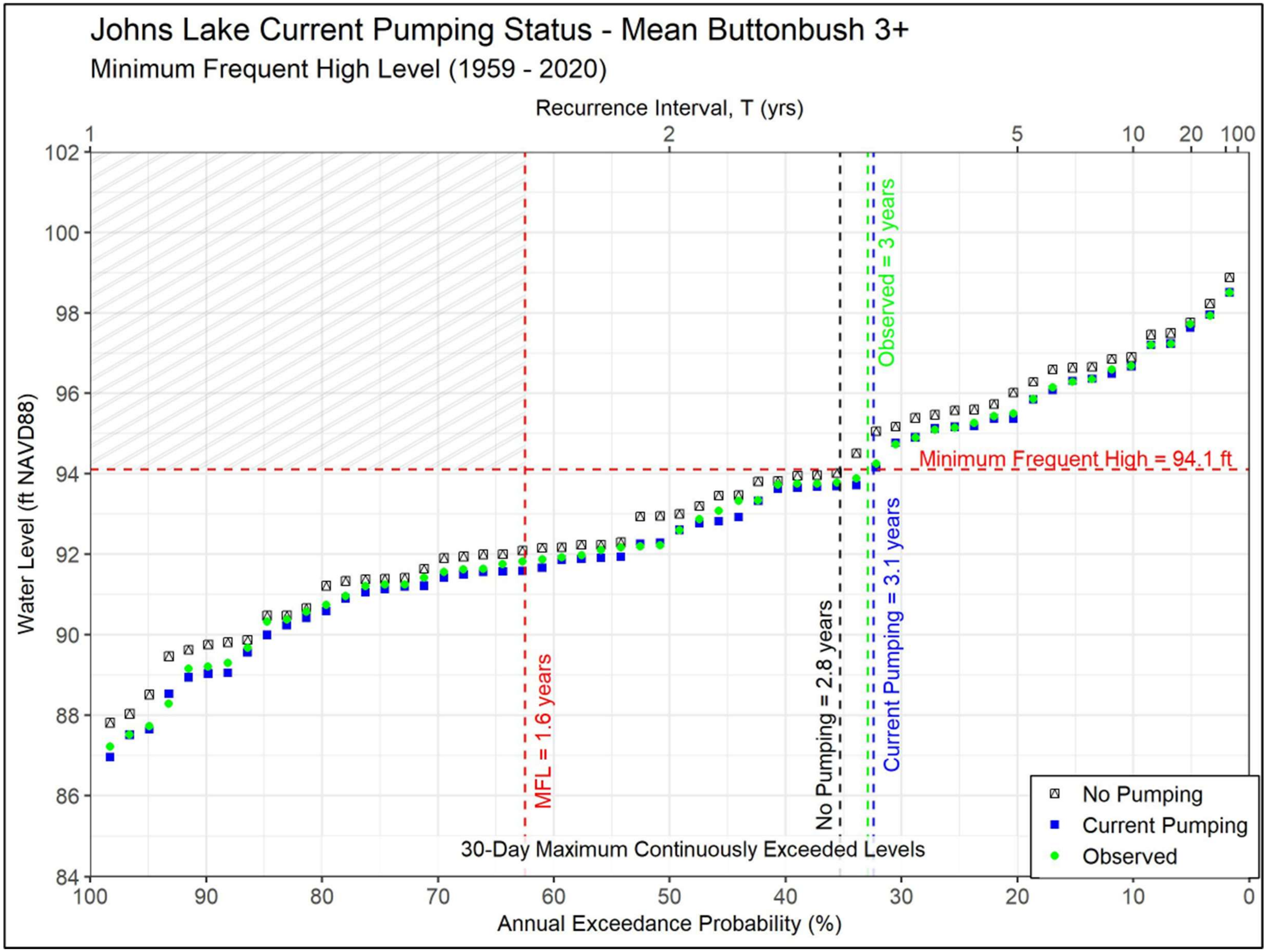

Figure 18: Weibull plot for FH#1 using the observed data and drawdown scenarios, instead of the simulated data.

Table 1: Simulated and observed data HT results for the open water metric

	Simulated Data	Delta-Observed Data
No-pumping (average acres)	1495.2	1022.6
CP -1.3 ft (average acres)	1275.4	827.6
Difference (NP - (CP-1.3ft))	219.8	195.0
Percent Change (%)	-14.7	-19.1

Comment #3

Need to discuss how you arrived at a 15-mile buffer zone when assessing groundwater pumping rate and UFA and Johns Lake drawdown impacts.

SJRWMD Response:

A technical memorandum was written by Hall et al. (2024) to explain why the 15-mile buffer was chosen. The 10, 15, and 20-mile buffers all had similarly strong relationships (i.e., high R^2 values) between pumping and impact (Figure 19), The 15-mile buffer was chosen because the Current Pumping (CP) impact from that regression was closest to the simulated ECFTXv2.0 result. Hall et al. state,

"To evaluate the performance of pumping-drawdown relationships for determining the most appropriate buffer to use for the final analysis, the impact from average 2016-2020 pumping in the model was calculated by inputting the average 2016-2020 pumping rate to each linear regression equation shown in Figures 4 through 6. The regression estimated impact was compared with the average 2016-2020 ECFTX v2.0 model simulated drawdown in the UFA beneath the lake. Table 1 includes the average 2016-2020 pumping rate and estimated impact from pumping drawdown relationships developed for each buffer area. At Johns Lake, the 15-mile buffer was deemed most appropriate for the final analysis due to its calculated regression CP impact being closest to the simulated ECFTX v2.0 impact."

Because the 15-mile buffer displayed a high R^2 value and closely simulated the ECFTXv2.0 impact, it was used to estimate the impact of groundwater pumping on the UFA near Johns Lake. It should also be noted that groundwater pumping across the whole

ECFTXv2.0 model domain is considered when assessing pumping impacts at Johns Lake. These details and clarifications will be added to the MFLs report.

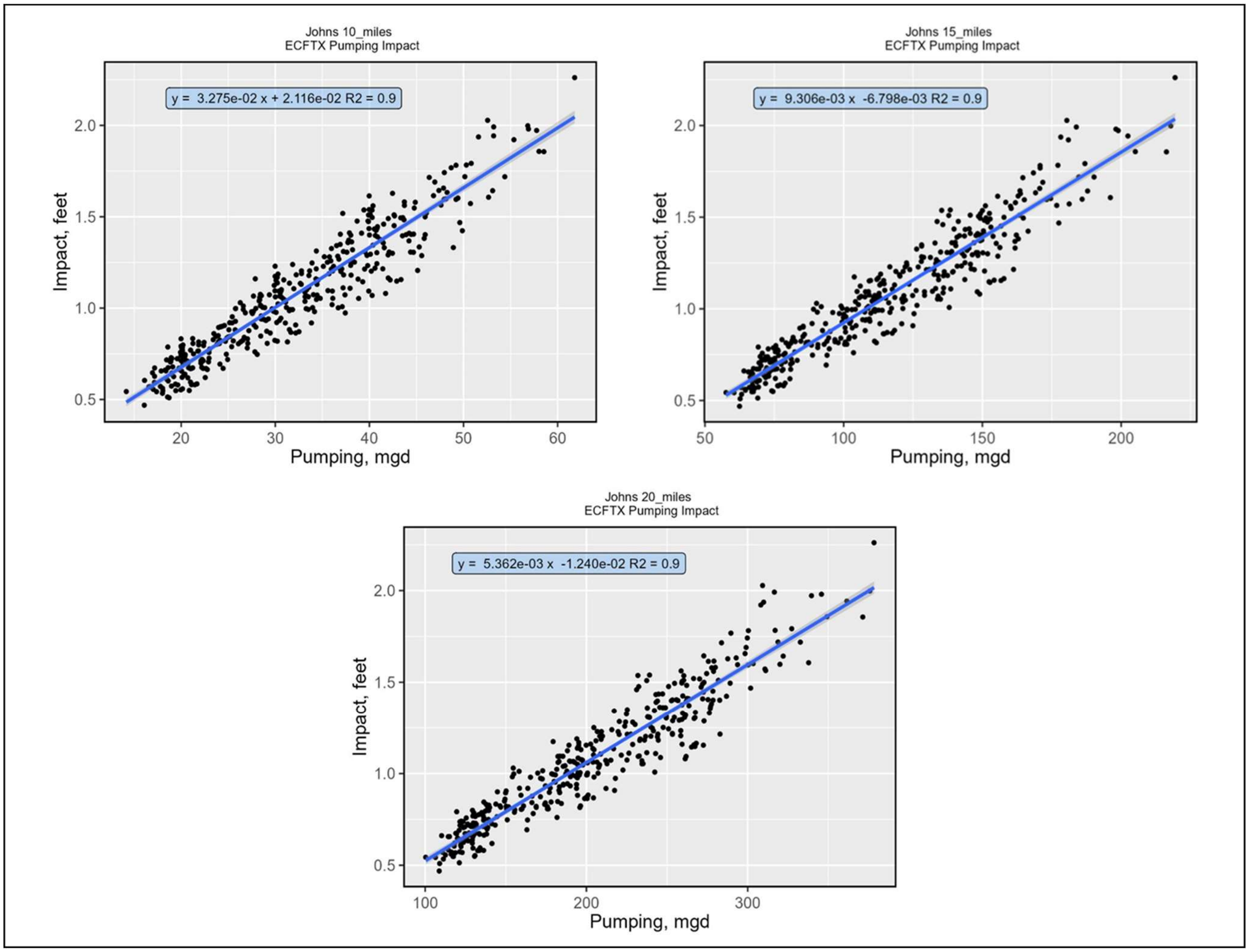

Figure 19: R^2 values for the relationship between pumping quantity (mgd) and impact (ft) on the UFA beneath Johns Lake using a 10, 15 and 20-mile buffer.

Peer Reviewer Comment from Final Technical Memorandum, 8/13/2025:

Comment #1

The biggest stated assumption is that the hydrological history will repeat itself (Page 28 of the draft MFL report). This needs clarification given the response to the peer review comments. Land use-land cover is not being repeated for the entire hydrological history. It is agreed that the model setup as reflected in the calibration and verification analysis is most appropriate for the MFL analysis. It should also be noted in the report as to why the final model setup following its peer review is appropriate, particularly as it relates to LULC. This would explain why even *though there is overprediction based on comparison to the earlier part of the hydrologic record, it is appropriate for the MFL analysis.*

Because of the rapid and significant changes that have occurred in the Johns Lake watershed (LULC, increased capacity at the CONSERV II RIBS, structural changes to lake hydraulic controls) in the more recent part of the hydrologic history, it may be more appropriate to say that climatic history is assumed to repeat (this is stated earlier on Page 28). This should be stated consistently throughout the draft report and the appendices. Given the uncertainties in future rainfall and temperature predictions, SJRWMD's approach of regularly testing this assumption by implementing an adaptive management strategy and periodic re-evaluations is considered reasonable.

SJRWMD Response:

Because the water levels at Johns Lake would be included under the term "hydrologic history", we agree with the peer reviewers that the claim that they will "repeat" may not be accurate. In the referenced section of the report, it has been clarified that while the *climatic* history is likely to repeat, the hydrology of the lake has been altered and the likelihood of the watershed returning to a "pre-development" state is low.

Orlando Utility Commission (OUC) Comments / Recommendations, 7/29/2025:

Comments and questions submitted by Greenman-Pederson, Inc. (GPI), on behalf of OUC.

SWIDS Related Comments:

1. *Appendix C, PDF Page 80 "Ward's method of hierarchical clustering" is used, but I didn't notice where the distance metric was specified. Presumably it was squared Euclidean distance which is typical for Ward's method (minimizing squared Euclidean distance to cluster centers), but it is worth mentioning since the distance metric often has as much influence on cluster outcomes as the agglomeration method.*

   SJRWMD Response:

   The distance metric used was the Euclidean distance between cluster centers. This has been clarified in the report.

2. *Appendix C, PDF Page 80, According to the Reference Manual for NBclust, it "provides 30 indices for determining the number of clusters". I would recommend removing any statements about "statistical significance" of clusters because by their nature unsupervised machine learning techniques are attempting to find patterns in the data and are therefore performing a kind of "data dredging" that doesn't lend itself to the concept of statistical significance. In other words, if the number of clusters is optimized in a process using all the data, it is likely that the differences among clusters is exaggerated to some extent based on the unique dataset at hand and therefore the use of term "significance" is not ideal. Note that this comment is not intended to invalidate the idea of clustering data to have a more*

appropriate SWIDS reference group which seems like a great idea and this method seems reasonable, I'm simply suggesting to avoid the term "significance" if possible.

SJRWMD Response:

We agree that the use of the term "statistical significance" is not an ideal term for describing our method of determining the number of clusters. All statements about "statistical significance" of clusters was removed from the report.

Grammar and Format Related Comments:

1. *In the main report, List of Tables, Table 3 has an "Error! Bookmark not defined" for the page number.*
2. *Main report Glossary and in Acronyms & Abbreviations the tilde over the n (enye) is missing on El Niño but it is included later in the report. Suggest adding the enye in these sections.*
3. *Main report Acronyms & Abbreviations section "NAVD 88" has a space, but in the text of the report and typically, it lacks the space "NAVD88".*
4. *Main report PDF Page 13, a period is needed after "(section 373.042, F.S.)" since the period after FS is inside the parentheses.*
5. *Main report PDF Page 13, "values described in thisby the rule include" suggest changing to "values described in the rule include".*
6. *Main report PDF Page 14, within the parenthetical "protect the critical environmentalvalues" needs space between "environmental" and "values".*
7. *Main report PDF Page 14, "Hydroperiod Tool Approach sectionbelow)" needs space between "section" and "below".*
8. *Main report PDF Page 14, the last paragraph beginning "If the status assessment…" appears to have two line returns before it instead of the expected one.*
9. *Main report PDF Page 16 "situated in the physiographic province known as The Gap is an area" suggest cutting run-on sentence to "situated in the physiographic province known as The Gap. The Gap is an area…"*
10. *Main report PDF Page 16, most references to "Central Lake District" are singular but there is at least one occurrence of "Central Lakes District". Suggest making them consistent.*
11. *Main report PDF Page 16, the paragraph spacing is wider within the Location and Physiographic Setting section than between sections.*
12. *Main report PDF Page 16 phrase "The Johns Lake" seems awkward and all other uses leave off the "The".*
13. *Main report PDF Page 21, the left tab is inconsistent between the first paragraph in the Hydrology section and later paragraphs. The line space or font size may also be different.*
14. *Main report Page 25, "the surface water model)" needs a period at end of sentence and the next paragraph is indented for an unknown reason.*

15. *Main report Page 27, a bookmark type issue: "(SJRWMD 2014; Error! Reference source not found. 10)".*
16. *Main report PDF Page 33, the "Partially Hydric" category colored brown doesn't appear to be present at all within the studied basin. Not necessarily an error, but perhaps double check and evaluate whether this is the best representation. (It may be present but too small to see.)*
17. *Main report PDF Page 34 "between May 1 and September 30th" consider adding "st" after "May 1" for consistent formatting.*
18. *Main report PDF Page 35 "This is based on the relationship" suggest clarifying by changing "This is" to "These rating categories are" which is what I think "This" refers to.*
19. *Main report PDF Page 38 "data from 1948 to 2020 were compiled or estimated at all stations within" is groundwater use occurring at "stations"? Perhaps "wells" or "locations" would work better.*
20. *Main report PDF Page 38 "use over the five-year period of 2016–2020 is approximately 156 mgd." Consider using "was" instead of "is".*
21. *Main report PDF Page 40 "are repeated over the next 73 years , the current-pumping conditionreflects the" has an unnecessary space before the comma and a missing space after "condition".*
22. *Main report PDF Page 40 "such as ENSO and AMO to rainfall, river flows and groundwater levels in Florida" suggest adding the serial comma after "flows" for consistency with style used in most of report.*
23. *Main report PDF Page 40 "Because of this, MFLs development requires", suggest avoiding starting sentences with the word "this" because of possible ambiguities. In this case suggest replacing text with "Because of these quasi-periodic climatic influences, MFLs development requires".*
24. *Main report PDF Page 40 the last paragraph starting with "SJRWMD acknowledges" appears to be a subtly different line spacing or possibly font size. In this paragraph there is an extra accidental period in this phrase "Moreover, . MFLs are established".*
25. *Main report PDF Page 43 suspect subtle change in line spacing in the "Event-Based Approach" section.*
26. *Main report PDF Page 46, Figure 18. The color chosen for the transects is difficult to see at this scale due to the overlay on imagery, suggest moving color closer to fuchsia. Although visible in Figures 19 and 20, color change for consistency if you decide to do it on Figure 18, would be appropriate.*
27. *Main report PDF Page 49 extra space after first paragraph on this page that ends with "two years" (Rule 40C-8.021, F.A.C.)."*
28. *Main report PDF Page 49 "generally establish in this zone,. However" has a comma before a period.*
29. *Main report PDF Page 51 "literature andconsultation with largemouth" needs a space before "consultation".*

30. *Main report PDF Page 51 "(National Research Council, 2012)" the comma is unnecessary in the citation and inconsistent with the citation format used in the rest of the report.*
31. *Main report PDF Page 51 "Lakes Geneva and Brooklyn (Sutherland et al., 2021) Lake Butler (Jennewein, et al 2020) Lake Apshawa (Sutherland et al, 2025) and Lake Prevatt (Shadik et al, in prep)." Suggest commas for the series of lakes presented.*
32. *Main report PDF Page 52 "ground water withdrawals); (5) summarization and statistical analysis for specific wetland types (using zonal statistics) or by grid cell (using cell statistics). (Fox et al, 2012; Kinser et al, 2012)." Consider adding an "and" before "(5)" as it is the last in the series of functions introduced. Also, the period is missing from "Fox et al" and the comma unnecessary. And, consider whether to drop the period after "statistics)" to not have the last two citations a stand-alone parenthetical. If you chose the stand-alone approach (not recommended) then the period should go inside the last parenthesis. Finally, this section and a previous paragraph appear to be indented.*
33. *Main report PDF Page 52 "Lake Butler (Jennewein, et al 2020) Lake Apshawa (Sutherland et al, 2025) and Lake Prevatt (Shadik et al, in prep)." Is missing some commas as mentioned in a previous occurrence of the same or similar text.*
34. *Main report PDF Page 54 "one or more wereparticularly sensitive" needs a space after "were".*
35. *Main report PDF Page 54 "0.5 ft), lLarge wading" looks like an extra small case letter "l" was inserted.*
36. *Main report PDF Page 59 "environmental criterion (Table 11)." The word "criterion" is a different font or typeface.*
37. *Main report PDF Page 60 "Small wading bird forage habitaters, large wading bird forage habitaters, sandhill crane nesting habitat," believe that "habitaters" should be "habitats".*
38. *Main report PDF Page 61 "but are projected not tobe achieved" suggest space between "to" and "be".*
39. *Main report PDF Page 62 "summarizes the WRVs) assessment" the lone parenthesis can be deleted.*
40. *Main report PDF Page 62 "was not assessedis because" needs to have the "is" deleted.*
41. *Main report PDF Page 63 "hydrologic regime thatwhich will" can delete the word "which".*
42. *Main report PDF Page 62 Table 14 is a very useful summary table!*
43. *Main report PDF Page 66 "Three minimum levels, a P25, P50 and P75, are" consider adding a comma after "P50" (depending on style in use for report). Same for phrase later in paragraph "low, average and high levels". It is unlikely the reader will mistakenly conclude that "average and high" levels are being lumped together in this case, but a serial comma is recommended.*
44. *Main report PDF Page 66 a paragraph line return needed after "relevant WRVs." And a possible line spacing issue exists as well as insufficient space after Table 15 before the text begins.*

45. *Main report PDF Page 70 there is an extra line return before the "Kirtman, B. P." reference. Similar extra spaces or other formatting issues are associated with the Nagid references and the National Research Council on PDF Page 71 and before Sutherland on PDF Page 72.*
46. *Appendix A represents a great (supporting reproducibility) summary of the steps used to produce the DEM.*
47. *Appendix A, PDF Page 7 "(Figure A-4) and lake edge contour lines (Figure A-2) it was" consider adding commas after "A-4)" and after "A-2)".*
48. *Appendix B, PDF Page 3 consider adding enye to any references to El Niño in this appendix.*
49. *Appendix B, PDF Page 5 "Figure B-3:" it seems references to figures in this appendix have a colon added to them in the text reference. I don't think that's consistent with the rest of the document.*
50. *Appendix B, PDF Page 5 "the highest and lowest rainfall amount recorded in 1953 and 2000, respectively" suggest "the highest and lowest rainfall amounts were recorded in 1953 and 2000, respectively."*
51. *Appendix B, PDF Page 5 "(Hargreaves and Samani, 1985)" an example citation style which includes comma which may be different than the style in main body of report. There are other occurrences in this appendix too like "(Helsel & Hirsch, 2002)" PDF Page 7.*
52. *Appendix B, PDF Page 5 "RET data is shown in Figure B-4: that indicates the lowest RET recorded in 2001 and the highest value in 2006." Suggest "…Figure B-4, that indicates the lowest RET was recorded in 2001 and the highest value was recorded in 2006."*
53. *Appendix B, PDF Page 7 "(Figure B-5:Table B-1: lists the" suggest using a semicolon rather than a colon to separate the name of the figure and the name of the table and no colon after name of table.*
54. *Appendix B, PDF Page 7 "middle of the watershed (see Figure B-3:that station did not have a long POR (only since 10/21/2010)." There's an open but no closing parenthesis in this sentence and the colon is an issue as noted previously.*
55. *Appendix B, PDF Page 7 "station 03840562 (Figure B-2as retrieved" should probably be "…(Figure B-2) as retrieved".*
56. *Appendix B, PDF Page 11 "as shown in Figure B-6:Table B-2:" confusing use of colons.*
57. *Appendix B, PDF Page 11 "The data was used" suggest "The data were used".*
58. *Appendix B, PDF Page 11 "levels data as boundary condition" suggest either "…as a boundary condition" or "…to define boundary conditions".*
59. *Appendix B, PDF Page 11 "03840562 (Figure B-2The daily long" there is a parenthesis, a spacing, and a period issue in the quoted text.*
60. *Appendix B, PDF Page 11 "levels of Johns Lake (Figure B-8: However, Figure B-8: indicates that" suggest the colon becomes a closing parenthesis and that sentence end with a period and "However" is start of a new sentence and delete the last colon too.*
61. *Appendix B, PDF Page 11 "This could be due to" suggest "This overestimation could be due to"*

62. Appendix B, PDF Page 12 Figure B-8, there is a fairly large and consistent offset between the modeled and actual lake levels occurring through much of the 1960s-1980s period. The report attributes this largely to unknown effects of land use changes and indicates it is not a concern since the comparison was good for the validation period which presumably reflects the more recent land use, which makes sense. Were there any other changes that may have resulted in the poor fit in the earlier period? I recall that the effects of Water Conserv II were brought up as a possibility in the peer review discussion. I'm not sure if you need anything else here, but if there are other possible factors you may want to list them.
63. Appendix B, PDF Page 12 "in which lake was not" suggest "in which the lake was not"
64. Appendix B, PDF Page 12 "in which lake was under" suggest "in which the lake was under"
65. Appendix B, PDF Page 12 "Figure B-9: shows" suggest deleting the colon.
66. Appendix B, PDF Page 13 "in Figure B-9:the" please note colon and spacing issues.
67. Appendix B, PDF Page 13 "gap filled UFA levels data from OR1123 well" you could hyphenate the compound adjective "gap-filled" and add "the" before "O1123 well"
68. Appendix B, PDF Page 13 "This data needs to be replaced" suggest "These data need to be replaced"
69. Appendix B, PDF Page 14 "Figure B-10:Details" suggest period and space instead of colon.
70. Appendix B, PDF Page 14 "Figure B-11:shows" suggest colon just becomes a space.
71. Appendix B, Figure B-11 legend "within 15-mile buffer" suggest "within a 15-mile buffer"
72. Appendix B, PDF Page 16 "Figure B-10: shows" suggest "Figure B-10 shows"
73. Appendix B, PDF Page 16 "groundwater use data was compiled" suggest "…data were…"
74. Appendix B, PDF Page 16 "groundwater pumping data was estimated" suggest "…data were…"
75. Appendix B, PDF Page 16 "The pumping data from 1995 to 2020 was available from the CFWI regional water supply plan . Data" suggest making data plural and eliminating the unnecessary space before the end-of-sentence period.
76. Appendix B, PDF Page 16 "water use data was aggregated" suggest "…data were…"
77. Appendix B, PDF Page 16 "estimates do not match, the published data of AWUS was used." Suggest "estimated did not match…"
78. Appendix B, PDF Page 17, "Census data was reported" suggest "…data were…"
79. Appendix B, PDF Page 17 "Figure B-12:shows" suggest the colon becomes a space in two occurrences on this page. A similar issue occurs with "Figure B-11:was"
80. Appendix B, PDF Page 17 "zone of Johns Lake (Figure B-12:. The" suggest colon becomes a closing parenthesis.
81. Appendix B, Figure B-13 legend "UFA levels within 15-mile of Johns" suggest "…within 15 miles of Johns"
82. Appendix B, PDF Page 18 "(Figure B-13:were" suggest colon becomes closing parenthesis and a space is added. Similarly, "Figure B-13:The" and "Figure B-14:" occur on this page.

83. *Appendix B, PDF Page 19 has four occurrence of unusual colon use related to figure or table numbers.*
84. *Appendix B, PDF Page 22 ".2022." in Gordu citation appears to have a misplaced period at beginning of "2022".*
85. *Appendix C, PDF Page 2 "factors considered in when selecting" suggest deleting word "when"*
86. *Appendix C, PDF Page 4 "10 ft (5ft on" not sure if the lack of space after "5" before "ft" is intentional.*
87. *Appendix C, PDF Page 5 paragraph beginning "The presence and depth" may have different line spacing than previous paragraphs*
88. *Appendix C, PDF Page 6 "10-16 inches (in.)" later this abbreviation is used without the period. Also "ft" without period is used throughout document, so probably best to drop the period here.*
89. *Appendix C, PDF Page 10 "final 4m" there's no space before the "m" as there are in some uses of the abbreviation. Later in the transect descriptions the space is gone, in some places so perhaps review document for consistency.*
90. *Appendix C, PDF Page 18 "was at 95.49 ft (ft)NAVD88," perhaps remove "(ft)"*
91. *Appendix C, PDF Page 22 "deep marsh (Deep Marsh (F)) which" contains an extra parenthesis*
92. *Appendix C, Figure C-7 the Salix Ecotone is missing its call-out box legend.*
93. *Appendix C, PDF Page 29 there's a noticeable thickening of the border on the "black nightshade" table cell.*
94. *Appendix C, PDF Page 33 figure caption for C-9 on following page*
95. *Appendix C, PDF Page 34 "(Fuirena scirpoidea). This zone had scattered blue maidencane, torpedo grass, and maidencane. Elliott's" includes a variety of font sizes. This same issue occurs on PDF Page 44 in the text "scattered; blue maidencane"*
96. *Appendix C, PDF Page 69 some font size issues possible in Table C-17 including "Redox concentration" cell and "Organic carbon less than" cell. Same issue on next page in cells mentioning "Muck Presence (A8),"*
97. *Appendix C, PDF Page 77 "water body (e.g. seepage from" consider a comma after "e.g."*
98. *Appendix C, PDF Page 78 "for MFLs events,However, often" suggest the comma becomes a period and add a space after it. Also, the word "it" is likely needed before "often"*
99. *Appendix C, PDF Page 78 "the MFL report-labelled community" consider the potentially more common American spelling of "labeled".*
100. *Appendix C, PDF Page 80 there is an extra line return after paragraph ending in "removed from the analysis."*
101. *Appendix C, PDF Page 85 "animal productivity, because . the floodplain provides" has an unnecessary period in the middle of it. On the same page "Johns LakeInundation of the" needs a space.*

102. Appendix C, PDF Page 86 "Return Interval" underlined needs a line return before it to become a sub-heading
103. Appendix C, PDF Page 86 the caption for Table C-24 got separated by a page break from its table.
104. Appendix C, PDF Page 87 this text in the table caption "return intervalRI plus" needs a change
105. Appendix C, PDF Page 90 there are two line returns after first paragraph.
106. Appendix C, PDF Page 92 just confirming the mention of Lake Prevatt is intentional in this text "since the start of data collection for Lake Prevatt in 2021,"
107. Appendix C, PDF Page 93 "affect Tthe areal extent" suggest deleting the capital T. The same error occurs on Page 95 with text "using Tthe hydroperiod tool"
108. Appendix C, PDF Page 93 one or both references to "Figure C-21" might better be referred to Figure C-20. Also, the Figure C-20 caption was kicked over to the next page.
109. Appendix C, PDF Page 96 line spacing change in paragraph beginning "Water depth is critical"
110. Appendix C, PDF Page 97 grate picture of the sandhill crane. Please remove s from the text "A sandhill cranes was observed"
111. Appendix C, PDF Page 101 "including mall wading bird forage habitat" please add an "s" to "mall"
112. Appendix E, PDF Page 3 two periods present after "tool metric).."
113. Appendix E, PDF Page 4 consider serial comma after WRV8 in "Group 1: WRV3, WRV8 and WRV10" heading
114. Appendix E, PDF Page 5 consider comma after "i.e." in "features (i.e. bed forms and the floodplain) and" also on this page an extra s occurs in "which s provide important refugia" and spelling issue with "twildlife" and error in this text in same paragraph "for providing hat provide"
115. Appendix E, PDF Page 6 "decomposing biota. . These" has an extra period. In same paragraph a period and space are needed in "Johns Lake systemA significant"
116. Appendix E, PDF Page 13 "the 15%. threshold and" has an unnecessary period.
117. Appendix E, PDF Page 25, caption for Figure E-15 broke onto next page.
118. Appendix E, PDF Page 26, extra period and space in "(Table E-8). . Lakes"
119. Appendix E, PDF Page 29, "this 5mg/L threshold" could have space after "5" to be consistent with most uses in report.
120. Appendix E, PDF Page 32, "until 2023.During this" a space after period is needed
121. Appendix E, PDF Page 31, text "analyzed. Also, the regression" contains different font sizes.

SJRWMD Response:

All grammar and format related comments were incorporated into the report, except for comment number 88 because the District abbreviates the word "inch" as "(in.)" to avoid confusion with the preposition "in".

Stakeholder Comments / Recommendations, 7/10/2025:

Comment #1 from Angel Martin

Some additional information is needed regarding the possible reasons for the oversimulation (simulated water levels higher than observed levels) in the early parts of the simulated period. Besides the change in land use and the development of Rapid Infiltration Basins (RIBS), suggest some discussion on the possible effect of varying rainfall data across the simulated period. The rainfall data during the earlier parts of the simulation probably may be lacking when compared to the later parts of the simulation. This point should be made clear in the report.

SJRWMD Response:

In the case of Johns Lake and most other systems for which MFLs are established, the hydrometeorological data from the past is less comprehensive than that of the present. In these instances, the District focuses on using the best available data to make assumptions about the past. This is a very critical issue for rainfall data, which is one of the main drivers in hydrological modeling.

In Appendix B, Leta explained the detailed process for estimating composite rainfall data from 1948 through 2020 that combines hourly data from Isle_Win station (1948-1994)_ and NEXRAD (1995-2020).

- The following paragraph outlines Leta's method for estimating rainfall (Appendix B, page 5):

"SJRWMD staff obtained hourly rainfall and daily RET from different sources. Figure 20 shows locations of the hydro-meteorological stations and Next Generation Weather Radar (NEXRAD) pixels, including their identification numbers (IDs). Hourly NEXRAD rainfall data were available from 1995 to the present from the SJRWMD hydrologic databases. In addition, gauged hourly rainfall data were available at the Isle Win station of SJRWMD from 1948 to the present. SJRWMD staff compiled the hourly rainfall data from the Isle Win station (1948-1994) with the NEXRAD data (1995-2020) to create composite rainfall data from 1948 to 2020 and to use in the ICPR4 model of Johns Lake (Figure 20). The composite annual rainfall values of the period from 1948 to 2020 are shown in Figure 21, which indicates the highest and lowest rainfall amounts recorded in 1953 and 2000, respectively."

In summary, rainfall data prior to 1995 were recorded at the Isle_Win gage, which is 5.76 miles away from the northern edge of the Johns Lake watershed. This station offers the best available data to estimate the rainfall values pre-1995 for Johns Lake. However, the uncertainty of the rainfall data should not be ruled out as the ICPR4 model directly used the rainfall values at the Isle_Win, but rainfall spatial variation is commonly observed over a short distance. Therefore, the direct use of rainfall data from Isle_Win for the pre-1995 probably introduced additional uncertainty to the long-term simulated water levels (pre-1995) of Johns Lake.

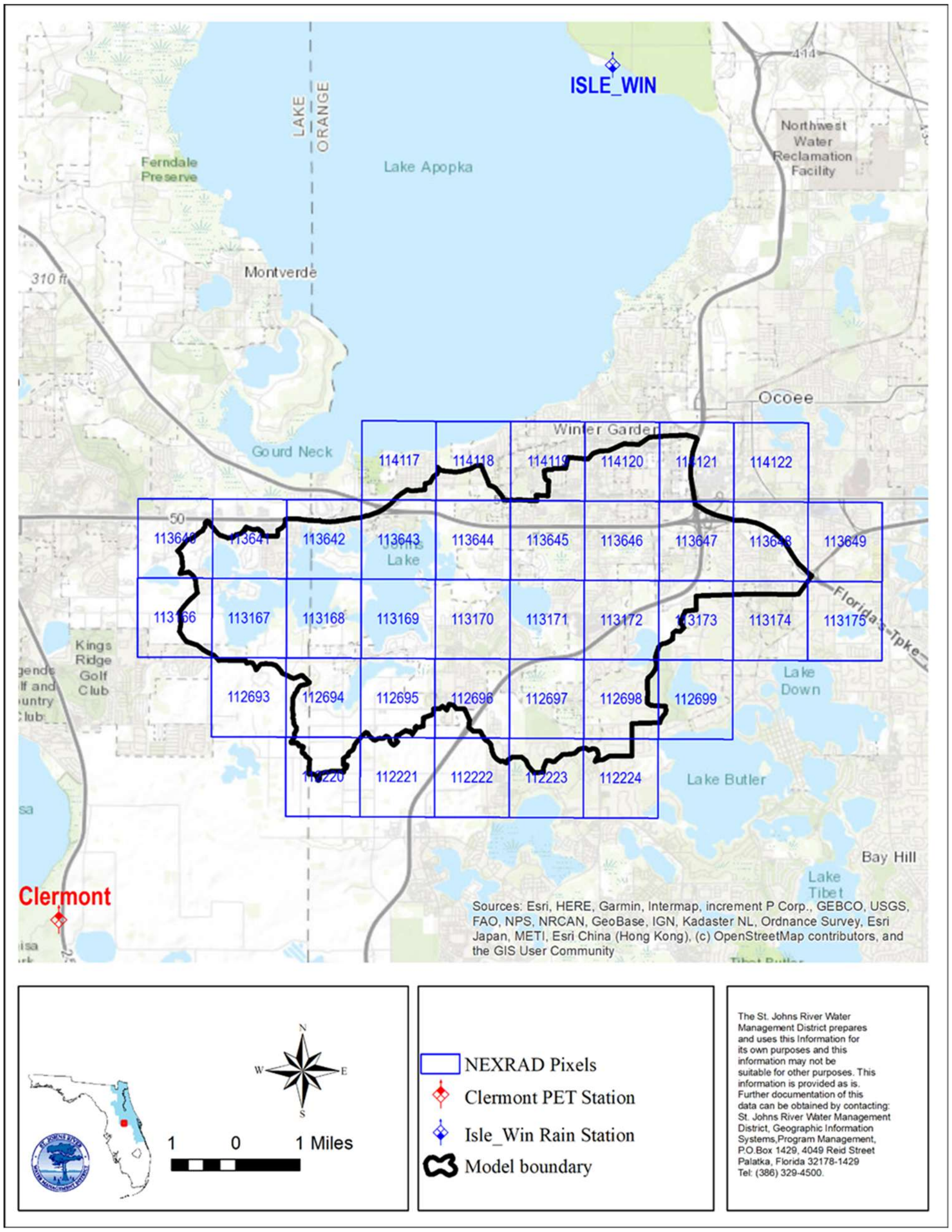

Figure 20: NEXRAD pixel identifications and hydro-meteorological stations of Johns Lake

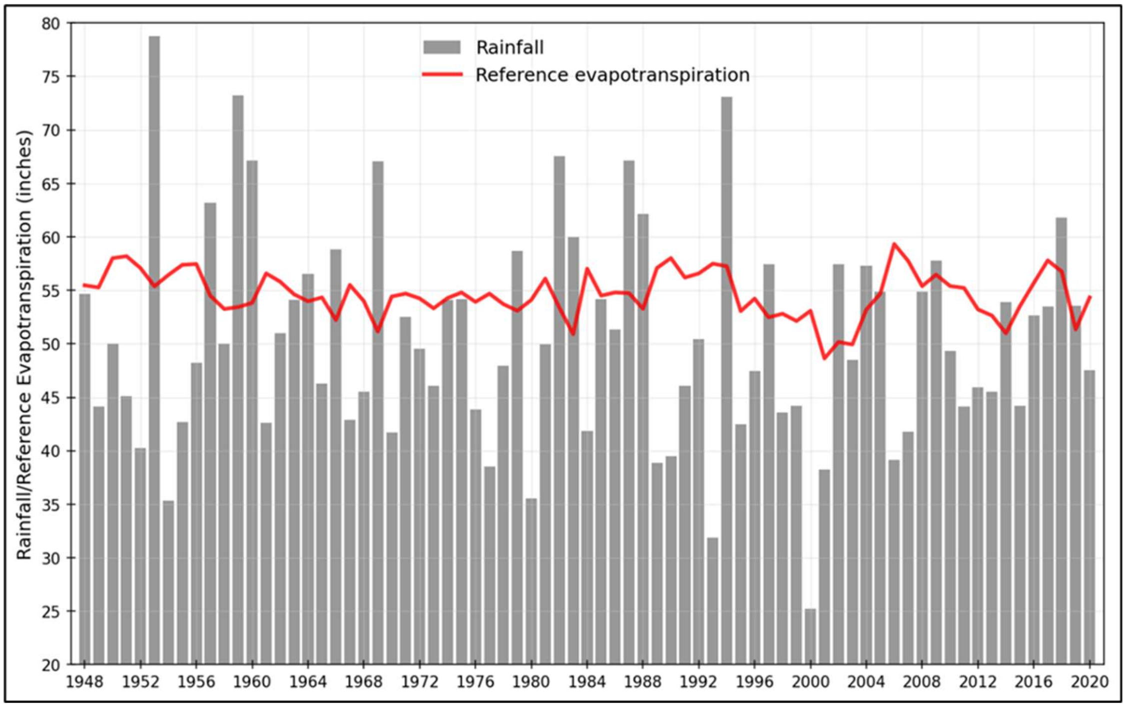

Figure 21: Composite annual rainfall and reference evapotranspiration (RET) values for Johns Lake

Comment #2 from Angel Martin

There should be some brief additional discussion in the report on what the term "predevelopment" represents. It is not entirely clear if predevelopment represents 1967 or 1973 or as far back as to the period of no development.

SJRWMD Response:

In this document, "pre-development" refers to the period before 1993, which is discussed in the final model report (Leta et al. 2022). It is noted that the time before 1993 was "a period when significant urbanization had not occurred" and this urbanization, along with gaps in rainfall and groundwater data, could contribute to the tendency of the model to overpredict past water levels (Leta et al. 2022).

Comment #3 from Angel Martin

In future MFL determination, suggest considering and discussing model limitations and uncertainty. There are limits on what these models can simulate and predict depending on various factors, including model scale, data availability, and other factors.

SJRWMD Response:

The availability of data and scale of the model do define a model's ability to simulate past conditions or project future conditions. The 2022 ATM peer review of the ICPR4 model for Johns Lake deemed that it was appropriate to use in simulating Johns Lake's water levels and that the best available data was used in its creation (ATM 2022) (see https://www.sjrwmd.com/minimumflowsandlevels/johns-lake/ for details). However, the ICPR4's greatest strength is in the detail that can be incorporated into the model, such as the availability, quality, and spatial coverage of hydrometeorological data (e.g., rainfall, groundwater levels, potential evapotranspiration, water withdrawals, etc) and representation of the physicality of the study area (e.g., storwater management systems, retention/detention ponds, lakes, water control structures, rapid infiltration basins (RIBs), etc). Lack of detailed data on hydrometeorological and representation of the physicality of the watershed system in the ICPR4 model may lead to uncertainty on the simulated water levels of Johns Lake. Consequently, regularly updating the model as detailed data and more information become available is highly recommended for future MFLs modeling and determinations.

References

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