Response to Public Comments

TMDL Responsiveness Summary for TMDLs Proposed November 2012

May 2013

Region 4

Atlanta, GA

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Numeric Nutrient Criteria Development

General response to comments regarding status of NNC in Florida:

Commenters on this TMDL and other proposed TMDLs addressing nutrients in Florida have raised questions about whether and how these TMDLs are impacted by ongoing activities to establish numeric nutrient criteria in Florida.

In 1979, FDEP adopted narrative criteria for nutrients applicable to waters designated as Class I (Potable Water Supply), Class II (Shellfish Propagation or Harvesting), and Class III (Recreation and for propagation and maintenance of a healthy, well-balanced population of fish and wildlife). See paragraphs 62-302.530(47)(a) and (b), F.A.C. FDEP recently adopted numeric nutrient criteria (NNC) for many Class I, II, and III waters in the state, including streams. See sections 62-302.531 and .532, F.A.C. The State's NNC numerically interpret part of the state narrative criteria for nutrients, at paragraph 62-302.530(47)(b), F.A.C., which provides that nutrients may not cause an imbalance of flora and fauna. FDEP submitted its NNC to EPA for review pursuant to section 303(c) of the CWA and on November 30, 2012, EPA approved those criteria as consistent with the requirements of the CWA. The state criteria, however, are not yet effective for state law purposes.

Also, in November 2010, EPA promulgated numeric nutrient criteria for Class III inland waters in Florida, including streams, pursuant to a Consent Decree in Florida Wildlife Federation, et. al. v. EPA, No. 4:08-cv-00324-RH-WCS (N.D. Fla.). On February 18, 2012, the streams criteria were remanded back to EPA by the District Court for further explanation. On November 30, 2012, EPA re-proposed its stream NNC for those flowing waters not covered by Florida's NNC rule. Those criteria have not been finalized.

Therefore, for streams in Florida, the applicable nutrient water quality standard for CWA purposes remains the narrative criteria. While FDEP's nutrient rule is not yet effective for state law purposes, EPA believes that FDEP's numeric nutrient criteria represent FDEP's most recent interpretation of paragraph 62-302.530(47)(b), F.A.C. Also, the other part of the state narrative criteria for nutrients, at paragraph 62-302.530(47)(a), F.A.C., remains applicable to all Class I, II, and III waters in Florida.[1] Paragraph 62-302.530(47)(a) requires nutrients to be limited as necessary to prevent violations of other Florida water quality standards.

In developing the TMDLs for the consent decree, EPA considered both paragraphs 62-302.530(47)(a) and (b). The nutrient end point for this TMDL represents the level of nutrients that will prevent nutrients from causing or contributing to nonattainment of the

[1] Paragraph 62-302.530(47)(a), F.A.C. will remain applicable to all Class I, II, and III waters even after FDEP's nutrient rule becomes effective. See subsection 62-302.531(1), F.A.C.

State's dissolved oxygen criteria pursuant to paragraph 62-302.530(47)(a). That endpoint, which requires that nutrients be reduced to natural background levels, was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

WBID: 1579 Bellows Lake Outlet

Endpoints/Water Quality Targets

Florida Department of Transportation

Comment:

3. At present, Florida is in the process of developing and approving revised DO criteria. While it is recognized that these criteria have not received final approval at this time, it is acknowledged by the Florida Department of Environmental Protection (FDEP) that the current DO standards are not appropriate, which led to the development of the new proposed DO criteria. Given this position regarding the DO standards, the determination that the system would not meet the DO criteria even under natural loadings may not reflect the "best science" as defined by EPA and FDEP and may be inappropriate for defining load reductions.

Response:

EPA does acknowledge that FDEP has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

Comment:

2. Section 4.2 outlines the Dissolved Oxygen Criteria. As EPA was willing to acknowledge the ERC approved Florida Nutrient Criteria, they should also acknowledge that Florida has ERC approved revisions to the DO criteria.

Response:

EPA does acknowledge that FDEP has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

Assessment

Florida Department of Transportation

Comment:

1. The data analysis presented for total nitrogen (TN) and total phosphorus (TP) indicates slightly elevated TN is present. The mean and geometric mean for TN were 1.76 mg/L and 1.71 mg/L, respectively. The mean and geometric mean for TP were 0.16 mg/L and 0.14 mg/L, respectively, with a maximum value of 0.42 mg/L. This compares to the

proposed inland numeric nutrient criteria (NNC) for west-central Florida of 1.65 mg/L for TN and 0.49 mg/L for TP. Based on this, the WBID is meeting criteria for TP and, therefore, would not be impaired for TP. The NNC considered a system's biological health in the development of the criteria for TN and TP. Given the nutrient levels in WBID 1579 and how they compare to the NNC values, the load reductions for TN, TP, and biochemical oxygen demand (BOD) of 75%, 93% and 66 percent, respectively, that are proposed in this TMDL do not appear reasonable.

Response:

The load reductions for WBID 1579 were set to protect DO in the Bellows Lake Outlet in accordance with the Natural Conditions water quality narrative. The TMDL reduced nutrients in accordance with the model outputs to increase DO in WBID 1579.

Comment:

1. The primary issue with this TMDL is that the Bellows Lake Outlet system is not represented correctly in the LSPC+ model. The two major water control structures in the outlet stream were not included. The effect of these structures on conveyance and water quality in Bellows Lake and the Bellows Lake Outlet is important and should not be left out of the model. The model as constructed is not correct and should not be used for TMDL determinations until the Bellows Lake Outlet system is represented properly in the model.

Response:

Bellows Lake was represented as a separate LSPC sub-watershed upstream of the lake outlet, which was represented as a separate LSPC sub-watershed. The LSPC model represented the simple dynamics of the flow pathway within WBID 1579. Data within the WBID was limited, and no data from the control structure of the Bellows Lake existed, therefore it was determined that using LSPC to represent loadings from surrounding watershed and the lake would adequately represent the concentrations. This method allowed for accurate representation of the water quality concentrations in the outlet, as shown in the calibration results in Section 7, where LSPC was able to correctly match the nutrient, DO, and BOD trends in the lake outlet.

Analytical Approach

Florida Department of Transportation

Comment:

2. The U.S. Environmental Protection Agency (EPA) prediction of "natural" condition loadings and in-stream nutrient concentrations is a critical aspect to this TMDL. More detailed assessment of the reasonableness of the "natural" conditions needs to be provided.

Response:

EPA relies on the natural condition scenario to determine if all applicable water quality standards can be met when there are no anthropogenic sources. EPA realizes to parameterize a watershed to a natural condition requires some assumptions. EPA Region 4 has been using this methodology to develop nutrient TMDLs for over 8 years. While the methodology is not perfect, it does use best available information and technical approach to determine whether a particular water quality standard could ever be met. This methodology has been improved through the years based upon feedback from stakeholders and FDEP. Florida regulations will not allow the abatement of a natural condition; this determination is needed to determine the maximum load reduction that would have to occur without reducing to below natural conditions.

Comment:

6. The report does not address what model parameter changes were made in constructing the natural conditions model beyond the adjustment to land use. For example, were any adjustments made to benthic oxygen demand in the natural conditions model to reflect a lower loading condition? The report needs to provide a complete and comprehensive presentation of what went into the development of the current and natural conditions models, including all physical, hydrologic, and chemical inputs and all relevant model coefficients.

Response:

No model parameter changes were made in the natural condition scenario of the model. EPA believes that the TMDLwas sufficient to describe the TMDL analysis. The complete list of physical, hydrologic, and chemical inputs and all relevant model coefficients is too lengthy to include in the report. The administrative record for this TMDL contains all of the models and their associated input files. This information is available to the public upon request and may be reviewed at any time.

Comment:

7. The natural conditions model input file was not provided. This should be provided so that an assessment of its construction can be made.

Response:

No model parameter changes were made in the natural condition scenario of the model. The natural condition model converted anthropogenic land uses to forested and wetland land uses using the ratio previously presented.

Watershed Model

Florida Department of Transportation

Comment:

3. Bellows Lake Outfall (Stream), starts at the outlet from Bellows Lake and flows under Interstate 4, through box culverts to the southeast. Downstream of the I-4 crossing are two weirs that control the water level in Bellows Lake and discharge to a large ditch that conveys water towards Orient Road. After passing Orient Road, the flow is joined by the discharge from the Fairgrounds Outfall South System. Flow continues, generally southeast to just past Martin Luther King Boulevard. At this point, the stream channel becomes deep, with steep side slopes and with little to no stormwater management systems in place. There is a control structure at the final discharge location into the Tampa Bypass Canal.

Neither of these two control structures is represented in the LSPC+ model. Review of the LSPC+ input data set indicates the hydraulics of the stream are represented as simple open-channel flow. The effect of these structures on conveyance and water quality in Bellows Lake and the Bellows Lake Outlet is important and should not be left out of the model. The model as constructed is not correct and should not be used for TMDL determinations until the Bellows Lake Outlet system is represented properly in the model.

Response:

Bellows Lake was represented as a separate LSPC sub-watershed upstream of the lake outlet, which was represented as a separate LSPC sub-watershed. The LSPC model represented the simple dynamics of the flow pathway within WBID 1579. Data within the WBID was limited, and no data from the control structure of the Bellows Lake existed, therefore it was determined that using LSPC to represent loadings from surrounding watershed and the lake would adequately represent the concentrations. This method allowed for accurate representation of the water quality concentrations in the outlet, as shown in the calibration results in Section 7, where LSPC was able to correctly match the nutrient, DO, and BOD trends in the lake outlet.

Comment:

4. It is understood that no flow monitoring stations are located in the WBID for which to calibrate the hydrologic predictions of the model. This makes the correct construction of the model network even more critical. Without proper hydrologic calibration or model construction, water quality predictions based on the model as presented are suspicious at best.

Response:

No hydrologic data was available for the Bellows Lake Outlet. By using calibration from the larger, calibrated Tampa model, the report was able to estimate flows from the watershed.

Comment:

5. What are the percentages of forest::wetland used in the natural conditions

modeling? What was the justification for assuming that the developed land would revert back to this same percentage? Was this assumption crosschecked with historical information such as old aerials?

Response:

For the natural condition scenario, 65% of anthropogenic land use was converted to forested land uses and 35% of anthropogenic land use was converted to wetland land uses. It is not expected that the developed land would revert back to natural conditions; however, this scenario was run to determine the natural condition loading of the watershed. This assumption was made based on the current forested and wetland land uses ratio in the area surrounding WBID 1579.

Water Quality Model

Florida Department of Transportation

Comment:

13. Model comparisons generally include a combination of graphical and statistical comparisons. No statistical comparisons are provided for the water quality calibration. This needs to be included in the report.

Response:

EPA routinely provides graphical comparison of models, which are sufficient for determine the capabilities of models in representing the measured trends of the waterbody. A presentation of the statistical comparisons, which are also often subjective to definitions regarding sufficient calibration, would not aid in TMDL development.

Comment:

8. The report states that the hydrodynamic calibration parameters from the larger Tampa Bay Watershed model were used to populate the Bellows Lake watershed model. The Tampa Bay Watershed model was calibrated to continuous flow U.S. Geological Survey (USGS) gages. No continuous measured flow data was located in the

Bellows Lake watershed, so no calibration updates were done for flow in Bellows Lake and the Tampa Bay Watershed model parameterization was used. Additionally, the water quality parameters from the larger Tampa Bay Watershed model were used to populate the Bellows Lake Watershed model. The Tampa Bay Watershed model was calibrated to several water quality stations whose data was taken from IWR38. The Bellows Lake watershed was calibrated to water quality data from IWR44. A successfully calibrated regional model does not imply that the local model is calibrated and providing accurate predictions at specific locations. For example, the current condition graphs presented below for TN and TP show that the model is not making water quality predictions accurately as the model predictions are not even within the ranges of the observed data.

Response:

There was no data available for hydrologic calibration in the Bellows Lake Watershed. For this reason, the hydrologic parameters had to be used from the larger model. The model was successfully calibrated to the region and when reviewing local data at the outlet of Bellows Lake shows that the model was able to predict TN and TP. A review of the calibration figures provided in the TMDL show that the model predictions are within range of the measured data. The DO measured data ranges between 2 mg/L and 8 mg/L, while the modeled DO ranges between 3 mg/L and 8 mg/L. BOD data was collected in 2005 and ranges between 1.5 mg/L and 4.5 mg/L, while the model predicts concentrations between 1 mg/L and 4 mg/L during this time frame. Modeled TN and TP are within the measured water quality ranges as well, with measured TN ranging between 1 mg/L and 2.5 mg/L in 2005 and the model predicting daily average between 0.5 mg/L and 2.5 mg/L approximately 98 percent of the time.

Duplicate Submittal

Michael J. Williams

Comment:

EPA received the same comments from Florida Department of Transportation on this TMDL proposal. See responses to FDOT.

Response:

WBIDs: 3073 Crabgrass Creek and 3084 Jane Green Creek

General

James B. Payne

Comment:

The proposed TMDLs indicate that the State criteria for nutrients in streams have been presented to EPA but are still under review and have not yet been adopted by the EPA. In addition, the proposed TMDL states that federal criteria have not been finalized and that EPA will consider any differences in what is being proposed and what is finally adopted by EPA. Therefore, EPA should not finalize any TMDL until after both State and federal criteria are finalized and appropriately evaluated with regards to these TMDLs.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved

oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Endpoints/Water Quality Targets

Florida Department of Transportation

Comment:

3. While the system does show episodes of low DO values, Chlorophyll a (Chl a) levels in the system are not elevated [<20 micrograms per liter (µg/L)]. Additionally, biological assessments indicate that generally, these systems are healthy even with the low DO values. The lowest DO measurements tend to occur during low or zero flow periods.

Response:

EPA does agree the lowest dissolved oxygen concentrations occur during low flow. EPA does understand that "biologically healthy" streams and rivers is an indication that the waterbody is at least partially meeting designated uses. There are other indices that are measured and compared to Florida's water quality standards which if not met the waterbody is determined to be impaired. In the case of this TMDL the dissolved oxygen criterion is not met.

Comment:

2. The TN data for Crabgrass Creek indicates that all observations are below the Florida Numeric Nutrient Criteria (NNC) of 1.54 mg/L. Only 2 of the 19 observations for TP are above the Florida NNC of 0.12 mg/L. The data would seem to indicate that this WBID is not impaired for nutrients.

Response:

EPA does acknowledge that both Florida and EPA have proposed numeric nutrient criteria for Florida flowing waters. EPA recently approved Florida's numeric nutrient criteria for flowing waters in Florida. While these criteria have been approved they are not effective for Clean Water Act purposes. Furthermore, Florida's numeric nutrient criteria still provides a provision that nutrients cannot cause a violation of any other water quality standard, this TMDL was done to the dissolved oxygen criteria.

Comment:

3. Nutrient reductions to natural conditions are proposed in the TMDL. The modeling indicates that under this scenario, DO does not meet 5.0 mg/L at all times, including normal daily and seasonal fluctuations. The Impaired Waters Rule (IWR) allows for waters to be de-listed if the impairment is determined to be caused by a natural

condition. In the absence of other evidence of impairment, this criterion is unreasonable for many of the streams in Florida. High summer temperatures, combined with low flow conditions, will result in DO values less than 5 mg/L even in pristine, healthy streams. The DO standard of 5 mg/L at all times is very likely to be unattainable in many streams in Florida.

Response:

While the TMDL does indicate that the dissolved oxygen criteria would not be met under natural conditions, it also shows that there are anthropogenic sources in the watershed that cause a depression of dissolved oxygen below the natural condition. The Impaired Waters Rule allows a waterbody to be placed in another category if a causative pollutant is not found, it is not placed in category 2 (achieving use support).

Comment:

The proposed TMDL states that DO will be used as the primary response variable. This is inappropriate, especially in light of the fact that the State has concluded that the 5.0 criteria is not the appropriate level of DO statewide and under all conditions. The proposal states that DO levels for these water bodies shall be maintained above the normal daily and seasonal fluctuations. It fails to realize that in Florida the normal daily and seasonal fluctuations for healthy water bodies are both below and above the 5.0 DO level. The criteria levels for DO presently proposed by the State are much lower and more accurately reflect what the correct DO levels should be for this water body. The proposed criteria levels reflect the variability of Florida waters.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Comment:

The proposed TMDLs do not adequately consider whether there is an imbalance in natural populations of aquatic flora and fauna in these WBIDs. Dissolved oxygen in these WBIDs is not closely correlated to the presence of nutrients. Moreover, the level of nutrients was not excessive, leading to the conclusion that there is no Imbalance in natural populations of aquatic flora and fauna. The biological data collected indicates that there is no imbalance in natural populations of aquatic flora and fauna.

Response:

EPA does understand that “biologically healthy” streams and rivers is one indication that

the waterbody may be at least partially meeting designated uses. There are other indices that are measured and compared to Florida's water quality standards which if not met the waterbody is determined to be impaired. In the case of this TMDL the dissolved oxygen criterion is not met. EPA will agree that nutrients in Jane Green and Crabgrass are not solely responsible for the dissolved oxygen criteria to be met, nutrients are contributing to reduced dissolved oxygen.

Assessment

Florida Department of Transportation

Comment:

4. The IWR allows for up to 10 percent of the DO measurements to fall below the standard of 5 mg/L before a water body is verified as impaired for DO. Yet once a water body is on the verified list, the methodology used to develop the TMDL, no matter how flawed or uncertain, must ensure zero violations of the standard. This conflict between the verification process and the TMDL process results in targets that are not reasonable and, quite probably, unattainable.

Response:

When EPA approved the Impaired Waters Rule (IWR), it agreed with the assessment methodology of the binomial test for impairment. That assessment methodology does not, however, change the frequency component of Florida's water quality standards. Rather, as set out more fully in EPA's 2008 determination following the agency's review of the 2007 amendments to the IWR and associated documents, the binomial test does not establish a new frequency component allowing ambient waters to exceed criteria 10% of the time. Rather, the binomial test uses a probability value of 10%, which serves as a data reliability provision related to the number of samples necessary to conclude that criteria have been exceeded in the waterbody as a whole. Similarly, Florida's dissolved oxygen water quality standard does not allow an exceedance frequency, thus the TMDL scenario cannot allow an exceedance.

Comment:

The Problem Definition beginning on Page 1 of the proposed TMDLs fails to recognize that the State Department of Environmental Protection "delisted" Wolf Creek and Jane Green Creek for nutrients; chlorophyll a concentrations were below the applicable impairment threshold and observed TN and TP concentrations did not appear elevated. On September 2, 2009, EPA approved Florida's delisting of 122 waters from Basin Groups 1, 2 and 5 where low dissolved oxygen concentrations were shown to be due to natural conditions. EPA has not yet issued a decision document as to Florida's Group 3 waters which would include Florida's proposed delisting of Wolf Creek and Jane Green Creek. It is probable that the delisting of the two streams would have been approved by EPA had EPA issued a decision document for Florida's Group 3 waters prior to the TMDL proposal date.

EPA needs to resolve all delisting issues before finalizing these TMDLs.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because EPA has not made decision on the Group 3 waters and this WBID is listed as impaired a TMDL was developed to meet a consent decree. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

Under the 1999 Consent Decree, EPA need not finalize a TMDL where closer inspection reveals that a TMDL is not needed or the WBID has been removed from the 303(d) list. Both are true for Wolf Creek (WBID 3075), and Jane Green Creek (WBID 3084) and it is evident that no TMDL is needed for nor will improve DO concentrations in Crabgrass Creek (WBID 3073).

Response:

EPA determined that while under a natural conditions the dissolved oxygen criteria is not met. There is a difference in predicted dissolved oxygen concentrations between the current and natural condition scenarios which indicates anthropogenic sources are causing a depression in dissolved oxygen. If there was no perceivable difference between these scenarios, EPA would have determined a TMDL is not needed.

Comment:

Once again, the loading numbers for the natural condition and the current condition are suspect. The required percentage reduction is unsupported in that there is no evidence that the streams are not presently meeting the State's designated uses or that the flora and fauna in the streams are unhealthy.

Response:

The percent reduction that is calculated for the TMDL is developed from the annual average loading rates of the current and natural condition. The waterbody is not currently meeting its designated use because it is not meeting all applicable water quality standards. In the case of this TMDL the dissolved oxygen criteria is not met.

Comment:

There is no indication that the BOD levels for these water bodies are producing a nuisance condition.

Response:

The TMDL established load reductions for BOD at the natural condition, along with nitrogen and phosphorus. This insures that no anthropogenic loadings are causing or contributing to depression of the dissolved oxygen concentration.

Comment:

The proposed TMDL concludes that the DO standard cannot be met under natural conditions. The TMDL is proposing to impose conditions on water bodies that are beyond natural. If a water body cannot meet the criteria under natural conditions then the criteria is not accurately established for the natural condition. The question should be whether the stream is healthy. The data collected does not show that the flora and fauna are unhealthy or that the stream is impaired.

Response:

EPA does understand that "biologically healthy" streams and rivers is one indication that the waterbody may be at least partially meeting designated uses. There are other indices that are measured and compared to Florida's water quality standards which if not met the waterbody is determined to be impaired. In the case of this TMDL the dissolved oxygen criterion is not met.

Analytical Approach

Florida Department of Transportation

Comment:

9. While inclusion of the model input files allowed for a review of the input parameters to both the LSPC+ and WASP models, the reports did not provide sources or justifications for parameter input values used. This should be included in the reports of the revised Crabgrass and Jane Green Creek models.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values

from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

2. While input files for the LSPC+ and WASP models were provided, the information provided within the report and appendix is not sufficient to determine whether or not the LSPC and WASP models were used correctly and appropriately or to adequately assess the model calibration and results. A complete summary and listing of input parameters and coefficients should be provided along with an explanation and justification for each of the input coefficients. A complete calibration of the model must be provided with appropriate calibration graphics and statistics. In addition, it is essential that the model report include a sensitivity analysis on the model inputs. For example, the natural background model scenario used to determine that there was no assimilative capacity available included a 50 percent reduction in sediment oxygen demand (SOD) in the natural condition, but it is not clear what methodology was utilized to define the reduced SOD values. Past experience with the WASP model suggests that the model is very sensitive to changes in SOD and it is imperative that this sensitivity be assessed

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as a set of conditions are needed for calculating a TMDL.

When EPA develops the natural condition run, the SOD rate that is used in the natural condition model is attenuated based upon the magnitude of change in the loadings. EPA has developed an SOD response curve which relates changes in expected SOD as a function in the change in loads using a spreadsheet version of Dominic DiToro's sediment diagenesis model.

Comment:

5. There is no Jane Green/Crabgrass Creek station in the Florida Climatological database. This appears to be the Ft. Drum Station and its data, which needs to be confirmed. Review of the Florida Climatological Database indicates the presence of a long-term rainfall station in Kennansville, which is in the Jane Green Creek watershed. Data from the Florida State Climatological Office are available from stations located in Orange, Osceola and Brevard Counties, including Orlando, Bithlo, Fellsmere, Melbourne, and Titusville. Why was these data not used to provide a better resolution of the Theissen Polygons?

Response:

The typographical error was changed in the modeling report, the commenter is correct the station used was Fort Drum. EPA relied on a set of meteorological stations that contained complete sets of conditions for the entire simulation period that is why the Fort Drum station was used. Other stations could have been included in the watershed model, EPA select the best available one.

Comment:

Assumptions and estimates for SOD rates are unsupported in the report.

Response:

EPA used measured rates whenever they are available. For areas where rates are not available, we rely on a database of SOD measurements that have been measured throughout Florida and the Southeast by our field services division. During model calibration the initial SOD rates may be modified slightly to improve calibration to low flow low dissolved oxygen periods that have been observed.

When EPA develops the natural condition run, the SOD rate that is used in the natural condition model is attenuated based upon the magnitude of change in the loadings. EPA has developed an SOD response curve which relates changes in expected SOD as a function in the change in loads using a spreadsheet version of Dominic DiToro's sediment diagenesis model.

Watershed Model

Florida Department of Transportation

Comment:

11. The TMDL report indicates that 2009 Florida Department of Environmental Protection (FDEP) land use data were used, whereas the modeling report indicates that 2004 Water Management District coverages were used.

Please clarify.

Response:

Landuse coverage was obtained from the St. Johns River Water Management District (Florida Landuse Classification Code) coverage developed from 2004. Correction will be made in the TMDL report.

Comment:

6. The modeling report states that "the watershed and water quality model were calibrated for flow by comparing the predict flows to the USGS gage USGS 02232155 Pennywash Creek near Deer Park, FL. While this gage is not in the direct watershed that drains to Jane Green/Crabgrass Creek, it is the closest gage in which to calibrate the model." This statement is incorrect because two long-term U.S. Geological Survey (USGS) stations exist within the WBIDs. Please explain why the Jane Green near Deer Park gage (USGS 02231600) and the Crabgrass Creek station (USGS 02231565) were not used in the calibration since it has been measuring flow since 1953.

Response:

Gage 02231600 was not used because flow at this gage is impacted by control structures S-161 and S-161A. The structures were not considered in the watershed model because it was not the intention to characterize the hydraulics of the drainage system but to estimate runoff volumes and nutrient export from sub-basins of the watershed. Gage 02231565 has two years of data (Oct 1996 to Sept 1998)

Comment:

8. While the use of the Pennywash Creek station flow data is inappropriate for hydrologic calibration as explained above, the modeling report does not explain how the flow data from Pennywash station was processed for use in this calibration. USGS has methods for processing data from nearby and similar basins to be used as surrogates for developing a flow time series (i.e., basin yield according to basin size) Please explain how the Pennywash Creek station data was processed for use as calibration data for the Jane Green and Crabgrass Creek watershed models.

Response:

The watershed drainage that contains the Pennywash station was simulated in addition to the Jane Green/Crabgrass drainage areas. Because Pennywash has no control structures and long term record, the LSPC model was calibrated to this adjacent basin and model parameterization was used for the development of the TMDL.

Comment:

10. There are no complete citations given for the documents referenced in either the

main report or in the supporting modeling report (Appendix). No complete reference to this report is provided, so it is not possible to assess the applicability of using this study for the Upper St. Johns River models.

Response:

The document will be updated with the appropriate citation.

St Johns River Water Management District, 2012. St John River Water Supply Impact Study. Technical Publication SJ2012-1. SJRWMD, Palatka, FL.

Comment:

12. Please provide the source of the event mean concentration (EMC) loadings are used in the LSPC model. (It is noted again that complete citations to the references used to determine the EMCs are not included in the report, so it cannot be determined if these values are reasonable.)

Response:

A. Harper, H.H. 2011. New Updates to the Florida Runoff Concentration (EMC) Database. Environmental Research & Design, Inc.

B. Harper, H.H. and D.M.Baker. 2007. Evaluation of Current Stormwater Design Criteria within the State of Florida. Final Report prepared for Florida Department of Environmental Protection.Environmental Research & Design, Inc. Orlando, FL.

C. Reiss, K.C., Evans, J., and M.Brown. 2009. Summary of Available Literature on Nutrient Concentrations and

Hydrology for Florida Isolated Wetlands. Final Report prepared for Florida Department of Environmental Protection. University of Florida, Gainesville, FL.

Comment:

7. The watersheds associated with these WBIDs are contained within the Jane Green Planning Unit and include the Jane Green Detention Area. Flow is controlled by structures S-161 and S-161A. Assuming that USGS stations 02231600 and 02231565 did not exist, the use of the Pennywash Creek station as a surrogate for flow calibration is inappropriate since the watersheds and their associated hydrologic response are not similar. The data from the Pennywash station would not reflect the hydrologic effect of structures S-161 and S-161A.

Response:

Pennywash flow is appropriate for characterizing the hydrology of the sub-basins of the Jane Green Planning Unit. The watershed model was used to estimate sub-basins flow volumes and nutrient exports and was not meant to characterize the hydraulics of the system.

Comment:

The proposal does not list the event mean concentrations that were applied to the modeled conditions. It merely talks about zero, low, medium and high. It is difficult to assess the loading without knowing the event mean concentrations for various land uses used in formulating the scenarios. The natural scenario assumes a 50/50 split between water and wetlands and upland forest. It is questionable whether this split is appropriate for the natural modeling scenarios.

Response:

A. Harper, H.H. 2011. New Updates to the Florida Runoff Concentration (EMC) Database. Environmental Research & Design, Inc.

B. Harper, H.H. and D.M.Baker. 2007. Evaluation of Current Stormwater Design Criteria within the State of Florida. Final Report prepared for Florida Department of Environmental Protection. Environmental Research & Design, Inc. Orlando, FL.

C. Reiss, K.C., Evans, J., and M.Brown. 2009. Summary of Available Literature on Nutrient Concentrations and Hydrology for Florida Isolated Wetlands. Final Report prepared for Florida Department of Environmental Protection. University of Florida, Gainesville, FL.

Water Quality Model

Florida Department of Transportation

Comment:

13. Please provide the source and/or justification for the WASP kinetic rates that are used in the model calibration and application.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

15. Temperature is consistently underestimated as seen in Figure 3, indicating that the

model is not calibrated.

Response:

The model does underestimate temperature; this is not because of flow. The underestimation is caused by the heating of water in the surrounding wetlands that is not accounted. A slight adjustment to the temperature functions and the calibration is much improved. This lead to no changes in the TMDL determination.

Comment:

17. In spite of underestimation of temperature, DO is consistently underestimated at DO >2 mg/L, as seen in Figures 4 and 5 indicating that the model is not calibrated.

Response:

EPA does agree when comparing the model output to measured results, the model tends to under predict. An index of agree of 0.57 tends to support the models calibration for a parameter like dissolved oxygen. Furthermore, the model does represent the data range where the system would be deemed impaired.

Comment:

14. The modeling report should include a sensitivity analysis of the major model input parameters, e.g., SOD, to gain a clearer understanding of exactly what is driving the model results and calibration.

Response:

EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as a set of conditions are needed for calculating a TMDL.

TMDL Determination

Florida Department of Transportation

Comment:

18. Once the model was deemed to be calibrated and the existing load conditions computed, the model was run to determine the natural conditions. The DO goal was not achieved under the natural condition scenario in which TN, TP, BOD and SOD were reduced to background levels. The specific percent reductions and loadings for TN, TP, and BOD are provided in the report, but the justification of the SOD values used in the various model runs are not provided. As discussed previously, the WASP model can be sensitive to changes in SOD, and it is important to understand this relationship in order to

have confidence in the model results. Detailed information about input values for both scenarios and how the natural condition SOD was determined is required to determine whether or not the results of the model are reasonable.

Response:

EPA does agree there is uncertainty associated with the sediment oxygen demand rates used in the model. EPA will use measured rates whenever they are available. For areas where rates are not available, we rely on a database of SOD measurements that have been measured throughout Florida and the Southeast by our field services division. During model calibration the initial SOD rates may be modified slightly to improve calibration to low flow low dissolved oxygen periods that have been observed.

When EPA develops the natural condition run, the SOD rate that is used in the natural condition model is attenuated based upon the magnitude of change in the loadings. EPA has developed an SOD response curve which relates changes in expected SOD as a function in the change in loads using a spreadsheet version of Dominic DiToro's sediment diagenesis model.

Comment:

19. The resultant loadings for current and natural conditions presented in the TMDL report do not match those presented in the modeling report. Please clarify this discrepancy.

Response:

The TMDL table was correct in the TMDL document. The modeling report table was not refreshed prior to creating the PDF file.

Typographical

Florida Department of Transportation

Comment:

16. The modeling report indicates a 13-year simulation period was used, whereas the TMDL report indicates that an 11-year simulation period was used. Please clarify this discrepancy.

Response:

The modeling report has been corrected.

Comment:

1. The analysis used to develop the TMDL did not use the best available information in the development and calibration of the models. Data from rainfall and flow stations located in the waterbody segments (WBIDs) and their contributing watershed are available but were not used. The watersheds associated with these WBIDs are contained within the

Jane Green Planning Unit and include the Jane Green Detention Area. Flow is controlled by structures S-161 and S-161A. The use of the Pennywash Creek station as a surrogate for flow calibration is inappropriate because the data do not reflect the hydrologic effect of these structures. It is especially inappropriate given the presence of long-term flow monitoring stations on both Crabgrass Creek and Jane Green Creek. There are a number of inconsistencies between the TMDL report and modeling report including the resultant current condition and TMDL condition loads and the simulation period used. The reports contain numerous references to Fort Drum Creek that need to be corrected.

Response:

The Pennywash Creek station was used to calibrate runoff from the landuse surfaces. The other gages in the Jane Green/Crabgrass Creek watersheds could not be used for calibration as they are influenced by gages. The typographical errors in the report will be corrected in the final version.

Comment:

With regard to WID 3084 Jane Green Creek/WBID 3073 Crabgrass Creek, the modeling report is wrong in several places. It appears that the Fort Drum data and maps may have been used rather than data from Jane Green and Crabgrass. Further, if rainfall data for Fort Drum was used in calculating the current and natural conditions then the calculations may be faulty.

Response:

The maps and GIS coverages provided in the modeling report have been corrected as needed. The Fort Drum meteorological station was used for Fort Drum. EPA had to rely on rain gages that have complete records of information for the simulation period.

WBID: 3154 Fort Drum Creek

General

James B. Payne

Comment:

The Modeling Report has errors. Once again, Ft. Drum appears to be the watershed examined or used in the modeling report, at least for the tables and figures and for rainfall data. Is the model correctly calibrated? Is the model correct? The Florida Turnpike is not close to these water bodies.

Response:

The modeling report has the correct figures for the Fort Drum WBID and surrounding watershed. The bottom portion of the Fort Drum WBID ends at the Florida Turnpike.

Endpoints/Water Quality Targets

Florida Department of Transportation

Comment:

2. Nutrient reductions to natural conditions are proposed in the TMDL. The modeling indicates that under this scenario, DO does not meet 5.0 mg/L at all times, including normal daily and seasonal fluctuations. The IWR allows for waters to be de-listed if the impairment is determined to be caused by a natural condition. In the absence of other evidence of impairment, this criterion is unreasonable for many of the streams in Florida. High summer temperatures, combined with low flow conditions, will result in DO values less than 5 mg/L even in pristine, healthy streams. The DO standard of 5 mg/L at all times is very likely to be unattainable in many streams in Florida.

Response:

When EPA approved the Impaired Waters Rule (IWR), it agreed with the assessment methodology of the binomial test for impairment. That assessment methodology does not, however, change the frequency component of Florida's water quality standards. Rather, as set out more fully in EPA's 2008 determination following the agency's review of the 2007 amendments to the IWR and associated documents, the binomial test does not establish a new frequency component allowing ambient waters to exceed criteria 10% of the time. Rather, the binomial test uses a probability value of 10%, which serves as a data reliability provision related to the number of samples necessary to conclude that criteria have been exceeded in the waterbody as a whole. Similarly, Florida's dissolved oxygen water quality standard does not allow an exceedance frequency, thus the TMDL scenario cannot allow an exceedance.

EPA determined that while under a natural conditions the dissolved oxygen criteria is not met. There is a difference in predicted dissolved oxygen concentrations between the current and natural condition scenarios which indicates anthropogenic sources are causing a depression in dissolved oxygen.

Comment:

1. At present, Florida is in the process of developing and approving revised DO criteria. While it is recognized that these criteria have not received final approval at this time, it is acknowledged by FDEP that the current DO standards are not appropriate, which led to the development of the new proposed DO criteria. Given this position regarding the DO standards, the determination that the system would not meet the DO criteria even under natural loadings may not reflect the "best science" as defined by U.S. Environmental Protection Agency (EPA) and Florida Department of Environmental Protection (FDEP) and may be inappropriate for defining load reductions.

Response:

EPA acknowledges that FDEP has begun the process of changing their dissolved oxygen

criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

Comment:

4. The DO standard for Florida waters is currently under revision. A discussion of the potential impact of this revision on these proposed TMDLs should be included.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Comment:

3. While the system does show episodes of low DO values, Chlorophyll a (Chl a) levels in the system are not elevated [<20 micrograms per liter (µg/L)]. Additionally, biological assessments indicate that generally, these systems are healthy even with the low DO values. The lowest DO measurements tend to occur during low or zero flow periods.

Response:

EPA does agree the lowest dissolved oxygen concentrations occur during low flow. EPA does understand that "biologically healthy" streams and rivers is an indication that the waterbody is at least partially meeting designated uses. There are other indices that are measured and compared to Florida's water quality standards which if not met the waterbody is determined to be impaired. In the case of this TMDL the dissolved oxygen criterion is not met.

Comment:

1. While the system does show episodes of low DO values, Chl a levels in the system are not elevated (<20 µg/L). Additionally, biological assessments indicate that generally, these systems are healthy even with the low DO values, which tend to occur during low and zero-flow periods. Fort Drum Creek is an ephemeral stream that exhibits zero flow approximately 10 percent of the time. Examination of the Chl a data indicates the Chl a levels are generally below 5.0 µg/L. Review of Chl a levels in Impaired Waters Rule (IWR) Run 47 indicates that only 3 of 31 values exceeded 5.0 µg/L. The following plot (Figure 1) shows the Chl a levels measured. Given that FDEP identifies annual average Chl a levels in-stream greater than 20 µg/L as candidates for impairment, the Chl a levels here would not be deemed "high."

Response:

EPA does agree that chlorophyll a levels are low in Fort Drum. This TMDL was done to protect anthropogenic sources from causing or contributing to dissolved oxygen concentrations below the States criteria.

Assessment

Florida Department of Transportation

Comment:

3. The IWR allows for up to 10 percent of the DO measurements to fall below the standard of 5 mg/L before a waterbody is verified as impaired for DO. Yet once a waterbody is on the verified list, the methodology used to develop the TMDL, no matter how flawed or uncertain, must ensure zero violations of the standard. This conflict between the verification process and the TMDL process results in targets that are not reasonable and, quite probably, unattainable.

Response:

When EPA approved the Impaired Waters Rule (IWR), it agreed with the assessment methodology of the binomial test for impairment. That assessment methodology does not, however, change the frequency component of Florida's water quality standards. Rather, as set out more fully in EPA's 2008 determination following the agency's review of the 2007 amendments to the IWR and associated documents, the binomial test does not establish a new frequency component allowing ambient waters to exceed criteria 10% of the time. Rather, the binomial test uses a probability value of 10%, which serves as a data reliability provision related to the number of samples necessary to conclude that criteria have been exceeded in the waterbody as a whole. Similarly, Florida's dissolved oxygen water quality standard does not allow an exceedance frequency, thus the TMDL scenario cannot allow an exceedance.

Analytical Approach

Florida Department of Transportation

Comment:

6. No discussion on calibration methodology such as what variables were calibrated to, what dependent variables were adjusted and how, were provided. This information should be provided.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data

point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

7. While inclusion of the model input files allowed for a review of the input parameters to both the LSPC+ and WASP models, the reports did not provide sources or justifications for parameter input values used. This should be provided.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

14. Conversion to the "natural condition" is done by converting all "anthropogenic" land uses to upland forest and wetlands, assuming 50 percent conversion to each. What justification is there for assuming that 50 percent of current anthropogenic land uses would be wetland in their natural state? This is important because the EMC values for biochemical oxygen demand (BOD), total nitrogen (TN) and total phosphorus (TP) used for wetlands are higher than for upland forest, resulting in an artificially high "natural" load. The wetland BOD EMC, for example, is 2.6 mg/L, while upland forest is 1.6 mg/L. Since the entire TMDL is premised on the fact that the DO standard cannot be met under natural conditions and very substantial reductions are required, the TMDL and model reports require a much more detailed explanation and justification of the development of the natural condition.

Response:

EPA relies on the natural condition scenario to determine if all applicable water quality standards can be met when there are no anthropogenic sources. EPA realizes to parameterize a watershed to a natural condition requires some assumptions. EPA Region 4 has been using this methodology to develop nutrient TMDLs for over 8 years. While the methodology is not perfect, it does use best available information and technical approach

to determine whether a particular water quality standard could ever be met. This methodology has been improved through the years based upon feedback from stakeholders and FDEP. Florida regulations will not allow the abatement of a natural condition; this determination is needed to determine the maximum load reduction that would have to occur without reducing to below natural conditions.

Comment:

2. While input files for the LSPC+ and WASP models were provided, the information provided within the report and appendix is not sufficient to determine whether or not the LSPC and WASP models were used correctly and appropriately or to adequately assess the model calibration and results. A complete summary and listing of input parameters and coefficients should be provided along with an explanation and justification for each of the input coefficients. A complete calibration of the model must be provided with appropriate calibration graphics and statistics. In addition, it is essential that the model report include a sensitivity analysis on the model inputs. For example, the natural background model scenario used to determine that there was no assimilative capacity available included a 40 percent reduction in sediment oxygen demand (SOD) in the natural condition, but it is not clear what methodology was utilized to define the reduced SOD values. Past experience with the WASP model suggests that the model is very sensitive to changes in SOD and it is imperative that this sensitivity be assessed.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

EPA relies on the natural condition scenario to determine if all applicable water quality standards can be met when there are no anthropogenic sources. EPA realizes to parameterize a watershed to a natural condition requires some assumptions. EPA Region 4 has been using this methodology to develop nutrient TMDLs for over 8 years. While the methodology is not perfect, it does use best available information and technical approach to determine whether a particular water quality standard could ever be met. This methodology has been improved through the years based upon feedback from stakeholders and FDEP. Florida regulations will not allow the abatement of a natural condition; this determination is needed to determine the maximum load reduction that would have to occur without reducing to below natural conditions.

EPA does agree there is uncertainty associated with the sediment oxygen demand rates used in the model. EPA will use measured rates whenever they are available. For areas

where rates are not available, we rely on a database of SOD measurements that have been measured throughout Florida and the Southeast by our field services division. During model calibration the initial SOD rates may be modified slightly to improve calibration to low flow low dissolved oxygen periods that have been observed. When EPA develops the natural condition run, the SOD rate that is used in the natural condition model is attenuated based upon the magnitude of change in the loadings. EPA has developed an SOD response curve which relates changes in expected SOD as a function in the change in loads using a spreadsheet version of Dominic DiToro's sediment diagenesis model.

Watershed Model

Florida Department of Transportation

Comment:

8. The LSPC+ model appears to use event mean concentration (EMC) loadings. Please provide the source of the EMC loadings used in the LSPC model. The complete citations to the references used to determine the EMCs are not included in the report, so it cannot be determined if these values are reasonable.

Response:

A. Harper, H.H. 2011. New Updates to the Florida Runoff Concentration (EMC) Database. Environmental Research & Design, Inc.

B. Harper, H.H. and D.M.Baker. 2007. Evaluation of Current Stormwater Design Criteria within the State of Florida. Final Report prepared for Florida Department of Environmental Protection. Environmental Research & Design, Inc. Orlando, FL.

C. Reiss, K.C., Evans, J., and M.Brown. 2009. Summary of Available Literature on Nutrient Concentrations and Hydrology for Florida Isolated Wetlands. Final Report prepared for Florida Department of Environmental Protection. University of Florida, Gainesville, FL.

Comment:

9. The modeling report indicates that the watershed model was applied to the Fort Drum watershed model for the simulation period of 1996 through 2009. The 1996 year was used to equilibrate the initial conditions in the watershed model (soil moisture, buildup and washoff), from 1997 through 2009 to predict flows and loads under current conditions that will be passed onto the water quality model. Review of the LSPC+ input files indicated the presence of EMC values but no information on accumulation rates. Please clarify.

Response:

The LSPC modeling approach used event mean concentrations for the various landuses to predict loadings to the receiving water. EPA did not use the build-up and washoff algorithms (which include accumulation) that are in LSPC to predict loadings.

Water Quality Model

Florida Department of Transportation

Comment:

10. Please provide the source and/or justification for the WASP kinetic rates that are used in the model calibration and application.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

16. The TMDL report states that "Figure 13 provides a time series of DO concentrations under natural conditions. The model predicts approximately 41% exceedances of the DO criteria and the minimum DO concentrations are 0.0 mg/L." This previous statement is inconsistent with Figure 13, presented below and Figure 14, DO Concentration Cumulative Distribution Function, Natural vs. Current Condition, which presents exceedances of the DO criteria of 93 and 98 percent, respectively.

Response:

The time series plot depicted in Figure 13 is correct, however the summary statistics were not recalculated. The document has been updated with a revised plot that has correct summary statistics.

Comment:

13. The model appears to be underestimating DO in the upper range and overestimating in the lower range (4 mg/L or less). Also, while the time series graph comparing simulated and observed DO (Figure 2) makes it difficult to see if seasonal patterns are captured, there appears to be a significant number of 0 mg/L DO in the simulation.

As this is an intermittent stream with no flow 10 percent of the time, were these anoxic episodes correlated to no-flow, or low flow events? This should be investigated as a check on calibration.

Response:

The water quality model does a very good job of representing the dissolved oxygen regime in Fort Drum. It does capture the range and seasonality of dissolved oxygen. EPA does agree that the very low predicted dissolved oxygen concentrations do occur during no flow conditions.

Comment:

11. The modeling report should include a sensitivity analysis of the major model input parameters, e.g., SOD, to gain a clearer understanding of exactly what is driving the model results and calibration.

Response:

EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as a set of conditions are needed for calculating a TMDL.

Comment:

5. The modeling report states, "While it is important to capture seasonal variation, duration and frequency of water quality, it is very critical to approximate average conditions in the system. It is during these periods of times that nutrients are expressed." Given the intermittent, or seasonal flow characteristics of Ft. Drum Creek, seasonal variation is more important. The timing of the loads is critical, especially for DO simulation. The calibration should include an assessment of the LSPC+/WASP models' performance during both zero and near zero-flow periods as well as during flowing conditions.

Response:

EPA does agree that the lowest dissolved oxygen concentrations occur during low flow. EPA does understand that "biologically healthy" streams and rivers is one indication that the waterbody may be at least partially meeting designated uses. There are other indices that are measured and compared to Florida's water quality standards which if not met the waterbody is determined to be impaired. In the case of this TMDL the dissolved oxygen criterion is not met.

Typographical

Florida Department of Transportation

Comment:

15. The TMDL Waste Load and Load Allocation table in the TMDL report do not

match those in the corresponding table in the Modeling Report. Please clarify this discrepancy.

Response:

This is corrected in the final version.

Comment:

12. The modeling report indicates a 13-year simulation period was used, whereas the TMDL report indicates that an 11-year simulation period was used. Please clarify this discrepancy.

Response:

This has been corrected in the final version.

WBID: 291 Jacks Branch

Endpoints/Water Quality Targets

Florida Department of Transportation

Comment:

5. Nutrient reductions are proposed in order to meet the requirement that DO be at least 5.0 mg/L at all times, including normal daily and seasonal fluctuations. The Impaired Waters Rule (IWR) allows for waters to be de-listed if the impairment is determined to be caused by a natural condition. In the absence of other evidence of impairment, this criterion is unreasonable for many of the streams in Florida. High summer temperatures combined with low flow conditions will result in DO values less than 5 mg/L even in pristine, healthy streams. The DO standard of 5 mg/L at all times is very likely to be unattainable in most streams in Florida.

Response:

The Jacks Branch model indicates that low DO is not caused by natural conditions. In the natural condition run, the daily average DO values were greater than 5 mg/L.

Comment:

6. The IWR allows for a percentage of the DO measurements to fall below the standard of 5 mg/L before a waterbody is verified as impaired for DO. Yet once a waterbody is on the verified list, the methodology used to develop the TMDL, no matter how flawed or uncertain, must ensure zero violations of the standard. This conflict between the verification process and the TMDL process results in targets that are not reasonable and quite probably unattainable.

Response:

When EPA approved the Impaired Waters Rule (IWR), it agreed with the assessment methodology of the binomial test for impairment. That assessment methodology does not, however, change the frequency component of Florida's water quality standards. Rather, as set out more fully in EPA's 2008 determination following the agency's review of the 2007 amendments to the IWR and associated documents, the binomial test does not establish a new frequency component allowing ambient waters to exceed criteria 10% of the time. Rather, the binomial test uses a probability value of 10%, which serves as a data reliability provision related to the number of samples necessary to conclude that criteria have been exceeded in the waterbody as a whole. Similarly, Florida's dissolved oxygen water quality standard does not allow an exceedance frequency, thus the TMDL scenario cannot allow an exceedance.

Comment:

7. The DO standard for Florida waters is currently under revision. A discussion of the potential impact of this revision on these proposed TMDLs should be included.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Comment:

1. At present, Florida is in the process of developing and approving revised DO criteria. While it is recognized that these criteria have not received final approval at this time, Florida Department of Environmental Protection (FDEP) acknowledged that the current DO standards are not appropriate, which led to the development of the new proposed DO criteria. Given this position regarding the DO standards, the determination that the system would not meet the DO criteria even under natural loadings may not reflect the "best science" as defined by EPA and FDEP and may be inappropriate for defining load reductions.

Response:

EPA does acknowledge that FDEP has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

Comment:

8. The TMDL summary table is confusing as presented. The Waste Load Allocation (WLA) section of the table is usually composed of point sources including wastewater/Industrial NPDES permitted facilities and NPDES-permitted stormwater facilities/MS4s. The TMDL summary table indicates that there is no WLA, yet a percent reduction is assigned to MS4s. Please clarify.

Response:

There are no NPDES-permitted facilities in Jacks Branch, and no WLA has been given. There is one MS4, FLS000019, which has been assigned the same percent reduction as the LA. Given the available data for the MS4, it is not possible to estimate concentrations coming exclusively from the MS4 areas because discharges from these sources can be highly intermittent, are usually characterized by very high flows occurring over relatively short time intervals. For this reason, all current and future MS4s permitted in the area are automatically prescribed a WLA equivalent to the percent reduction assigned to the LA. This is described in detail in Section 8.3.2 Municipal Separate Storm Sewer System Permits.

Assessment

Florida Department of Transportation

Comment:

1. FDEP proposed Jacks Branch Creek for de-listing for DO because the waterbody was determined to have low DO due to a natural condition (Category 4c). Median total nitrogen (TN), total phosphorus (TP), and biochemical oxygen demand (BOD) values were not elevated relative to comparable reference waters leading FDEP to conclude that biology and nutrients are not impaired for this waterbody. This proposal was rejected by EPA. EPA is requiring that the WBID remain on the 303(d) list as a Category 4d, i.e., impaired for DO but a causative pollutant cannot be determined. Since no pollutant can be identified, it is not appropriate to propose a TMDL targeting a specific pollutant.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

2. The discussion of BOD range and average value is misleading. Nearly all of the BOD measurements are below the method detection limit (MDL) or below the practical quantitative limit, and the minimum value of 0.2 mg/L that is reported is actually the reported method detection limit. Only one value out of 36 values is above FDEP's threshold of 2.0 mg/L, above which it is considered that BOD may be causing DO impairment. Therefore, the recommended 29 percent reduction in BOD does not make sense.

Response:

The TMDL established load reductions for BOD at the natural condition, which is also true for nitrogen and phosphorus. In the natural condition scenario, 29 percent of the BOD in the system is from anthropogenic sources, indicating that even though BOD is often below 2 mg/L in the system, a large portion of BOD is from anthropogenic sources. By reducing BOD this insures that no anthropogenic loadings are causing or contributing to depression of the dissolved oxygen concentration.

Comment:

3. The data analysis presented for TN and TP indicates periods of elevated TN are present. The mean and geometric mean for TN were 0.51 mg/L and 0.41 mg/L, respectively, with a maximum value of 1.22 mg/L. The mean and geometric mean for TP were 0.02 mg/L with the maximum value of 0.082 mg/L. All other values were at or below 0.04 mg/L. This compares to the proposed inland numeric nutrient criteria (NNC) for west-panhandle Florida of 0.67 mg/L for TN and 0.06 mg/L for TP. Based on this, the WBID appears to be meeting the criteria for TP. Given that the FDEP NNC are based upon biologically healthy systems, including DO, an 86 percent reduction in TP does not make sense.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

4. Chlorophyll a (Chl a) values are generally very low. Out of 40 measurements, all but two samples were at or below 10 micrograms per liter (µg/L), well below FDEP's threshold of 20 µg/L for potentially nutrient impaired waters.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

2. The data for these waterbodies do not suggest that there is a nutrient problem that would lead to low DO. Targeting nutrients to increase DO is not an effective strategy if there is no problem with nutrients to begin with.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Analytical Approach

Florida Department of Transportation

Comment:

5. Detailed citations of reports used to identify model input parameters are not provided.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values

from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

3. There is a significant amount of information missing from the TMDL report regarding how the modeling was performed and, as such, a complete review of the model and its assumptions is not possible.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as a set of conditions are needed for calculating a TMDL.

Comment:

4. A sensitivity analysis of model parameters is not provided.

Response:

EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as a set of conditions are needed for calculating a TMDL.

Watershed Model

Florida Department of Transportation

Comment:

14. All wetlands in the model are assumed to generate additional nutrient load. While it is true that there can be a net nutrient load associated with some wetlands, jurisdictional

wetlands that receive discharges from upland areas and then ultimately discharge to the waterbody are actually providing water quality treatment for the "pass-through" flows. Assigning an additional load to the wetland on top of an untreated load from the inflows to the wetland results in an overestimate of total loads.

Response:

EPA concurs that wetland can both generate additional nutrient loads and attenuate nutrient loads. Currently model parameterization of Jacks Branch Creek, nutrient loads from wetlands are lower than all anthropogenic land uses, reflecting that they are not a large source of nutrients in the Jacks Branch model. In riparian wetlands, dead and decaying plant material can act as a large nutrient source, and excessive nutrients into the wetland can disrupt the nutrient cycle and prevent complete attenuation of nutrient sources. Assigning small nutrient loads to wetlands, which represent approximately 14 percent of the current land uses does not cause the model to overestimate total nutrient loads in the system.

Comment:

17. The resultant DO time series for the existing, natural, and reduced nutrient conditions are presented in the following graphs. Inspection of the graphs indicates that the time series are very similar. As discussed previously, the report does not provide any details related to model construction or calibration, so it is not possible to evaluate this further. Given the similarities in the time series and DO values from Tables 7.1, 7.3 and 7.5 (6.56 mg/L for the existing condition, 6.58 mg/L for the natural condition and 6.57 mg/L for the reduced-nutrients condition), it appears that the nutrient and BOD reductions proposed make little if any difference in improving DO conditions. In fact, Figure 7.38 indicates no difference in DO predictions except for the lowest 1 percent of DO values. This indicates a DO condition that is natural, confirming what FDEP found during the Cycle 2 Verification Process.

This is further confirmation that the FDEP proposal for de-listing Jacks Branch Creek for DO because the waterbody was determined to have low DO due to a natural condition (Category 4c) was correct.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

15. The report does not address what changes to model parameters were made in constructing the natural conditions model and the reduced-nutrient models beyond the adjustment to land use. For example, were any adjustments made to benthic oxygen demand in the natural conditions model to reflect a lower loading condition? A modeling report specific to the Jacks Branch Creek models needs to be provided that includes a complete and comprehensive presentation of what went into the development of the current and natural conditions models, including all physical, hydrologic, and chemical inputs and all relevant model coefficients.

Response:

No model parameter changes were made in the natural condition scenario of the model. EPA believes that the modeling report was sufficient to describe the TMDL analysis. The complete list of physical, hydrologic, and chemical inputs and all relevant model coefficients is too lengthy to include in the modeling report. The administrative record for this TMDL contains all of the models and their associated input files. This information is available to the public upon request and may be reviewed at any time.

Comment:

13. Section 6.2.5 of the TMDL report states "Water and wetlands have very low event mean concentrations down to zero…" which confirms that the water and wetlands event mean concentration (EMC) used in the model are probably too high.

Response:

The EPA has reviewed the TMDL and was unable to find the exact language described above. Section 6.2.5 of the TMDL currently states the following:

"Water and Wetlands often have very low nutrient loadings, although decaying organic matter in wetlands can contribute to high organic nutrient concentrations."

Comment:

12. What are the percentages of forest::wetland used in the natural conditions modeling? What was the justification for assuming that the developed land would revert back to this same percentage? Was this assumption crosschecked with historical information such as old aerials? The TMDL report requires a much more detailed explanation and justification of the development of the natural and reduced-nutrient conditions.

Response:

For the natural condition scenario, 80% of anthropogenic land use was converted to forested land uses and 20% of anthropogenic land use was converted to wetland land uses. It is not expected that the developed land would revert back to natural conditions, however,

this scenario was run to determine the natural condition loading of the watershed. This assumption was made based on the current forested and wetland land uses ratio in the area surrounding WBID 291. Available aerial photographs dated back to 1994, at which point most of the development in WBID 291 and its contributing area had already occurred, preventing any crosschecking with historical information prior to basin development.

Comment:

11. Based on review of the LSPC input files provided by EPA, the model uses the build-up/wash-off methodology. The values used were reviewed in the model file, but no literature citation or documentation of how the build-up/wash-off values were derived was included.

Response:

Initial values for the parameters were taken from previous watershed modeling work done in the panhandle region of Florida, such as the Pensacola Watershed model. During the calibration process, model parameters were adjusted based on local knowledge of soil types and groundwater conditions, within reasonable constraints until an acceptable agreement was achieved between simulated and measured water quality.

Comment:

10. The TMDL report indicates that the Jacks Branch Creek watershed model was developed from the larger scale Perdido Watershed model. Other than stating the relatively large sub watersheds in the Perdido Watershed Model were re-delineated using the U.S. Geological Survey (USGS) National Hydrography Dataset (NHD) catchments with only the sub watersheds draining to the Jacks Branch Creek used to evaluate loadings in the Jacks Branch Creek watershed, no other modifications were discussed.

Response:

The Jacks Branch Creek watershed utilized the same input data as the larger Perdido Watershed model, including weather stations and land use. Other than modifying the delineation using the USGS NHD catchments and DEM, no additional modifications were made to the model.

Comment:

9. Information provided in the TMDL report on the model input parameters and the model calibration is insufficient to allow for a substantive review of the methodologies used to arrive at the proposed TMDL. A separate modeling report for Jacks Branch Creek should be prepared that provides complete information about the model inputs for the calibration and for all scenarios modeled. Justifications for parameter input values and calibration methodology and statistics should be included. Until sufficient information is provided to allow for a meaningful review of the model and results, this TMDL should not be finalized. Referring to the model completed for the larger Perdido Watershed (EPA

2012a and 2012b) is not sufficient for a complete review. As a note, LSPC+ modeling reports were requested from EPA following issuance of the proposed TMDLs. The documents provided were dated November 2011.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

16. The TMDL report should include a sensitivity analysis of the major model input parameters, e.g., benthic oxygen demand, in order to gain a clearer understanding of exactly what is driving the model results and calibration.

Response:

EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as a set of conditions are needed for calculating a TMDL.

WBIDS: 2351 Julington Creek and 2356 Big Davis

Endpoints/Water Quality Targets

Florida Department of Transportation

Comment:

2. At present, Florida is in the process of developing and approving revised DO criteria. While it is recognized that these criteria have not received final approval at this time, Florida Department of Environmental Protection (FDEP) acknowledged that the current DO standards are not appropriate, which led to the development of the new proposed DO criteria. Given this position regarding the DO standards, the determination that the system would not meet the DO criteria even under natural loadings may not reflect the "best science" as defined by EPA and FDEP and may be inappropriate for defining load reductions.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Comment:

11. The DO standard for Florida waters is currently under revision. A discussion of the potential impact of this revision on these proposed TMDLs should be included.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Comment:

9. Nutrient reductions are proposed to meet the requirement that DO be at least 5.0 mg/L at all times, including normal daily and seasonal fluctuations. The Impaired Waters Rule (IWR) allows for waters to be de-listed if the impairment is determined to be caused by a natural condition. In the absence of other evidence of impairment, this criterion is unreasonable for many of the streams in Florida. High summer temperatures combined with low flow conditions will result in DO values less than 5 mg/L even in pristine, healthy streams. The DO standard of 5 mg/L at all times is very likely to be unattainable in most streams in Florida.

Response:

When EPA approved the Impaired Waters Rule (IWR), it agreed with the assessment methodology of the binomial test for impairment. That assessment methodology does not, however, change the frequency component of Florida's water quality standards. Rather, as set out more fully in EPA's 2008 determination following the agency's review of the 2007 amendments to the IWR and associated documents, the binomial test does not establish a new frequency component allowing ambient waters to exceed criteria 10% of the time. Rather, the binomial test uses a probability value of 10%, which serves as a data reliability provision related to the number of samples necessary to conclude that criteria have been exceeded in the waterbody as a whole. Similarly, Florida's dissolved oxygen water quality standard does not allow an exceedance frequency, thus the TMDL scenario

cannot allow an exceedance.

There is a difference in predicted dissolved oxygen concentrations between the current and natural condition scenarios which indicates anthropogenic sources are causing a depression in dissolved oxygen.

Comment:

10. The IWR allows for a percentage of the DO measurements to fall below the standard of 5 mg/L before a waterbody is verified as impaired for DO. Yet once a waterbody is on the verified list, the methodology used to develop the TMDL, no matter how flawed or uncertain, must ensure zero violations of the standard. This conflict between the verification process and the TMDL process results in targets that are not reasonable and quite probably unattainable.

Response:

When EPA approved the Impaired Waters Rule (IWR), it agreed with the assessment methodology of the binomial test for impairment. That assessment methodology does not, however, change the frequency component of Florida's water quality standards. Rather, as set out more fully in EPA's 2008 determination following the agency's review of the 2007 amendments to the IWR and associated documents, the binomial test does not establish a new frequency component allowing ambient waters to exceed criteria 10% of the time. Rather, the binomial test uses a probability value of 10%, which serves as a data reliability provision related to the number of samples necessary to conclude that criteria have been exceeded in the waterbody as a whole. Similarly, Florida's dissolved oxygen water quality standard does not allow an exceedance frequency, thus the TMDL scenario cannot allow an exceedance.

There is a difference in predicted dissolved oxygen concentrations between the current and natural condition scenarios which indicates anthropogenic sources are causing a depression in dissolved oxygen.

Assessment

Florida Department of Transportation

Comment:

4. FDEP proposed Big Davis Creek and Julington Creek for de-listing for DO because the waterbody was determined to have low DO due to a natural condition (Category 4c). This proposal was rejected by EPA. EPA is requiring that both waterbody segments (WBIDs) remain on the 303(d) list as a Category 4d, i.e., impaired for DO but a causative pollutant cannot be determined. Since no pollutant can be identified, it is not appropriate to propose a TMDL targeting a specific pollutant.

Response:

EPA rejection of the de-listing request is substantiated by the development of this TMDL.

If the dissolved oxygen in Julington and Big Davis Creek was a natural condition, the predicted dissolved oxygen concentrations for the natural and existing condition scenario would virtually be the same. A review of the surrounding watershed is not indicative a natural condition.

Comment:

3. FDEP determined in the Cycle 2 assessments that Julington Creek and Big Davis Creek were not impaired for Chlorophyll a (Chl a) and historical Chl a. Additional biological assessments are required to confirm the non-impairment status, so both Julington Creek historical Chl a and Big Davis Creek Chl a and historical Chl a will be placed in Category 3b (additional data required) until assessments are completed.

Response:

Both Julington and Big Davis Creek were listed for both nutrients and dissolved oxygen. FDEP placed the WBIDs in category 3B because of insufficient information to develop a causative pollutant. Because these WBIDs are not de-listed, EPA is required to develop a TMDL under the conditions of the consent decree.

Comment:

5. The discussion of biochemical oxygen demand (BOD) range and average value is misleading. Nearly all of the BOD measurements are below the method detection limit or below the practical quantitative limit. The minimum value of 0.2 mg/L that is reported is actually the reported method detection limit. In addition, 2012 data for Julington Creek are not included, and all of these measurements are at or below 1.7 mg/L and below the practical quantitative limit of 2.0 mg/L. The median value of BOD when all of the values below method detection limit are removed, but values less that practical quantitative limit are included, is 1.8 mg/L. FDEP's threshold above which it is considered that BOD may be causing DO impairment is 2.0 mg/L, so the recommended 80 percent reduction in BOD does not make sense.

Response:

The percent reduction that is calculated is the difference in loadings between the current and natural condition scenario. EPA does agree there was not much BOD data with which to calibrate the model, but did rely on the best available information.

Comment:

3. The data for these water bodies do not suggest that there is a nutrient problem that would lead to low DO. Targeting nutrients to increase DO is not an effective strategy if there is no problem with nutrients to begin with.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

8. Chl a values are generally very low, with many samples reported as below the method detection limit. Out of 110 measurements combined for these two waters between 2001 and 2012, all but two samples were at or below 14 micrograms per liter (µg/L), well below FDEP's threshold of 20 µg/L for potentially nutrient impaired waters.

Response:

EPA agrees that chlorophyll a values are low. Chlorophyll a was not the response variable that was used in the development of this TMDL to set reductions in nutrients.

Comment:

7. Between 2002 and 2012, annual geometric mean values for total phosphorus (TP) range from 0.062 mg/L to 0.134 mg/L in Big Davis Creek and from 0.089 mg/L to 0.106 mg/L in Julington Creek. The only exceedance of the NNC of 0.12 mg/L is 0.134 mg/L in Big Davis Creek, and this one year exceedance is not sufficient to deem this waterbody impaired for nutrients. Given that the FDEP NNC are based upon biologically healthy systems, including DO, an 86 percent reduction in TP does not make sense.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

EPA does understand that "biologically healthy" streams and rivers is an indication that the waterbody is at least partially meeting designated uses. There are other indices that are measured and compared to Florida's water quality standards which if not met the waterbody is determined to be impaired. In the case of this TMDL the dissolved oxygen criterion is not met.

Comment:

6. Between 2001 and 2011, annual geometric mean values for total nitrogen (TN) range from 0.56 mg/L to 1.12 mg/L in Big Davis Creek and from 0.75 mg/L to 0.87 mg/L in Julington Creek. These values are well below the numeric nutrient criteria (NNC) for peninsular streams of 1.54 mg/L. Given that the FDEP NNC are based upon biologically healthy systems, including DO, a 67 percent reduction in TN does not make sense.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

EPA does understand that "biologically healthy" streams and rivers is an indication that the waterbody is at least partially meeting designated uses. There are other indices that are measured and compared to Florida's water quality standards which if not met the waterbody is determined to be impaired. In the case of this TMDL the dissolved oxygen criterion is not met.

Analytical Approach

Florida Department of Transportation

Comment:

18. Model calibration is confirmed by comparing measured average over the calibration period with modeled average over the calibration period. The calibration should really be looking at the range and trend of measured values vs. the range and trend of computed values. In many cases, the range and trend of the measured values are poorly represented by the range and trend of calibrated values. A discussion of the statistics presented should be included to justify the conclusion that the model is adequately calibrated.

Response:

EPA uses the best available information available to calibrate the watershed and water quality models. EPA does review the calibration to make sure that it represents the range and trends of the data. Because the model(s) provide output 4 times a day for 11 years there are a lot more predictions that measurements. Furthermore, the model is predicting water quality through a large range of meteorological conditions then what is typically measured in the field.

Comment:

17. The modeling report should include some discussion of the meaning of the statistics presented and whether or not the statistics indicate a well-calibrated model.

Response:

EPA's goal in presenting calibration plots and statistics is to provide the public both a quantitative and qualitative view of the models performance. Given the amount of monitoring data that is available for any given WBID it is very difficult to define and rate model performance on a set of criteria.

Comment:

27. Information provided in the model report on the model input parameters and the model calibration is insufficient to allow for a substantive review of the methodologies used to arrive at the proposed TMDL. Complete information about the model input should be provided in the model report for the calibration and for all scenarios modeled. Justifications for parameter input values should be included. Until sufficient information is provided to allow for a meaningful review of the model and results, this TMDL should not be finalized.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

1. The TMDL loads are all based on the LSPC model simulation of the natural condition. While this is a common practice in TMDL development, there are no assurances that the methodology used to convert to natural conditions is accurately representing the natural background loads.

Response:

EPA relies on the natural condition scenario to determine if all applicable water quality standards can be met when there are no anthropogenic sources. EPA realizes to parameterize a watershed to a natural condition requires some assumptions. EPA Region

4 has been using this methodology to develop nutrient TMDLs for over 8 years. While the methodology is not perfect, it does use best available information and technical approach to determine whether a particular water quality standard could ever be met. This methodology has been improved through the years based upon feedback from stakeholders and FDEP. Florida regulations will not allow the abatement of a natural condition; this determination is needed to determine the maximum load reduction that would have to occur without reducing to below natural conditions.

Comment:

1. The plots of water quality data are too busy and very difficult to read.

Response:

These plots are provided to give a glimpse of the measured data that is available for both assessment and TMDL development. For detailed review of the data in the Impaired Waters Rule database it can be obtained from the administrative record of this TMDL or from the Florida Department of Environmental Protection.

Comment:

6. Detailed citations of reports used to identify model input parameters are not provided.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

5. A sensitivity analysis of model parameters is not provided.

Response:

EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as

a set of conditions are needed for calculating a TMDL.

Comment:

4. Model inputs are not explained and justified adequately.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Watershed Model

Florida Department of Transportation

Comment:

12. Based on review of the LSPC input files provided by EPA, the model uses constant event mean concentration (EMC) values to define loads (i.e., the build-up/wash-off methodology is not used). The EMC values used are not presented in the model report, nor is there any literature citation or documentation of how the EMCs were derived. Please include a table in the model report of EMC values for each land use and reference citations.

Response:

The LSPC event mean concentrations are part of the model input files that are made available upon request. The citations for the event mean concentrations used in the LPSC model are:

A. Harper, H.H. 2011. New Updates to the Florida Runoff Concentration (EMC) Database. Environmental Research & Design, Inc.

B. Harper, H.H. and D.M.Baker. 2007. Evaluation of Current Stormwater Design Criteria within the State of Florida. Final Report prepared for Florida Department of Environmental Protection. Environmental Research & Design, Inc. Orlando, FL.

C. Reiss, K.C., Evans, J., and M.Brown. 2009. Summary of Available Literature on Nutrient Concentrations and Hydrology for Florida Isolated Wetlands. Final Report prepared for Florida Department of Environmental Protection. University of Florida, Gainesville, FL.

Comment:

13. It does not appear that the LSPC model incorporates use of Best Management Practices (BMP) in the loading calculations for the developed/urban areas. Published EMC values generally apply to untreated runoff, so by not including any allowance for in-place BMPs, the existing loads are most likely being significantly overestimated. A discussion of the application of BMPs should be included in the model report.

Response:

EPA developed the watershed model using the best available information and were calibrated to current conditions (which would include any previous BMPs in the basin).

Comment:

14. The LSPC files provided for the Julington Creek/Big Davis TMDL include input files for meteorological stations at St. Augustine Beach (file 087826R.air) and Gainesville Airport (083326.air). The LSPC input files use the St. Augustine station. The WASP input files provided include a file Met_Data.db. The input data in that file are for the Gainesville station. The rainfall plot in the model report is for the Gainesville gage even though the text and the rainfall figure caption state that the data are for a third station, 083137 (Fort Drum). Was it the intention of the modeler to use two different stations, one of which is more than 50 miles from the waters being modeled? If so, explain the justification for using two different meteorological input files and clarify which input parameters came from which file.

Response:

This is a typographical error, this has been corrected in the final document.

Comment:

15. There is a meteorological station at the Jacksonville Airport that could have been used for additional input. Due to its distance from the site, the Gainesville station is not appropriate for use in the Julington/Big Davis model. Why were the data from the Jacksonville model not considered in this TMDL?

Response:

EPA relied on a weather file that was developed by the St. Johns River Management District for their application of the HSPF model. EPA did this to insure that the flows and loads coming from this WBID is consistent with previous work.

Comment:

24. All wetlands in the model are assumed to generate additional nutrient load. While it is true that there can be a net nutrient load associated with some wetlands, jurisdictional wetlands that receive discharges from upland areas and then ultimately discharge to the

waterbody are actually providing water quality treatment for the "pass-through" flows. Assigning an additional load to the wetland on top of an untreated load from the inflows to the wetland results in an overestimate of total loads.

Response:

EPA does agree that wetlands can assimilate nutrient loadings from upstream/watershed segments, wetlands also have nutrients loads associated with them when it rains.

Comment:

23. Section 6.2.5 of the TMDL report states "Water and wetlands have very low event mean concentrations down to zero…." which confirms that the water and wetlands EMCs used in the model are probably too high.

Response:

EPA does agree that wetlands can assimilate nutrient loadings from upstream/watershed segments, wetlands also have nutrients loads associated with them when it rains.

Comment:

22. Conversion to the "natural condition" is done by converting all "anthropogenic" land uses to upland forest and wetlands, assuming 50 percent conversion to each. What justification is there for assuming that 50 percent of current anthropogenic land uses would be wetland in their natural state? This is important because the EMC values for BOD, TN and TP used for wetlands are higher than for upland forest, resulting in an artificially high "natural" load. The wetland BOD EMC, for example, is 2.6 mg/L, while upland forest is 1.4 mg/L. Since the entire TMDL is premised on the fact that the DO standard cannot be met under natural conditions and very substantial reductions are required, the TMDL and model reports require a much more detailed explanation and justification of the development of the natural condition.

Response:

EPA relies on the natural condition scenario to determine if all applicable water quality standards can be met when there are no anthropogenic sources. EPA realizes to parameterize a watershed to a natural condition requires some assumptions. EPA Region 4 has been using this methodology to develop nutrient TMDLs for over 8 years. While the methodology is not perfect, it does use best available information and technical approach to determine whether a particular water quality standard could ever be met. This methodology has been improved through the years based upon feedback from stakeholders and FDEP. Florida regulations will not allow the abatement of a natural condition; this determination is needed to determine the maximum load reduction that would have to occur without reducing to below natural conditions.

Water Quality Model

Florida Department of Transportation

Comment:

26. The modeling report should include a sensitivity analysis of the major model input parameters, e.g., SOD, in order to gain a clearer understanding of exactly what is driving the model results and calibration.

Response:

EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as a set of conditions are needed for calculating a TMDL.

Comment:

25. The modeling report state that "Sediment oxygen demand [SOD] is reduced based upon the percent reduction in nutrient loads" for conversion to the "natural condition." More information on both the SOD value under current condition and the assumed SOD value under the natural condition is needed. Actual values input into the model should be included in the report.

Response:

EPA does agree there is uncertainty associated with the sediment oxygen demand rates used in the model. EPA will use measured rates whenever they are available. For areas where rates are not available, we rely on a database of SOD measurements that have been measured throughout Florida and the Southeast by our field services division. During model calibration the initial SOD rates may be modified slightly to improve calibration to low flow low dissolved oxygen periods that have been observed.

When EPA develops the natural condition run, the SOD rate that is used in the natural condition model is attenuated based upon the magnitude of change in the loadings. EPA has developed an SOD response curve which relates changes in expected SOD as a function in the change in loads using a spreadsheet version of Dominic DiToro's sediment diagenesis model.

Comment:

20. The model report does not include any information on the values of the kinetic parameters used in the WASP water quality model. In addition to the values used, the model report should provide the source and/or justification for kinetic rates that are used.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

16. All of the BOD data used in the calibration are reported below detection of 2.0 mg/L. (T code = Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis or K code = Off-scale low. Actual value is known to be less than the value given.) A model cannot be calibrated against values that are below detection. In addition, FDEP's criterion for BOD potentially causing DO impairment is 2.0 mg/L. It does not make sense that this TMDL recommends an 80 percent reduction in BOD.

Response:

The percent reduction that is calculated is the difference in loadings between the current and natural condition scenario. EPA does agree there was not much BOD data in which to calibrate the model, but did rely on the best available information.

Comment:

21. The model does a poor job of predicting TN, TP, DO, and Chl a, particularly the appropriate ranges and trends, as shown in the following figures.

Response:

EPA used the best available information to calibrate the watershed and water quality model. Unfortunately, there is not much monitoring data available for Julington and Big Davis Creek. Clearly more data would aid in judging the performance of the model.

Typographical

Florida Department of Transportation

Comment:

19. Page 13, last sentence of the last paragraph reads "It is during these periods of times that nutrients are expressed." The meaning of this statement is not clear and cannot be

deduced from the rest of the paragraph.

Response:

This has been clarified in the final document.

Comment:

2. Figure 6 has the incorrect DO standard shown.

Response:

This has been corrected in the final version of the document.

WBIDS: 2893K Lake Poinsett and 2893I St. Johns River above Puzzle Lake

Endpoints/Water Quality Targets

Florida Department of Transportation

Comment:

3. At present, Florida is in the process of developing and approving revised DO criteria. While it is recognized that these criteria have not received final approval at this time, Florida Department of Environmental Protection (FDEP) acknowledged that the current DO standards are not appropriate, which led to the development of the new proposed DO criteria. Given this position regarding the DO standards, the determination that the system would not meet the DO criteria even under natural loadings may not reflect the "best science" as defined by EPA and FDEP and may be inappropriate for defining load reductions.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Assessment

Florida Department of Transportation

Comment:

3. Nutrient reductions are proposed in order to meet the requirement that DO be at least 5.0 mg/L at all times, including normal daily and seasonal fluctuations. The Impaired Waters Rule (IWR) allows for waters to be de-listed if the impairment is determined to be caused by a natural condition. In the absence of other evidence of impairment, this criterion is unreasonable for many of the streams in Florida. High summer temperatures combined with low flow conditions will result in DO values less than 5 mg/L even in pristine, healthy streams. The DO standard of 5 mg/L at all times is very likely to be unattainable in most streams in Florida.

Response:

When EPA approved the Impaired Waters Rule (IWR), it agreed with the assessment methodology of the binomial test for impairment. That assessment methodology does not, however, change the frequency component of Florida's water quality standards. Rather, as set out more fully in EPA's 2008 determination following the agency's review of the 2007 amendments to the IWR and associated documents, the binomial test does not establish a new frequency component allowing ambient waters to exceed criteria 10% of the time. Rather, the binomial test uses a probability value of 10%, which serves as a data reliability provision related to the number of samples necessary to conclude that criteria have been exceeded in the waterbody as a whole. Similarly, Florida's dissolved oxygen water quality standard does not allow an exceedance frequency, thus the TMDL scenario cannot allow an exceedance.

There is a difference in predicted dissolved oxygen concentrations between the current and natural condition scenarios which indicates anthropogenic sources are causing a depression in dissolved oxygen.

Comment:

4. The IWR allows for a percentage of the DO measurements to fall below the standard of 5 mg/L before a waterbody is verified as impaired for DO. Yet once a waterbody is on the verified list, the methodology used to develop the TMDL, no matter how flawed or uncertain, must ensure zero violations of the standard. This conflict between the verification process and the TMDL process results in targets that are not reasonable and quite probably unattainable.

Response:

When EPA approved the Impaired Waters Rule (IWR), it agreed with the assessment methodology of the binomial test for impairment. That assessment methodology does not, however, change the frequency component of Florida's water quality standards. Rather, as set out more fully in EPA's 2008 determination following the agency's review of the 2007 amendments to the IWR and associated documents, the binomial test does not establish a new frequency component allowing ambient waters to exceed criteria 10% of the time. Rather, the binomial test uses a probability value of 10%, which serves as a data

reliability provision related to the number of samples necessary to conclude that criteria have been exceeded in the waterbody as a whole. Similarly, Florida's dissolved oxygen water quality standard does not allow an exceedance frequency, thus the TMDL scenario cannot allow an exceedance.

Comment:

5. The DO standard for Florida waters is currently under revision. A discussion of the potential impact of this revision on these proposed TMDLs should be included.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Analytical Approach

Florida Department of Transportation

Comment:

6. A detailed model report was not provided. The model report should show the model calibration and include detailed discussion of model inputs.

Response:

EPA did develop a modeling report for this TMDL. This report is available as a public record.

Comment:

4. Model input files were provided, but a detailed modeling report was not. The TMDL report references an Appendix A that includes all of the modeled scenarios, but there is no Appendix A at the end of the document nor was an Appendix A posted to the web site.

Response:

EPA did develop a modeling report for this TMDL. This report is available as a public record.

Watershed Model

Florida Department of Transportation

Comment:

12. Section 6.2.5 of the TMDL report states "Water and wetlands have very low event mean concentrations down to zero…." which confirms that the water and wetlands EMCs used in the model are probably too high.

Response:

EPA does agree that wetlands can assimilate nutrient loadings from upstream/watershed segments, wetlands also have nutrients loads associated with them when it rains.

Comment:

13. All wetlands in the model are assumed to generate additional nutrient load. While it is true that there can be a net nutrient load associated with some wetlands, jurisdictional wetlands that receive discharges from upland areas and then ultimately discharge to the waterbody are actually providing water quality treatment for the "pass-through" flows. Assigning an additional load to the wetland on top of an untreated load from the inflows to thewetland results in an overestimate of total loads.

Response:

EPA does agree that wetlands can assimilate nutrient loadings from upstream/watershed segments, wetlands also have nutrients loads associated with them when it rains.

Comment:

11. The following table summarizes the natural land use (i.e., water, forest, and wetlands) EMCs used in the current condition and natural condition scenarios. If these land uses represent natural conditions, the EMCs should not change between the two scenarios. The change in wetlands TP from 0.68 to 0.06 mg/L is particularly drastic and does not make sense. If there is a reason or justification for changing the natural land use EMCs between the two scenarios, it should be discussed.

Response:

EPA simulated the disturbed and undisturbed wetland and forest landuses. Based on the following study, EPA believes these EMCs were appropriate for these waters.

C. Reiss, K.C., Evans, J., and M.Brown. 2009. Summary of Available Literature on Nutrient Concentrations and Hydrology for Florida Isolated Wetlands. Final Report prepared for Florida Department of Environmental Protection. University of Florida, Gainesville, FL.

Comment:

10. What justification is there for assuming that 50 percent of current anthropogenic land uses would be wetland in their natural state? This is important because the EMC

values for BOD, total nitrogen (TN) and TP used for wetlands are higher than for upland forest, resulting in an artificially high "natural" load. Since the entire TMDL is premised on the fact that the DO standard cannot be met under natural conditions and very substantial reductions are required, the TMDL and model reports require a much more detailed explanation and justification of the development of the natural condition.

Response:

EPA ran both scenarios 50:50 and 25:75 and the resulting load was virtually the same.

Comment:

9. The LSPC files provided indicate that two meteorological stations were used for input, Fort Drum 3 NW (083137.air) and Sanford (087982.air) but there is no discussion in the TMDL report on how the meteorological data were applied to the watershed and used in the model. A more detailed discussion of the meteorological inputs is needed and is most appropriately included in a detailed model report.

Response:

EPA did develop a modeling report for this TMDL This report is available as a public record. EPA used the two meteorological stations in this watershed application in the same manner as all others.

Comment:

8. It does not appear that the LSPC model incorporates use of Best Management Practices (BMP) in the loading calculations for the developed/urban areas. Published EMC values generally apply to untreated runoff, so by not including any allowance for in-place BMPs, the existing loads are most likely being significantly overestimated. A discussion of the application of BMPs should be included in the model report.

Response:

EPA developed the watershed model using the best available information andcalibrated to current conditions (which would include any previous BMPs in the basin).

Comment:

7. Based on review of the LSPC input files EPA provided, the model uses constant EMCs values to define loads (i.e., the build-up/wash-off methodology is not used). The EMC values used are not presented in the TMDL report, nor is there any literature citation or documentation of how the EMCs were derived. Please include a table of EMC values for each land use and references as to their source.

Response:

The LSPC event mean concentrations are part of the model input files that are made

available upon request. The citations for the event mean concentrations used in the LPSC model are:

A. Harper, H.H. 2011. New Updates to the Florida Runoff Concentration (EMC) Database. Environmental Research & Design, Inc.

B. Harper, H.H. and D.M.Baker. 2007. Evaluation of Current Stormwater Design Criteria within the State of Florida. Final Report prepared for Florida Department of Environmental Protection. Environmental Research & Design, Inc. Orlando, FL.

C. Reiss, K.C., Evans, J., and M.Brown. 2009. Summary of Available Literature on Nutrient Concentrations and Hydrology for Florida Isolated Wetlands. Final Report prepared for Florida Department of Environmental Protection. University of Florida, Gainesville, FL.

Comment:

1. The TMDL loads are all based on the LSPC model simulation of the natural condition. While this is a common practice in TMDL development, there are no assurances that the methodology used to convert to natural conditions is accurately representing the natural background loads.

Response:

EPA relies on the natural condition scenario to determine if all applicable water quality standards can be met when there are no anthropogenic sources. EPA realizes to parameterize a watershed to a natural condition requires some assumptions. EPA Region 4 has been using this methodology to develop nutrient TMDLs for over 8 years. While the methodology is not perfect, it does use best available information and technical approach to determine whether a particular water quality standard could ever be met. This methodology has been improved through the years based upon feedback from stakeholders and FDEP. Florida regulations will not allow the abatement of a natural condition; this determination is needed to determine the maximum load reduction that would have to occur without reducing to below natural conditions.

Comment:

2. Natural land use event mean concentrations (EMCs) (i.e., water, forest, wetlands) are different for the current condition and the natural condition model scenarios. They should be the same. In particular, the total phosphorus (TP) EMC for wetlands is reduced by more than 90 percent, from 0.68 mg/L to 0.06 mg/L.

Response:

This has been addressed in the final document.

Water Quality Model

Florida Department of Transportation

Comment:

14. Figure 22 (see below) suggests that the waterbody is meeting the DO criteria under natural conditions (as modeled for this TMDL development), at least at this location in the system.

Response:

The dissolved oxygen standard must be met in all locations within the WBID.

Source and Load Assessment

James B. Payne

Comment:

The statement that there are no continuous point source discharges in the watershed is insufficient. Insofar as there are episodic point source discharges in the watershed, these should be included in the TMDL. There is drainage from the east side of the St. Johns River upstream of Lake Poinsett, some of which are likely point source discharges.

Response:

According to the State of Florida's WAFR database of surface water dischargers falling under NPDES permits, there are no known dischargers in the watershed.

Endpoints/Water Quality Targets

James B. Payne

Comment:

There is a presumption that to achieve a balanced flora and fauna requires a DO level of 5.0. This presumption is not supported, and in fact, as stated above, the State is modifying its criteria for DO for waters such as Lake Poinsett. The DO level under natural conditions would not be 5.0. Setting a TMDL based upon a DO level of 5.0 is not appropriate. Again, the TMDL should not be finalized, and then should be revisited when Florida revises its DO criteria early in 2013.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Watershed Model

James B. Payne

Comment:

It is questionable whether the land uses are appropriately designated. It appears that rangeland is significantly understated and agriculture overstated thereby affecting the loading calculations for both the natural conditions and the current conditions. Rangeland was only 5% and Upland Forrest only 7 percent while Agriculture was 42%. The actual watershed boundary is different than depicted. Some of the area depicted does not affect the WBID's included in the TMDL proposal. These inconsistencies make the loading numbers inaccurate and unusable.

Response:

The landuse designation was taken from the St. Johns River Water Management District landuse classification from 2006. EPA did not reclassify any landuse in the development of this TMDL.

EPA used catchment areas as defined in the National Hydrography Dataset (NHDPlus) to determine the contributing watershed for Lake Poinsett.

TMDL Determination

James B. Payne

Comment:

Based on the enumerated shortcomings, reduction of 85% of the phosphorus load is not warranted, is not attainable, and is not required. A balanced flora and fauna for this water body is sustainable without such reductions. The assumptions and logic behind such reductions are flawed.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Typographical

James B. Payne

Comment:

The watershed description in the Proposed TMDL is incorrect. The present text describes Sawgrass.

Response:

This has been corrected in the final version of the document.

WBID: 1991C Myakka River

Branford N. Adumuah, City of North Port

Comment:

1. Comparison of nutrient data with the Florida Department of Environmental Protection (FDEP) Estuarine numeric nutrient criteria (NNC) Section 4.1 of the TMDL document indicated that "Should FDEP's numeric nutrient criteria become applicable water quality standards for CWA purposes before this TMDL is established, EPA will consider the nutrient target necessary to attain section 62-302.532, F.A.C. EPA will compare that target with the target necessary to attain paragraph 62-302.530(47)(a), F.A.C., to determine which target is more stringent."

On November 30, 2012, the EPA has approved FDEP's estuarine NNC listed under 62-302.532 F.A.C and the NNC criteria is currently awaiting adoption. The WBID 1991Ccorresponds to the Tidal Myakka estuarine segment with the following criteria for nutrients:

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

Use of Dissolved Oxygen (DO) to Determine Nutrient Impairment

The current DO criteria per FAC 62-302.530 (30),requires that the DO level be not less than 5.0 mg/L in a 24-hour period and never be less than 4.0 mg/L. The DO data in WBID #1991C shows the DO minimum concentration is 2.60 mg/L, and the mean concentration is 5.88 mg/L for the period from January 23, 2002 to October 10, 2007.

The current DO data in the WBID 1991C does not meet the minimum DO concentration criteria of 4.0 mg/L. However, both EPA and FDEP recognize that the current DO criteria needs to be revised as the shallow waters in the WBID 1991C and hot summer conditions can naturally result in low DO levels. Section 7.2.2 in the TMDL report indicated that the "natural condition modeling scenario indicated that the DO standard is not achievable under natural conditions, indicating that low DO is a naturally

occurring phenomenon in WBID 199JC.". FDEP has proposed a DO rule for Florida which is currently being evaluated. Until the DO criteria is revised, we respectfully ask EPA to reconsider using the current DO criteria to propose impairment for the nutrients parameters.

Response:

EPA does acknowledge that FDEP has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

Comment:

3. Use of two Models to Predict Natural Dissolved Oxygen

EPA used two different software programs (1) Loading Simulation Program C++ (LSPC) and (2) Water Quality Analysis Simulation Program Version 7.4.1 (WASP7) to model existing conditions DO levels. Both modeled existing conditions DO levels were then compared with existing real DO data (Figures 7.5 and 7.16) as part of the model calibration step. A significant portion of the existing real data does not correlate with the modeled DO data especially at low DO levels. Since the DO model calibration is questionable, using the DO model to predict what the natural conditions DO could have been to set the TMDL for nutrient impairment is also questionable. We respectfully request that EPA not use the modeled DO concentration to propose impairment for the nutrient parameters.

Response:

EPA does not rely on the models to propose or prove impairment. EPA relies on the dissolved oxygen data that is contained in the Impaired Waters Rule Database and uses the same assessment methodology to see if the waterbody currently meets the applicable water quality standards. The application of the natural condition modeling scenarios allows EPA to estimate what the natural dissolved oxygen concentration would be. We compare this prediction with the current condition, if there is an appreciable difference in the dissolved oxygen concentrations the TMDL is set at the natural condition because anthropogenic sources are causing or contributing to no meeting the State's dissolved oxygen criteria.

Comment:

4. Proposed TMDL Requiring 56% Total Nitrogen (TN) Reduction

EPA proposed a TMDL that required reducing TN loading back to the modeled natural conditions TN loading. This corresponds to a 56% TN reduction which seems to be overly

conservative and possibly unattainable. We respectfully request that the need and the extent of the percent TN reduction in this TMDL be re-evaluated.

5. Proposed TMDL Requiring 67% Total Phosphorus (TP) Reduction

EPA proposed a TMDL that required reducing TP loading back to the modeled natural conditions. This corresponds to a 67% TP reduction. WBID 1991 is located in the "Bone Valley" region which is aptly named for the naturally high phosphorus concentrations and supports the numerous phosphorus mining activities. There are many research studies that show that TP is not the limiting factor in this WBID. The proposed TMDL to reduce TP to natural conditions seems to be overly conservative, possibly unattainable and not necessary. We respectfully request that the need for a TP reduction in this TMDL be re-evaluated.

Response:

See response above in regards to the modeling scenarios to determine the TMDL. Because the waterbody does not meet the currently applicable water quality standard for dissolved oxygen, there is no assimilative capacity for pollutant loads above the natural condition. A site specific alternative criterion for dissolved oxygen could be developed here in the future.

Comment:

6. Need for Biological Confirmation of Impairment

Since the existing nutrient concentrations appear to meet the recent EPA/FDEP November 2012 nutrient 62-302.532 F.A.C criteria and the DO criteria is under revision, there needs to be biological confirmation that this WBID 1991C is impaired. There has not been a history of fish kills or algal blooms linked with nutrient impairment in this watershed. Please consider completing a biological assessment prior to deeming the watershed impaired.

Response:

EPA does understand that “biologically healthy” streams and rivers is one indication that the waterbody may be at least partially meeting designated uses. There are other indices that are measured and compared to Florida’s water quality standards which if not met the waterbody is determined to be impaired. In the case of this TMDL the dissolved oxygen criterion is not met.

Randall H. Reid

Comment:

The subject report correctly states that there are no surface water discharges within the watershed, so stormwater runoff was used to calculate load reductions. Florida enacted stormwater treatment regulations in the 1980s. Lands developed since these rules were enacted have substantially reduced pollutant loadings and may be overestimated if pollutant removal efficiencies are not calculated by the loading models.

Response:

The Charlotte watershed model was calibrated to data collected between 2000 and 2009, nearly two decades following the stormwater treatment regulations from the 1980s. Parameterization of the model would therefore include any reductions to stormwater pollutants that have occurred over the past several decades.

Comment:

Sarasota County has conducted a review of the data for the Myakka River WBID 1991C used in the referenced TMDL. The WBID is within the Tidal Myakka River estuarine region and has criteria expressed as annual averages for total nitrogen, total phosphorus and chlorophyll-a of 1.02 mg/L, 0.31 mg/L and 11.7 ug/L, respectively, not to be exceeded more than once in a three year period. These criteria were developed collaboratively by the Charlotte Harbor National Estuary Program and incorporated into the FDEP standards and were recently approved by the EPA.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

Annual average total nitrogen values for the period of 1998 through 2007 all fell below this new standard. Since the river is nitrogen limited, with a total nitrogen to total phosphorus ratio of 3.35 (according to FDEP's impairment list) keeping nitrogen in check is paramount to minimizing the expression of nutrients.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the

waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

As part of FDEP's continuing efforts to make water quality standards more relevant and specific to Florida, the Department is proposing new standards for dissolved oxygen, replacing the existing standard developed that was not appropriate to protecting aquatic species in Florida. The new proposed standard that would applicable to WBID 1991C is 41.7% saturation of dissolved oxygen. The proposed standard replaces concentration with percent oxygen saturation, a method that integrates salinity and temperature which are both highly variable and play an important role in the amount of dissolved oxygen in the water. Using the same data as was used in the TMDL, the following graph shows the vast majority (96%) of the data meet the new standard.

Response:

EPA does acknowledge that FDEP has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

Endpoints/Water Quality Targets

Florida Department of Transportation

Comment:

3. At present, Florida is in the process of developing and approving revised DO criteria. While it is recognized that these criteria have not received final approval at this time, the Florida Department of Environmental Protection (FDEP) acknowledged that the current DO standards are not appropriate, which led to the development of the new proposed DO criteria. Given this position regarding the DO standards, the determination that the system would not meet the DO criteria even under natural loadings may not reflect the "best science" as defined by EPA and FDEP and may be inappropriate for defining load reductions.

Response:

EPA does acknowledge that FDEP has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

Assessment

Florida Department of Transportation

Comment:

3. The data analyses were presented for TN and TP. The mean and geometric mean for TN were 0.95 mg/L and 0.92 mg/L, respectively. The mean and geometric mean for TP were 0.21 mg/L and 0.15 mg/L, respectively. The mean and geometric mean for corrected Chlorophyll a (CHLAC) were 7.15 micrograms per liter (µg/L) and 5.61 µg/L, respectively. This compares to the proposed inland numeric nutrient criteria (NNC) for west-central Florida of 1.65 mg/L for TN and 0.49 mg/L for TP. This also compares to the recently approved NNC for Tidal Myakka River of 1.02 mg/L for TN, 0.31 mg/L for TP and 11.7 µg/L for Chl a. The NNC considered a system's biological health in the development of the criteria for TN and TP. Given the nutrient levels in WBID 1991C and how they compare to the NNC values, the load reductions for TN and TP of 56 percent and 67 percent, respectively, that are proposed in this TMDL do not appear reasonable.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

4. Section 4.2 outlines the Dissolved Oxygen Criteria. Since EPA was willing to acknowledge the Florida Nutrient Criteria approved by the Environmental Regulation Commission (ERC), the Agency should also acknowledge that the DO standard for Florida waters is currently under revision. A discussion of the potential impact of this revision on these proposed TMDLs should be included.

Response:

EPA does acknowledge that FDEP has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

Comment:

In 2014, when the FDEP conducts an assessment of WBID 1991C as part of Group 3 watershed assessment process, this WBID may be delisted (designated as not verified

impaired) by DEP secretarial adoption and a TMDL may no longer be needed.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Analytical Approach

Florida Department of Transportation

Comment:

4. It appears that model set-up and calibration occurred at the regional scale and that a more "localized" model was not constructed for this TMDL analysis. Review of model-to-data comparisons indicated a lack of calibration at the more localized spatial scale.

Response:

The model was set-up at the regional scale, which ensures that the tides and mixing were correctly modeled in the Charlotte estuarine model. All areas of the model were calibrated to available data. The TMDL presents model calibration results at numerous stations, specifically 21FLSARAML-2-02, 21FLSARAML-2-03, 21FLSARAML-2-04, 21FLSARAML-2-05, 21FLSARAML-2-06, 21FLSARAML-2-07, 21FLSARAML-2-08, 21FLSARAML-2-09, 21FLSARAML-2-10, 21FLSARAML-2-11, 21FLSARAML-2-12, 21FLSARAML-4-01, 21FLSARAML-4-02, 21FLSARAML-4-03, 21FLSARAML-4-04, 21FLSARAML-4-05, 21FLSARAML-4-06, 21FLSARAML-4-07, 21FLSARAML-4-08, 21FLSARAML-4-09, 21FLSARAML-4-10, 21FLSARAML-4-11, and 21FLSARAML-4-12. The results of these model-to-data comparison are shown in Section 7 is well calibrated to salinity, temperature, dissolved oxygen, total nitrogen, total phosphorus, and chlorophyll-a.

Comment:

1. EPA used a series of complex watershed and receiving water models to assess the DO responses to changes in nutrient loads. Based upon a review of the TMDL document and supporting information, significant technical issues were raised relative to the adequacy of the models' physical representation of the system and the model calibration. While the documentation is helpful, some model development details are not provided, some key model-to-data comparisons are not provided, some methods of model application are not reasonable, and some of the calibration and validation results presented

bring the model into question.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

7. The report contains conflicting information on scenarios modeled and the condition represented by the TMDL. It is stated in Section 7.2.2 that a 50 percent reduction in anthropogenic loads is required to meet the TMDL target, and model results are presented in Figures 7.27 through 7.32. The reductions shown in Tables 8.1 and 8.2 are not 50 percent, and Section 8.2 states that the target was set for natural background conditions. A natural condition modeling scenario is not presented in the report. Please clarify what conditions were modeled and what condition the TMDL represents.

Response:

The anthropogenic load did not include loading from Lake Okeechobee or from forested and wetland land uses within the watershed area. The 50 percent anthropogenic load reduction resulted in a lower percent reduction when the total load into Lake Worth Lagoon was considered, which included all land uses and Lake Okeechobee.

The text has been updated in Section 7.2.2 and Section 8.2.

Watershed Model

Florida Department of Transportation

Comment:

10. The natural conditions model input file was not provided. This should be provided so that an assessment of its construction can be made.

Response:

EPA will provide the natural conditions model input file upon request. There were no changes to the modeling file with the exception of SOD, which was discussed in Comment 9, ID 146.

Comment:

5. No coefficient values utilized in the water quality simulations are provided in the TMDL report or the November 2011 Charlotte Harbor Watershed report. The full set of model coefficients needs to be provided in the report since the LSPC model is being utilized to project water quality levels in the stream segments. This should also be provided for the natural conditions scenario.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

6. No actual stream segment geometry is provided in the report to allow an evaluation of the accuracy of the channel cross-sections used in the LSPC models. As stream geometry is critical to accurate representation of DO, some discussion that shows, for each reach used in the DO simulations, how the model accurately reflects the velocities which drive reaeration needs to be provided.

Response:

The LSPC model has a representative reach defined for each sub-watershed, and the main channel stem within each sub-watershed was used as the representative reach. The characteristics for each reach include the length and slope of the reach, the channel geometry and the connectivity between the sub-watersheds. Length and slope data for each reach was obtained using the USGS National Elevation Dataset (NED) Digital Elevation Maps (DEM) and the USGS National Hydrography Dataset (NHD). Each representative reach in LSPC was assumed to be a completely mixed, one-dimensional segment with a trapezoidal cross section. Velocities vary throughout the channel in each subwatershed because of changes in the stream geometry. The model represents an average of these geometries using the NHD data.

Comment:

2. The TMDL loads are all based on the LSPC model simulation of the natural condition. While this is a common practice in TMDL development, there are no assurances that the model is accurately projecting the natural background loads. It would

be useful to do some comparisons of what the natural load is with more pristine waterbodies so that some determination can be made of how realistic the natural condition loads are.

Response:

EPA relies on the natural condition scenario to determine if all applicable water quality standards can be met when there are no anthropogenic sources. EPA realizes to parameterize a watershed to a natural condition requires some assumptions. EPA Region 4 has been using this methodology to develop nutrient TMDLs for over 8 years. While the methodology is not perfect, it does use best available information and technical approach to determine whether a particular water quality standard could ever be met. This methodology has been improved through the years based upon feedback from stakeholders and FDEP. Florida regulations will not allow the abatement of a natural condition; this determination is needed to determine the maximum load reduction that would have to occur without reducing to below natural conditions.

Water Quality Model

Florida Department of Transportation

Comment:

7. Review of the EFDC model-to-data comparisons for salinity in the Myakka River stations indicate that the model is not adequately calibrated in the local area in the WBID.

Response:

EPA has reviewed the calibration for salinity presented in Section 7 and believe that the model is well calibrated the local area of the WBID. The model is able to accurately represent periods of high flow in the Myakka river, resulting in low salinities, and periods where there is low flow resulting in high salinities.

Comment:

9. The report does not address what model parameter changes were made in constructing the natural conditions model beyond the adjustment to land use. For example, were any adjustments made to sediment oxygen demand (SOD) in the natural conditions model to reflect a lower loading condition? The report needs to provide a complete and comprehensive presentation of what went into the development of the current and natural conditions models, including all physical, hydrologic, and chemical inputs and all relevant model coefficients.

Response:

No model parameter changes were made in the LSPC natural condition scenario of the model, and the only changes made in the estuary natural condition models related to SOD.

Following the initial natural condition scenario run, sediment oxygen demand (SOD) was revised by using the following formula: SODrevised= (Avg Chlanatural / Avg Chlaexisting) * SOD, to represent the lower loading condition in the Myakka River. EPA believes that the modeling report was sufficient to describe the TMDL analysis. The complete list of physical, hydrologic, and chemical inputs and all relevant model coefficients is too lengthy to include in the modeling report. The administrative record for this TMDL contains all of the models and their associated input files. This information is available to the public upon request and may be reviewed at any time.

Comment:

11. An f-ratio of 1.5 was used for the 5-day biochemical oxygen demand (BOD5) to ultimate carbonaceous biochemical oxygen demand (CBODU) conversion. Provide some justification for this number based on local conditions.

Response:

The f-ratio was used as a calibration parameter to determine the appropriate transformation of BOD5 from the watershed loads to CBODU. There was no data available to EPA to support or refute this conversion rate.

Comment:

12. Only TN and TP comparisons are provided. Generally, WASP modeling of estuarine systems also presents the individual species comparisons. The data for the species are available and, therefore, the comparisons should be provided.

Response:

Data was available for inorganic nitrogen speciation and these comparisons have been provided in the updated report.

Comment:

14. The model appears to be underestimating DO at the WBID. This is an indication that while the regional model may be calibrated at a regional scale, it is not calibrated at this specific location, which is critical for the TMDL analysis.

Response:

The model is well calibrated to DO measurements in the downstream portion of WBID 1991C. The measured DO values range from 2 mg/L to 9 mg/L, while the modeled predicted DO values range from 2 mg/L to 10 mg/L. Further upstream in WBID 1991C, the model does predict DO concentrations that are lower than any measured data that was collected in this area. However, data was not collected in this area after 2004, while data at the downstream WBID does show that the model is predicted trends within the WBID throughout the entire modeled time period. A review of DO and all water quality

parameters indicates that the model is well calibrated at this specific local location.

Comment:

8. The report identifies that speciation of the TN and TP data were done for the WASP modeling but the ratios utilized for the speciation are not presented in the report. If this was taken as a global parameter from the overall Charlotte Harbor Modeling, this would be an issue since this would tend to be a very site-specific ratio depending upon the nature of the watershed.

Response:

The speciation of TN from LSPC into the WASP model is currently NH4 is 0.25%, OrgN is 0.50%, and NOx is 0.25% of the total nitrogen load, and the speciation of TP from LSPC into the WASP model is currently PO4 is 0.6% and OrgP 0.4% of the total phosphorus loads. These values were used for the entire Charlotte Harbor Modeling and were found to be well representative of the speciation of the watershed loads through calibration and validation of the model, including all major arms

TMDL Determination

Florida Department of Transportation

Comment:

5. This WBID is a Class II, marine waterbody, and the water quality standard for DO is 4 mg/L at all times and a daily average of 5 milligrams per liter (mg/L). The target used for the TMDL is the freshwater standard of 5 mg/L at all times. Under the natural conditions scenario, the model is predicting a minimum DO concentration of approximately 4.5 mg/L. This indicates that the reductions for a natural conditions scenario are not needed, and the water quality standard of 4.0 mg/L can be met with smaller reductions.

Response:

The results presented in the natural condition scenario are daily averages, which has been clarified in the text. Because the model is predicted daily averages, the natural condition scenario does not meet the daily average standard of 5 mg/L.

Comment:

16. The report states: Figure 7.38 and Figure 7.39 (shown below) provide the cumulative distribution function of DO concentrations for both the modeled existing condition and natural condition results, which show the increase in DO concentrations in the natural condition scenario. The results indicate that the natural conditions model is predicting a minimum DO concentration of approximately 4.5 mg/L. This would indicate that a natural conditions scenario is not necessary to meet the 4.0 mg/L target and that it can be achieved under a "reduced nutrient" scenario. Given the nutrient levels in WBID 1991C

and how they compare to the NNC values, this would provide a more reasonable load reduction requirement that is more consistent with the observed data and the applicable nutrient criteria.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

15. FDEP classifies this WBID as a Class II, estuarine water body. The TMDL analysis used 5 mg/L as the target DO concentration, whereas the criteria for this WBID is that DO concentrations shall never be less than 4

Response:

The DO criteria for a Class II waterbody also states that the average DO shall not be less than 5 mg/L in a 24-hour period. The DO target for this TMDL is the daily average, which has now been clarified in Section 4.0 Water

Quality Standards/TMDL Target:

"The TMDL reduction scenarios will be done to achieve a Florida's a daily average dissolved oxygen concentration of 5 mg/L and insure balanced flora and fauna or establish the TMDL to be consistent with a natural condition if the dissolved oxygen standard cannot be achieved."

Typographical

Florida Department of Transportation

Comment:

2. The TMDL summary table is confusing as presented. The Waste Load Allocation (WLA) section of the table is usually composed of point sources including wastewater/Industrial NPDES permitted facilities and NPDES-permitted stormwater facilities/MS4s. The TMDL summary table indicates that there is no WLA, yet a percent reduction is assigned to MS4s. Please clarify.

Response:

There are no NPDES-permitted facilities directly discharging to WBID 1991, therefore no

WLA was calculated.

However, the WBID was located within a NPDES-permitted MS4. The WLA for MS4s are expressed in terms of percent reductions equivalent to the reductions required for nonpoint sources, or Load Allocations (LA). Given the available data, it is not possible to estimate concentrations coming exclusively from the MS4 areas. This is described in greater detail in Section 8.3.2 Municipal Separate Storm Sewer System Permits.

Comment:

1. The report references 2012 modeling reports for the Charlotte Harbor Watershed and Charlotte Harbor that are not provided. EPA did provide 2011 reports for the LSPC modeling, but there is no assurance that the 2011 reports are the ones to be utilized. Additionally, no reports of the Charlotte Harbor EFDC and WASP model (which is referenced as being utilized for boundary condition development of sub-models) are provided.

Response:

These reports are available at www.regulations.gov as part of the Florida Numeric Nutrient Criteria Technical Support Documents. The watershed reports are available in Appendix C: Watershed Hydrology and Water Quality Modeling Report for Florida Watersheds and their attachments, and the estuary reports are available in Appendix D: Hydrodynamic and Water Quality Modeling Report for Nutrient Criteria for Florida Estuary Systems and their attachments. EPA believes that the modeling report in the TMDL was sufficient to describe the TMDL analysis.

WBID: 28931 Sawgrass Lake

General

James B. Payne

Comment:

The proposed TMDL on Sawgrass Lake (WBID 28931) has several errors in the Proposed TMDL and in the Modeling Report. It appears that the watershed boundaries for Sawgrass Lake are not accurate. A sizeable area not actually in this watershed is included in the examined area. This would make the land use numbers inaccurate. It would also affect the current condition and natural condition loadings. In addition, it appears that the Fort Drum data may have been used in modeling as evidenced in the Modeling Report. Further, if rainfall data for Fort Drum was used in calculating the current and natural conditions then the calculations are suspected to be wrong.

Response:

EPA used catchment areas as defined in the National Hydrography Dataset (NHDPlus) to

determine the contributing watershed for Sawgrass Lake. The Fort Drum rainfall station was used for Sawgrass Lake. This station represents the closest station to Sawgrass Lake that has a complete meteorological record.

Endpoints/Water Quality Targets

Florida Department of Transportation

Comment:

10. The waterbody has been identified as impaired for nutrients. Perhaps a nutrient target should be considered.

Response:

EPA interpreted Florida's narrative nutrient criteria and determined the most protective endpoint for this TMDL was the dissolved oxygen standard.

Comment:

6. Nutrient reductions are proposed in order to meet the requirement that DO be at least 5.0 mg/L at all times, including normal daily and seasonal fluctuations. The Impaired Waters Rule (IWR) allows for waters to be de-listed if the impairment is determined to be caused by a natural condition. In the absence of other evidence of impairment, this criterion is unreasonable for many of the streams in Florida. High summer temperatures combined with low flow conditions will result in DO values less than 5 mg/L even in pristine, healthy streams. The DO standard of 5 mg/L at all times is very likely to be unattainable in most streams in Florida.

Response:

When EPA approved the Impaired Waters Rule (IWR), it agreed with the assessment methodology of the binomial test for impairment. That assessment methodology does not, however, change the frequency component of Florida's water quality standards. Rather, as set out more fully in EPA's 2008 determination following the agency's review of the 2007 amendments to the IWR and associated documents, the binomial test does not establish a new frequency component allowing ambient waters to exceed criteria 10% of the time. Rather, the binomial test uses a probability value of 10%, which serves as a data reliability provision related to the number of samples necessary to conclude that criteria have been exceeded in the waterbody as a whole. Similarly, Florida's dissolved oxygen water quality standard does not allow an exceedance frequency, thus the TMDL scenario cannot allow an exceedance.

There is a difference in predicted dissolved oxygen concentrations between the current and natural condition scenarios which indicates anthropogenic sources are causing a depression in dissolved oxygen.

Comment:

4. At present, Florida is in the process of developing and approving revised DO criteria. While it is recognized that these criteria have not received final approval at this time, Florida Department of Environmental Protection (FDEP) acknowledged that the current DO standards are not appropriate, which led to the development of the new proposed DO criteria. Given this position regarding the DO standards, the determination that the system would not meet the DO criteria even under natural loadings may not reflect the "best science" as defined by EPA and FDEP and may be inappropriate for defining load reductions.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Comment:

8. The DO standard for Florida waters is currently under revision. A discussion of the potential impact of this revision on these proposed TMDLs should be included.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Comment:

9. If the problem with low DO were that nutrient concentrations are too high, some improvement in DO would be expected in a reduced nutrient scenario. This does not appear to be the case. Table 4 and Table 6 in the TMDL report and Table 5 and Table 7 of the modeling report show a reduction in annual average DO concentration from 5.12 mg/L in the current condition to 3.41 mg/L in the natural condition. This does not make sense and may indicate model instability or other problem with the model.

Response:

The natural condition table in the modeling report was a cut and paste error. This has been

corrected in the final version of the document. It shows that the predicted natural condition dissolved oxygen concentrations are higher than the existing condition.

Comment:

The proposed TMDL for Sawgrass states that the DO standard is not achievable under natural conditions and that therefore the TMDL will be set the allowable loads to natural conditions. As mentioned, the State is modifying its criteria for DO in this type of water body. Therefore, the proposed TMDL should not be finalized until after that work is completed early in 2013. It appears that when the new Florida DO standard is adopted Sawgrass will meet the DO standard.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Comment:

The proposed TMDL does not adequately consider whether there is an imbalance in natural populations of aquatic flora and fauna that actually exists in this WBID. Chlorophyll and dissolved oxygen in this WBID are not closely correlated to the presence of nutrients. The TP levels were not excessive. Therefore a 77% reduction is not warranted. There is no indication that reducing the phosphorus by that amount will achieve an acceptable DO level. There is no discussion about the ratio of TP to TN.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b). In the case of this TMDL, because the dissolved oxygen standard could not be met under a natural condition, the allowable loads were set to natural condition loadings.

Comment:

The proposed TMDLs indicate that the State criteria for nutrients in streams have been presented to EPA but are still under review and have not yet been adopted by the EPA. In

addition, the proposed TMDL states that federal criteria have not been finalized and that EPA will consider any differences in what is being proposed and what is finally adopted by EPA. Therefore, EPA should not finalize any TMDL until after both State and federal criteria are finalized and appropriately evaluated with regards to these TMDLs.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-

302.530(47)(b).

Assessment

Florida Department of Transportation

Comment:

4. The plots of water quality data are too busy and very difficult to read.

Response:

These plots are provided to give a glimpse of the measured data that is available for both assessment and TMDL development. For detailed review of the data in the Impaired Waters Rule database it can be obtained from the administrative record of this TMDL or from the Florida Department of Environmental Protection.

Comment:

7. The IWR allows for a percentage of the DO measurements to fall below the standard of 5 mg/L before a waterbody is verified as impaired for DO. Yet once a waterbody is on the verified list, the methodology used to develop the TMDL, no matter how flawed or uncertain, must ensure zero violations of the standard. This conflict between the verification process and the TMDL process results in targets that are not reasonable and quite probably unattainable.

Response:

When EPA approved the Impaired Waters Rule (IWR), it agreed with the assessment methodology of the binomial test for impairment. That assessment methodology does not, however, change the frequency component of Florida's water quality standards. Rather, as set out more fully in EPA's 2008 determination following the agency's review of the 2007 amendments to the IWR and associated documents, the binomial test does not

establish a new frequency component allowing ambient waters to exceed criteria 10% of the time. Rather, the binomial test uses a probability value of 10%, which serves as a data reliability provision related to the number of samples necessary to conclude that criteria have been exceeded in the waterbody as a whole. Similarly, Florida's dissolved oxygen water quality standard does not allow an exceedance frequency, thus the TMDL scenario cannot allow an exceedance.

Comment:

5. FDEP identified Sawgrass Lake as impaired for DO in Cycle 1 (2005) and for nutrients in Cycle 2 (2010).

Response:

Sawgrass Lake was also listed on the 1998 303(d) for nutrients and dissolved oxygen.

Analytical Approach

Florida Department of Transportation

Comment:

5. Model inputs are not explained and justified adequately.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

6. A sensitivity analysis of model parameters is not provided.

Response:

EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as a set of conditions are needed for calculating a TMDL.

Comment:

7. Detailed citations of reports used to identify model input parameters are not provided.

Response:

The citations for the event mean concentrations are:

A. Harper, H.H. 2011. New Updates to the Florida Runoff Concentration (EMC) Database. Environmental Research & Design, Inc.

B. Harper, H.H. and D.M. Baker. 2007. Evaluation of Current Stormwater Design Criteria within the State of Florida. Final Report prepared for Florida Department of Environmental Protection. Environmental Research & Design, Inc. Orlando, FL.

C. Reiss, K.C., Evans, J., and M. Brown. 2009. Summary of Available Literature on Nutrient Concentrations and Hydrology for Florida Isolated Wetlands. Final Report prepared for Florida Department of Environmental Protection. University of Florida, Gainesville, FL.

The citation for the St. Johns River Water Management District's HSPF study is:

The document will be updated with the appropriate citation.

St Johns River Water Management District, 2012. St John River Water Supply Impact Study. Technical Publication SJ2012-1. SJRWMD, Palatka, FL

Comment:

26. Information provided in the model report on the model input parameters and the model calibration is insufficient to allow for a substantive review of the methodologies used to arrive at the proposed TMDL. Complete information about the model input should be provided in the model report for the calibration and for all scenarios modeled. Justifications for parameter input values should be included. Until sufficient information is provided to allow for a meaningful review of the model and results, this TMDL should not be finalized.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Watershed Model

Florida Department of Transportation

Comment:

19. The model report states that two scenarios were considered for the conversion to "natural condition."

"Anthropogenic" land uses were changed to wetland and upland forest using both a 75:25 wetland:forest ratio and a 50:50 wetland:forest ratio. The TMDL report states that the conversion was a 50:50 ratio. A review of portions of the two input files provided (current condition and natural condition) suggests that the actual conversion used was 75:25. This should be clarified in both reports.

Response:

This has been clarified in the final reports.

Comment:

20. What is the justification for assuming that 75 (or 50) percent of current anthropogenic land uses would be wetland in their natural state? This is important because the EMC values for BOD, TN and TP used for wetlands are higher than for upland forest, resulting in an artificially high "natural" load. Since the entire TMDL is premised on the fact that the DO standard cannot be met under natural conditions and very substantial reductions are required, the TMDL and model reports require much more detailed explanation and justification of the development of the natural condition.

Response:

EPA relies on the natural condition scenario to determine if all applicable water quality standards can be met when there are no anthropogenic sources. EPA realizes to parameterize a watershed to a natural condition requires some assumptions. EPA Region 4 has been using this methodology to develop nutrient for over 8 years. While the methodology is not perfect, it does use best available information and technical approach to determine whether a particular water quality standard could ever be met. This methodology has been improved through the years based upon feedback from stakeholders and FDEP. Florida regulations will not allow the abatement of a natural condition; this determination is needed to determine the maximum load reduction that would have to occur without reducing to below natural conditions.

Comment:

21. The following table summarizes the natural land use (i.e., water, forest, and wetlands) EMCs used in the current condition and natural condition scenarios. If these land uses represent natural conditions, the EMCs should not change between the two scenarios. The change in wetlands TP from 0.68 to 0.06 mg/L is particularly drastic and does not

make sense. If there is a reason or justification for changing the natural land use EMCs between the two scenarios, it should be discussed in the modeling report.

Response:

This has been corrected in the final version of the document and the models.

Comment:

12. It does not appear that the LSPC model incorporates use of Best Management Practices (BMP) in the loading calculations for the developed/urban areas. Published EMC values generally apply to untreated runoff, so by not including any allowance for in-place BMPs, the existing loads are most likely being significantly overestimated. A discussion of the application of BMPs should be included in the model report.

Response:

EPA developed the watershed model using the best available information and were calibrated to current conditions (which would include any previous BMPs in the basin).

Comment:

23. All wetlands in the model are assumed to generate additional nutrient load. While it is true that there can be a net nutrient load associated with some wetlands, jurisdictional wetlands that receive discharges from upland areas and then ultimately discharge to the waterbody are actually providing water quality treatment for the "pass-through" flows. Assigning an additional load to the wetland on top of an untreated load from the inflows to the wetland results in an overestimate of total loads.

Response:

EPA does agree that wetlands can assimilate nutrient loadings from upstream/watershed segments, wetlands also have nutrients loads associated with them when it rains.

Comment:

11. Based on review of the LSPC input files EPA provided, the model uses constant EMC values to define loads (i.e., the build-up/wash-off methodology is not used). The EMC values used are not presented in the model report, nor is there any literature citation or documentation of how the EMCs were derived. Please include a table of

EMC values for each land use in the model report and references as to their source.

Response:

The LSPC event mean concentrations are part of the model input files that are made available upon request. The citations for the event mean concentrations used in the LPSC model are:

A. Harper, H.H. 2011. New Updates to the Florida Runoff Concentration (EMC) Database. Environmental Research & Design, Inc.

B. Harper, H.H. and D.M. Baker. 2007. Evaluation of Current Stormwater Design Criteria within the State of Florida. Final Report prepared for Florida Department of Environmental Protection. Environmental Research & Design, Inc. Orlando, FL.

C. Reiss, K.C., Evans, J., and M. Brown. 2009. Summary of Available Literature on Nutrient Concentrations and Hydrology for Florida Isolated Wetlands. Final Report prepared for Florida Department of Environmental Protection. University of Florida, Gainesville, FL.

Comment:

22. Section 6.2.5 of the TMDL report states "Water and wetlands have very low event mean concentrations down to zero…." which confirms that the water and wetlands EMCs used in the model are probably too high.

Response:

EPA does agree that wetlands can assimilate nutrient loadings from upstream/watershed segments, wetlands also have nutrients loads associated with them when it rains.

Comment:

3. Natural land use event mean concentrations (EMCs) (i.e., water, forest, wetlands) are different for the current condition and the natural condition model scenarios. They should be the same. In particular, the total phosphorus (TP) EMC for wetlands is reduced by more than 90 percent, from 0.68 mg/L to 0.06 mg/L.

Response:

This has been addressed in the final document and models.

Comment:

13. The LSPC files provided indicate that two meteorological stations were used for input, Fort Drum 3 NW (083137.air) and Sanford (087982.air). The Sanford station was used for just one of the subbasins, 130021, as shown in the following figure. Fort Drum meteorological data were used for the other subbasins. The Sanford station is 59 miles to the north and Fort Drum is 27 miles south, so why were the subbasins broken out this way?

A more detailed discussion of the meteorological inputs is needed in the model report.

Response:

The Fort Drum rain gage was used for the development of the Wolf Creek TMDL. EPA relied on meteorological stations that had complete records for the simulation period.

Comment:

2. The TMDL loads are all based on the LSPC model simulation of the natural condition. While this is a common practice in TMDL development, there are no assurances that the methodology used to convert to natural conditions is accurately representing the natural background loads.

Response:

EPA relies on the natural condition scenario to determine if all applicable water quality standards can be met when there are no anthropogenic sources. EPA realizes to parameterize a watershed to a natural condition requires some assumptions. EPA Region 4 has been using this methodology to develop nutrient TMDLs for over 8 years. While the methodology is not perfect, it does use best available information and technical approach to determine whether a particular water quality standard could ever be met. This methodology has been improved through the years based upon feedback from stakeholders and FDEP. Florida regulations will not allow the abatement of a natural condition; this determination is needed to determine the maximum load reduction that would have to occur without reducing to below natural conditions.

Comment:

It is questionable whether the land uses are appropriately designated. It appears that rangeland is grossly understated and agriculture overstated, thereby affecting the loading calculations for both the natural conditions and the current conditions.

Response:

The landuse designation was taken from the St. Johns River Water Management District landuse classification from 2006. EPA did not reclassify any landuse in the development of this TMDL.

Comment:

There are areas of naturally occurring phosphorus within the watershed. Runoff from these areas should not be considered in the modeling.

Response:

Areas that have naturally occurring phosphorus would be accounted for in the event mean concentrations assigned to those landuse types. These areas must be included in the modeling and the development of TMDL to have a defensible determination.

Water Quality Model

Florida Department of Transportation

Comment:

14. The modeling report should include some discussion of the meaning of the statistics presented and whether or not the statistics indicate a well-calibrated model.

Response:

EPA's goal in presenting calibration plots and statistics is to provide the public both a quantative and qualitative view of the models performance. Given the amount of monitoring data that is available for any given WBID it is very difficult to define and rate model performance on a set of criteria.

Comment:

25. The modeling report should include a sensitivity analysis of the major model input parameters, e.g., SOD, to gain a clearer understanding of exactly what is driving the model results and calibration.

Response:

EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as a set of conditions are needed for calculating a TMDL.

Comment:

24. The modeling report state that "Sediment oxygen demand [SOD] is reduced based upon the percent reduction in nutrient loads" for conversion to the "natural condition." More information on both the SOD value under current condition and the assumed SOD value under the natural condition is needed. Actual values input into the model should be included in the report.

Response:

EPA will use measured rates whenever they are available. For areas where rates are not available, we rely on a database of SOD measurements that have been measured throughout Florida and the Southeast by our field services division. During model calibration the initial SOD rates may be modified slightly to improve calibration to low flow low dissolved oxygen periods that have been observed.

When EPA develops the natural condition run, the SOD rate that is used in the natural condition model is attenuated based upon the magnitude of change in the loadings. EPA has developed an SOD response curve which relates changes in expected SOD as a function in the change in loads using a spreadsheet version of Dominic DiToro's sediment diagenesis model.

Comment:

15. Model calibration is confirmed by comparing measured average over the calibration period with modeled average over the calibration period. The calibration should really be looking at the range and trend of measured values versus the range and trend of computed values. In many cases, the range and trend of the measured values are poorly represented by the range and trend of calibrated values. A discussion of the statistics presented should be included to justify the conclusion that the model is adequately calibrated.

Response:

EPA uses the best available information available to calibrate the watershed and water quality models. EPA does review the calibration to make sure that it represents the range and trends of the data. Because the model(s) provide output 4 times a day for 11 years there are a lot more predictions that measurements. Furthermore, the model is predicting water quality through a large range of meteorological conditions then what is typically measured in the field.

Comment:

18. The model is not very well calibrated. The range of predicted DO is reasonable compared with measured data, but calibrations for Chlorophyll a (Chl a), total nitrogen (TN), nitrogen species, TP, and biochemical oxygen demand (BOD), are poor as shown in the following figures. It is also noted that much of the BOD data used for calibration are samples reported as below method detection limit, which renders the calibration meaningless.

Response:

EPA uses the best available information available to calibrate the watershed and water quality models. EPA does review the calibration to make sure that it represents the range and trends of the data. Because the model(s) provide output 4 times a day for 11 years there are a lot more predictions that measurements. Furthermore, the model is predicting water quality through a large range of meteorological conditions then what is typically measured in the field.

Comment:

17. The model report does not include any information on the values of the kinetic parameters used in the WASP water quality model. In addition to the values used, the model report should provide the source and/or justification for kinetic rates that are used.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are

engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

16. On Page 11of the modeling report, last sentence of the last paragraph reads "It is during these periods of times that nutrients are expressed." The meaning of this statement is not clear and cannot be deduced from the rest of the paragraph.

Response:

This has been clarified in the final document.

Typographical

Florida Department of Transportation

Comment:

2. The natural condition loads presented in Table 8 of the modeling report are different from the TMDL loads (natural condition) presented in Table 9 of the modeling report. Both tables in the modeling report are different from the natural condition loads presented in the TMDL report.

Response:

The table has been corrected to be consistent between the two reports.

Comment:

3. Figure 1 in the modeling report shows WBID 3154, Fort Drum Creek, not Sawgrass lake.

Response:

This has been corrected in the final version of the document.

Comment:

1. The TMDL determinations shown in the TMDL report and the modeling report are different.

Response:

The TMDL determination in the TMDL document is correct. The table in the modeling report has been corrected.

WBIDS: 1536F & 1536B Six Mile

General

Florida Department of Transportation

Comment:

1. As there is already a published TMDL that prescribes the load reductions needed for the Palm River Tidal and McKay Bay, this TMDL is redundant and actually is an a priori allocation of how load reductions will be achieved to meet the Palm River Tidal and McKay Bay TMDL. This TMDL assumes that load reductions needed to meet the TMDL in the downstream waters will be evenly distributed between the watershed upstream of the S-160 structure and the watershed draining to the system downstream. This is especially a problem in the upper WBID 1536B.

Response:

EPA expects when these TMDLs are implemented that the plan will take into account both TMDLs. This will insure that both WBIDs will be protected and meet its designated use.

Comment:

4. The TMDL needs to recognize that if the downstream TMDL is modified or the waterbody classification of the downstream waterbody is modified, then this TMDL no longer applies.

Response:

EPA does acknowledge if water quality standards or waterbody classifications change in the future this TMDL can be reconsidered.

Source and Load Assessment

Florida Department of Transportation

Comment:

8. No discussion of groundwater as a source to these WBIDs is provided in the discussion of hydrology even though earlier it was identified that the dredging of the canal broke into the aquifer. That this is a significant component of the system baseflow.

Response:

The watershed model was parameterized using groundwater concentrations that were documented in the water management districts reports.

Comment:

6. The report only provides the measured flows at S-160 but data are available for S-161, S-162, and S-159 as well as for the withdrawals from the system. These measured flows and the withdrawals are all key components of the hydrologic conditions in the system and should be discussed.

Response:

The watershed model was calibrated to uncontrolled structures and then forced with measured flow from the structures.

Endpoints/Water Quality Targets

Florida Department of Transportation

Comment:

3. Section 4.2 outlines the Dissolved Oxygen Criteria. As EPA was willing to acknowledge the ERC-approved Florida Nutrient Criteria, the Agency should also acknowledge that the DO standard for Florida waters is currently under revision. A discussion of the potential impact of this revision on these proposed TMDLs should be

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Comment:

2. In Section 4.1.2 the document states Florida's recently adopted rule applies to streams, including Six Mile Creek/Tampa Bypass Canal. Based upon the stipulations outlined by the Environmental Regulation Commission (ERC), Six Mile Creek/Tampa Bypass Canal would be considered a "conveyance" and, as such, the Florida criteria would not be applicable. Additionally, this section discusses doing a Stream Condition Index (SCI) test. It would not be appropriate to do an SCI test in a canal system such as Six Mile Creek/Tampa Bypass Canal.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

1. The document states: Should federally promulgated criteria become effective for CWA purposes before this proposed TMDL is established, EPA will consider the impact of those criteria on the targets selected for this TMDL. The document should also state that if revised criteria become effective after this TMDL is established, the TMDL will be re-evaluated to determine the impacts of the revised criteria on the targets selected for the TMDL.

Response:

EPA agrees with this statement. If different criteria become effective for Clean Water Act purposes, FDEP could revisit this TMDL.

Comment:

3. The original Palm River and McKay Bay TMDL is based upon meeting the present DO criteria in Florida. At present, Florida is in the process of developing and approving revised DO criteria. While it is recognized that these criteria have not received final approval at this time, Florida Department of Environmental Protection (FDEP) acknowledged that the current DO standards are not appropriate, which led to the development of the new proposed DO criteria. Given this position regarding the DO standards, the determination that the system would not meet the DO criteria even under natural loadings may not reflect the "best science" as defined by the U.S. Environmental Protection Agency (EPA) and FDEP and may be inappropriate for defining load reductions.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Watershed Model

Florida Department of Transportation

Comment:

2. The prescribed load reductions are based upon a Loading Simulation Program in C++ (LSPC) model simulation of the natural condition. While this is a common practice in TMDL development, there are no assurances that the model is accurately projecting the natural background loads. It would be useful to do some comparisons of what the natural load is with more pristine waterbodies so that some determination can be made of how realistic the natural condition loads are.

Response:

EPA relies on the natural condition scenario to determine if all applicable water quality standards can be met when there are no anthropogenic sources. EPA realizes to parameterize a watershed to a natural condition requires some assumptions. EPA Region 4 has been using this methodology to develop nutrient TMDLs for over 8 years. While the methodology is not perfect, it does use best available information and technical approach to determine whether a particular water quality standard could ever be met. This methodology has been improved through the years based upon feedback from stakeholders and FDEP. Florida regulations will not allow the abatement of a natural condition; this determination is needed to determine the maximum load reduction that would have to occur without reducing to below natural conditions.

TMDL Determination

Florida Department of Transportation

Comment:

4. WBID 1536F

•Figure 6 presents DO saturation values but the text does not reference the figure although it does discuss DO saturation

•In the text at the bottom of page 12, it references Figure 7 as if Figure 7 presents vertically averaged DO values. Figure 7 actually presents measured DO levels at different depths at the middle station, which had the least number of measurements overall. It would have actually been useful to have a figure of vertically averaged data.

•WBID averages of total nitrogen (TN) are 0.83 milligrams per liter (mg/L). These are low numbers for freshwater systems in the area. The numeric nutrient criteria (NNC) for freshwater systems is 1.65 mg/L. Given that the NNC is based upon biologically healthy systems, including DO, a 79 percent reduction in TN does not make sense.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

5. WBID 1536B

•The stations are located in some very different places in the system. It would be good in the analyses to provide some longitudinal assessments to show if DO conditions are similar at all locations. This could be assessed using the data from the 21FLBRA 1536-A, 21FLBRA 1536-B and 21FLBRA 1536-C stations, which were taken on the same days.

•It should be acknowledged that the predominance of the data were taken at the Environmental Protection Commission of Hillsborough County (EPC) monitoring station 146, which is upstream of Structure 159 (S-159), and that data may not be representative of conditions below S-159. The analyses should at least separate the data into those measured above S-159 and those measured below as these are potentially two separate and differently behaving waterbodies.

•As was identified for WBID 1536F, TN levels are low in relation to the regional NNC. Given that the NNC is based upon biologically healthy systems, including DO, a 79 percent reduction in TN does not make sense.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

9. It looks like the percent reductions identified (TN=79 percent, TP=77 percent) are inconsistent and, in fact, larger than the percent reductions prescribed in the TMDL for Palm River and McKay Bay. Please explain this apparent inconsistency.

Response:

The natural condition model scenario that was used to determine the Palm River/McKay Bay TMDL is the same watershed model and drainage area used to determine this TMDL. Therefore, the difference in loading between the existing and natural condition run would be identical.

Typographical

Florida Department of Transportation

Comment:

7. Figure 21 should be modified to include both of the WBIDs of interest for this TMDL. The figure presently only shows WBID 1536F, needs to add WBID 1536B and remove downstream WBIDs not part of this TMDL.

Response:

This modification has been made.

Duplicate Submittal

Michael J. Williams

Comment:

EPA received the same comments from Florida Department of Transportation on this TMDL proposal. See responses to FDOT.

Response:

WBID: 2411 Sixmile Creek

Endpoints/Water Quality Targets

Florida Department of Transportation

Comment:

9. Nutrient reductions are proposed in order to meet the requirement that DO be at least 5.0 mg/L at all times, including normal daily and seasonal fluctuations. The IWR allows for waters to be de-listed if the impairment is determined to be caused by a natural condition. In the absence of other evidence of impairment, this criterion is unreasonable for many of the streams in Florida. High summer temperatures combined with low flow conditions will result in DO values less than 5 mg/L even in pristine, healthy streams. The DO standard of 5 mg/L at all times is very likely to be unattainable in most streams in Florida.

Response:

The commenter previously stated that FDEP submitted a delisting request for dissolved oxygen for Sixmile Creek because it is believed to be a natural condition. EPA rejected this delisting request because of evidence of anthropogenic sources in the watershed. The development of the TMDL indicates a difference in dissolved oxygen between the existing and natural conditions. Therefore, EPA has concluded that anthropogenic sources are causing a depression in dissolved oxygen.

EPA does acknowledge that FDEP has begun the process of changing their dissolved oxygen criteria. However, while they draw the conclusion that their current dissolved oxygen criteria is not appropriate; it is protective and currently applicable criterion for Clean Water Act purposes.

Comment:

5. The data for these waterbodies do not confirm that there is a nutrient problem that would lead to low DO.

Targeting nutrients to increase DO is not an effective strategy if there is no problem with nutrients to begin with.

Response:

EPA has determined in this TMDL that nutrients and carbon loading from anthropogenic sources is causing a depression in dissolved oxygen. EPA does state that the applicable water quality standard for dissolved oxygen in not met under a natural condition. A site specific alternative criteria or a revised dissolved oxygen standard could allow this TMDL to be revisited.

Comment:

10. The IWR allows for a percentage of the DO measurements to fall below the standard of 5 mg/L before a waterbody is verified as impaired for DO. Yet once a waterbody is on the verified list, the methodology used to develop the TMDL, no matter how flawed or uncertain, must ensure zero violations of the standard. This conflict between the verification process and the TMDL process results in targets that are not reasonable and quite probably unattainable.

Response:

When EPA approved the Impaired Waters Rule (IWR), it agreed with the assessment methodology of the binomial test for impairment. That assessment methodology does not, however, change the frequency component of Florida's water quality standards. Rather, as set out more fully in EPA's 2008 determination following the agency's review of the 2007 amendments to the IWR and associated documents, the binomial test does not establish a new frequency component allowing ambient waters to exceed criteria 10% of the time. Rather, the binomial test uses a probability value of 10%, which serves as a data

reliability provision related to the number of samples necessary to conclude that criteria have been exceeded in the waterbody as a whole. Similarly, Florida's dissolved oxygen water quality standard does not allow an exceedance frequency, thus the TMDL scenario cannot allow an exceedance.

EPA determined that while under a natural conditions the dissolved oxygen criteria is not met. There is a difference in predicted dissolved oxygen concentrations between the current and natural condition scenarios which indicates anthropogenic sources are causing a depression in dissolved oxygen.

Comment:

11. The DO standard for Florida waters is currently under revision. A discussion of the potential impact of this revision on these proposed TMDLs should be included.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Comment:

2. At present, Florida is in the process of developing and approving revised DO criteria. While it is recognized that these criteria have not received final approval at this time, Florida Department of Environmental Protection (FDEP) acknowledged that the current DO standards are not appropriate, which led to the development of the new proposed DO criteria. Given this position regarding the DO standards, the determination that the system would not meet the DO criteria even under natural loadings may not reflect the "best science" as defined by EPA and FDEP and may be inappropriate for defining load reductions.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Assessment

Florida Department of Transportation

Comment:

8. Chl a values are generally very low, with several samples reported as below the method detection limit. Annual geometric means between 2001 and 2010 range from 2.20 to 7.17 micrograms per liter (µg/L), with the highest values during the year generally occurring in June, July, and August. The annual geometric mean in 2011 was 29.98 µg/L, which exceeds FDEP's Chl a threshold of 20 µg/L for streams but is not sufficient to verify the water as impaired for nutrients under the Impaired Waters Rule (IWR) because two years out of three consecutive years is required. It is also noted that the sample location is close to the mainstem of the St. Johns River, so water quality measured in the creek could be influenced by what is going on in the mainstem. A follow-up sample in March 2012 shows a low Chl a in the creek of 1 µg/L. Additional consideration should be given to the potential influence of the mainstem on water quality in the creek.

Response:

EPA agrees that chlorophyll a values are low. Chlorophyll a was not the response variable that was used in the development of this TMDL to set reductions in nutrients. The TMDL endpoint was the dissolved oxygen concentration. The influence of the Lower St. Johns River was considered in the TMDL development.

Comment:

7. Between 2001 and 2011, annual geometric mean values for total phosphorus (TP) range from 0.072 mg/L to 0.13 mg/L, with just one year exceeding the NNC of 0.12 mg/L for peninsular streams. This one year exceedance is not sufficient to deem this waterbody impaired for nutrients. Given that the FDEP NNC are based upon biologically healthy systems, including DO, a 71 percent reduction in TP does not make sense.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

EPA does understand that "biologically healthy" streams and rivers is an indication that the waterbody is at least partially meeting designated uses. There are other indices that are measured and compared to Florida's water quality standards which if not met the waterbody is determined to be impaired. In the case of this TMDL the dissolved oxygen criterion is not met.

Comment:

6. Between 2001 and 2011, annual geometric mean values for total nitrogen (TN) range from 0.94 mg/L to 1.22 mg/L. This range is well below the numeric nutrient criteria (NNC) for peninsular streams of 1.54 mg/L. Given that the FDEP NNC are based upon biologically healthy systems, including DO, a 41 percent reduction in TN does not make sense.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

EPA does understand that "biologically healthy" streams and rivers is an indication that the waterbody is at least partially meeting designated uses. There are other indices that are measured and compared to Florida's water quality standards which if not met the waterbody is determined to be impaired. In the case of this TMDL the dissolved oxygen criterion is not met.

Comment:

5. The discussion of biochemical oxygen demand (BOD) range and average value is misleading. Of the 104 BOD samples collected between 2001 and 2011, 68 samples were below the method detection limit (MDL). In all but one sample, the MDL was 2.0 mg/L. In the other sample, the MDL was 0.2 mg/L. The median value of BOD when all of the values below method detection limit are removed, but values less than practical quantitative limit are included, is 1.4 mg/L. FDEP's threshold above which it is considered that BOD may be causing DO impairment is 2.0 mg/L, so the recommended 59 percent reduction in BOD does not make sense.

Response:

The percent reduction that is calculated is the difference in loadings between the current and natural condition scenario. EPA does agree there was not much BOD data in which to calibrate the model, but did rely on the best available information.

Comment:

4. FDEP proposed Sixmile Creek for de-listing for DO because the waterbody was determined to have low DO due to a natural condition (Category 4c). Wetland drainage

was given as the probable cause for the low DO. EPA rejected this proposal. Sixmile Creek will remain on the 303(d) list as a Category 4d, i.e., impaired for DO but a causative pollutant cannot be determined. Since no pollutant can be identified, it is not appropriate to propose a TMDL targeting a specific pollutant.

Response:

EPA rejection of the de-listing request is substantiated by the development of this TMDL. If the dissolved oxygen in Sixmile Creek was a natural condition, the predicted dissolved oxygen concentrations for the natural and existing condition scenario would virtually be the same. A review of the surrounding watershed is not indicative a natural condition.

Comment:

3. Sixmile Creek was determined by FDEP during the Cycle 2 assessments to be not impaired for nutrients using both the Chlorophyll a (Chl a) and historic Chl a tests.

Response:

Sixmile Creek is listed for both nutrients and dissolved oxygen. FDEP placed the WBIDs in category 3B because of insufficient information to develop a causative pollutant. Because these WBIDs are not de-listed, EPA is required to develop a TMDL under the conditions of the consent decree.

Comment:

1. The plots of water quality data are too busy and very difficult to read.

Response:

These plots are provided to give a glimpse of the measured data that is available for both assessment and TMDL developments. For detailed review of the data in the Impaired Waters Rule database it can be obtained from the administrative record of this TMDL or from the Florida Department of Environmental Protection.

Comment:

We also noted that the Florida Department of Environmental Protection (FDEP) delisted Sixmile Creek for nutrients in its Cycle 1 assessment. During the FDEP's Cycle 2 assessment, the median concentrations of total nitrogen (1.032 mg/L), total phosphorus (0.089 mg/L), and biochemical oxygen demand (2 mg/L) were all below screening levels that would link these pollutants to a dissolved-oxygen impairment.

Response:

Sixmile Creek is listed for both nutrients and dissolved oxygen. FDEP placed the WBIDs in category 3B because of insufficient information to develop a causative pollutant. Because these WBIDs are not de-listed, EPA is required to develop a TMDL under the conditions of the consent decree.

Comment:

Existing TMDLs on the Lower St. Johns River and Mill Creek adequately address anthropogenic nutrient loads entering Sixmile Creek.

Response:

When these TMDLs are fully implemented, it could be documented that Sixmile Creek would be meeting its TMDL.

Analytical Approach

Florida Department of Transportation

Comment:

4. Detailed citations of reports used to identify model input parameters are not provided.

Response:

The citations for the event mean concentrations are:

A. Harper, H.H. 2011. New Updates to the Florida Runoff Concentration (EMC) Database.

Environmental Research & Design, Inc.

B. Harper, H.H. and D.M.Baker. 2007. Evaluation of Current Stormwater Design Criteria within theState of Florida. Final Report prepared for Florida Department of Environmental Protection.Environmental Research & Design, Inc. Orlando, FL.

C. Reiss, K.C., Evans, J., and M.Brown. 2009. Summary of Available Literature on NutrientConcentrations and Hydrology for Florida Isolated Wetlands. Final Report prepared for Florida Department of Environmental Protection. University of Florida, Gainesville, FL.

The citation for the St. Johns River Water Management District's HSPF study is:

The document will be updated with the appropriate citation.

St Johns River Water Management District, 2012. St John River Water Supply Impact Study.Technical Publication SJ2012-1. SJRWMD, Palatka, FL

Comment:

1. The TMDL loads are all based on the LSPC model simulation of the natural condition. While this is a common practice in TMDL development, there are no assurances that the methodology used to convert to natural conditions is accurately representing the natural background loads.

Response:

EPA relies on the natural condition scenario to determine if all applicable water quality standards can be met when there are no anthropogenic sources. EPA realizes to parameterize a watershed to a natural condition requires some assumptions. EPA Region 4 has been using this methodology to develop nutrient TMDLs for over 8 years. While the methodology is not perfect, it does use best available information and technical approach to determine whether a particular water quality standard could ever be met. This methodology has been improved through the years based upon feedback from stakeholders and FDEP. Florida regulations will not allow the abatement of a natural condition; this determination is needed to determine the maximum load reduction that would have to occur without reducing to below natural conditions.

Comment:

3. Model inputs are not explained and justified adequately. A much more detailed model report with explanations for and justifications of model input parameters, calibrations, and results should be provided. In addition, a sensitivity analysis of model parameters should be provided.

Response:

Model Parameterization

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Model Sensitivity

EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as a set of conditions are needed for calculating a TMDL.

Watershed Model

Florida Department of Transportation

Comment:

20. Conversion to the "natural condition" is done by converting all "anthropogenic" land uses to upland forest and wetlands, assuming 50 percent conversion to each. What justification is there for assuming that 50 percent of current anthropogenic land uses would be wetland in their natural state? This is important because the EMC values for BOD, total nitrogen (TN) and total phosphorus (TP) used for wetlands are higher than for upland forest resulting in an artificially high "natural" load. The wetland BOD EMC, for example, is 2.6 mg/L, while upland forest is 1.4 mg/L. Since the entire TMDL is premised on the fact that the DO standard cannot be met under natural conditions and very substantial reductions are required, the TMDL and model reports require a much more detailed explanation and justification of the development of the natural condition.

Response:

EPA relies on the natural condition scenario to determine if all applicable water quality standards can be met when there are no anthropogenic sources. EPA realizes to parameterize a watershed to a natural condition requires some assumptions. EPA Region 4 has been using this methodology to develop nutrient TMDLs for over 8 years. While the

methodology is not perfect, it does use best available information and technical approach to determine whether a particular water quality standard could ever be met. This methodology has been improved through the years based upon feedback from stakeholders and FDEP. Florida regulations will not allow the abatement of a natural condition; this determination is needed to determine the maximum load reduction that would have to occur without reducing to below natural conditions.

Comment:

22. Section 6.2.5 of the TMDL report states "Water and wetlands have very low event mean concentrations down to zero…." which confirms that the water and wetlands EMCs used in the model are probably too high.

Response:

EPA does agree that wetlands can assimilate nutrient loadings from upstream/watershed segments, wetlands also have nutrients loads associated with them when it rains.

Comment:

23. All wetlands in the model are assumed to generate additional nutrient load. While it is true that there can be a net nutrient load associated with some wetlands, jurisdictional wetlands that receive discharges from upland areas and then ultimately discharge to the waterbody are actually providing water quality treatment for the "pass-through" flows. Assigning an additional load to the wetland on top of an untreated load from the inflows to the wetland results in an overestimate of total loads.

Response:

EPA does agree that wetlands can assimilate nutrient loadings from upstream/watershed segments, wetlands also have nutrients loads associated with them when it rains.

Comment:

13. It does not appear that the LSPC model incorporates use of Best Management Practices (BMP) in the loading calculations for the developed/urban areas. Published EMC values generally apply to untreated runoff, so by not including any allowance for in place BMPs, the existing loads are most likely being significantly overestimated. A discussion of the application of BMPs should be included in the model report.

Response:

EPA developed the watershed model using the best available information and calibrated to current conditions (which would include any previous BMPs in the basin).

Comment:

12. Based on review of the LSPC input files EPA provided, the model uses constant event mean concentration (EMC) values to define loads (i.e., the build-up/wash-off methodology is not used). The EMC values used are not presented in the model report, nor is there any literature citation or documentation of how the EMCs were derived.

Please include a table of EMC values for each land use in the model report and references as to their source.

Response:

EMC Citations

A. Harper, H.H. 2011. New Updates to the Florida Runoff Concentration (EMC) Database. Environmental Research & Design, Inc.

B. Harper, H.H. and D.M. Baker. 2007. Evaluation of Current Stormwater Design Criteria within the State of Florida. Final Report prepared for Florida Department of Environmental Protection. Environmental Research & Design, Inc. Orlando, FL.

C. Reiss, K.C., Evans, J., and M. Brown. 2009. Summary of Available Literature on Nutrient Concentrations and Hydrology for Florida Isolated Wetlands. Final Report prepared for Florida Department of Environmental Protection. University of Florida, Gainesville, FL.

Water Quality Model

Florida Department of Transportation

Comment:

17. On Page 13, the last sentence of the first paragraph reads "It is during these periods of times that nutrients are expressed." The meaning of this statement is not clear and cannot be deduced from the rest of the paragraph.

Response:

This has been clarified in the final document.

Comment:

19. The model does a poor job of predicting TN, TP, DO, and Chl a, particularly the appropriate ranges and trends, as shown in the following figures.

Response:

EPA used the best available information to calibrate the watershed and water quality model. Unfortunately, there is not much monitoring data available for Sixmile Creek.

Clearly more data would aid in judging the performance of the model.

Comment:

18. The model report does not include any information on the values of the kinetic parameters used in the WASP water quality model. In addition to the values used, the model report should provide the source and/or justification for kinetic rates that are used.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area

being modeled.

Comment:

16. Model calibration is confirmed by comparing measured average over the calibration period with modeled average over the calibration period. The calibration should really be looking at the range and trend of measured values versus the range and trend of computed values. In many cases, the range and trend of the measured values are poorly represented by the range and trend of calibrated values. A discussion of the statistics presented should be included to justify the conclusion that the model is adequately calibrated.

Response:

EPA uses the best available information available to calibrate the watershed and water quality models. EPA does review the calibration to make sure that it represents the range and trends of the data. Because the model(s) provide output 4 times a day for 11 years there are a lot more predictions that measurements. Furthermore, the model is predicting water quality through a large range of meteorological conditions then what is typically measured in the field.

Comment:

27. The modeled natural condition includes extended periods of zero to very low DO, in some cases more than two months (see following figure). As flow records indicate that this is an intermittent stream, do these anoxic episodes correlate with periods of low to no flow conditions? This should be investigated as a check on calibration and to ensure that this does not represent model instabilities.

Response:

EPA does agree the lowest dissolved oxygen concentrations occur during low flow. The predicted low dissolved oxygen concentrations during low flow are not model instability, EPA routinely conducts mass balance checks on all model scenarios.

Comment:

26. Information provided in the model report on the model input parameters and the model calibration is insufficient to allow for a substantive review of the methodologies used to arrive at the proposed TMDL. Complete information about the model input should be provided in the model report for the calibration and for all scenarios modeled. Justifications for parameter input values should be included. Until sufficient information is provided to allow for a meaningful review of the model and results, this TMDL should not be finalized.

Response:

EPA Region 4 makes all of the model(s), model input(s) and data that are used to develop a TMDL available to the public upon request. The modeling tools that are used are engineering tools that allow EPA to make informed decisions when determining a TMDL. These tools are very complex and to document every feature, parameter, constant or data point that is used in the model(s) would be very difficult. All of the modeling tools are publically available and include a very detailed user's manual that provides a description of

the input and how it is used in the model. Initial model constants are set to typical values from like areas where the model has been applied in the past. During the calibration process it is not uncommon to change several constants to better represent the current area being modeled.

Comment:

24. The modeling report state that "Sediment oxygen demand [SOD] is reduced based upon the percent reduction in nutrient loads" for conversion to the "natural condition." More information on both the SOD value under current condition and the assumed SOD value under the natural condition is needed. Actual values input into the model should be included in the report.

Response:

When EPA develops the natural condition run, the SOD rate that is used in the natural condition model is attenuated based upon the magnitude of change in the loadings. EPA has developed an SOD response curve which relates changes in expected SOD as a function in the change in loads using a spreadsheet version of Dominic DiToro's sediment diagenesis model.

Comment:

14. Much of the BOD data used in the calibration are reported below detection of 2.0 mg/L. (T code = Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.) A model cannot be calibrated against values that are below detection.

In addition, FDEP's criterion for BOD potentially causing DO impairment is 2.0 mg/L. It does not make sense that this TMDL recommends a 59 percent reduction in BOD.

Response:

The percent reduction that is calculated is the difference in loadings between the current and natural condition scenario. EPA does agree there was not much BOD data in which to calibrate the model, but did rely on the best available information.

Comment:

15. The modeling report should include some discussion of the meaning of the statistics presented and whether or not the statistics indicate a well-calibrated model.

Response:

EPA's goal in presenting calibration plots and statistics is to provide the public both a quantitative and qualitative view of the models performance. Given the amount of monitoring data that is available for any given WBID it is very difficult to define and rate model performance on a set of criteria.

Comment:

25. The modeling report should include a sensitivity analysis of the major model input parameters, e.g., SOD, in order to gain a clearer understanding of exactly what is driving the model results and calibration.

Response:

EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as a set of conditions are needed for calculating a TMDL.

Comment:

Considering how well our model results fit the flows and loads at the primary monitoring station, and given the sizeable differences between our results and those in EPA's current models, it is difficult to see how EPA's current models could have compared favorably to the data from the primary monitoring station on Sixmile Creek. More documentation on the calibration efforts and results from EPA's modeling efforts would be helpful to us in determining why the two modeling efforts vary so greatly from each other.

Response:

EPA has never seen or reviewed the St. Johns County mechanistic model so cannot respond to the first part of this comment. EPA has provided St. Johns County's consultant with all of our models well before this TMDL was proposed. EPA received no feedback from the county.

Comment:

In addition to the mechanistic modeling efforts, we developed empirical models using the available water-quality-sampling data. Our empirical modeling results indicate that dissolved oxygen concentrations do not appear to be related to nutrient concentrations but do appear to be related to total organic carbon in the water column. It is critical that any mechanistic modeling reflect the conceptual model (i.e., the connection of low dissolved oxygen to total organic carbon) established through the empirical modeling efforts.

Response:

The mechanistic model that was used to develop this TMDL is a carbon based model and does take into account the impact of total organic carbon on dissolved oxygen.

Typographical

Florida Department of Transportation

Comment:

2. Figure 6 has the incorrect DO standard shown.

Response:

This has been corrected in the final version of the document.

Duplicate Submittal

H.P. Tompkins

Comment:

Our mechanistic and empirical modeling demonstrate that there is no statistically-significant relationship between nutrients and dissolved-oxygen concentrations in Sixmile Creek and that the low-dissolved-oxygen events are a result of naturally-occurring organic carbon.

Response:

Comment noted. The mechanistic model that was applied in the development of the TMDL indicates that both nutrients and carbon loading under the current condition causes a depression in dissolved oxygen in Sixmile Creek.

WBID: 1683 Smacks Bayou

Endpoints/Water Quality Targets

Florida Department of Transportation

Comment:

5. At present, Florida is in the process of developing and approving revised DO criteria. While it is recognized that these criteria have not received final approval at this time, FDEP acknowledged that the current DO standards are not appropriate, which has led to the development of new, proposed DO criteria. Given this position regarding the DO standards, the determination that the system would not meet the DO criteria even with significant reductions in TN, TP, and BOD loads may not reflect the "best science" and may be inappropriate for defining load reductions.

Response:

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

1. The appropriate DO standard for the estuarine WBID is as follows: not less than 5.0 milligrams per liter (mg/L) for a 24-hour period, with a minimum of four samples collected during the 24-hour period, and never less than 4.0 mg/L. The TMDL document

states "The TMLD reduction scenarios will be done to achieve a Florida's dissolved oxygen concentration of 5 mg/L…" (pg 7) (EPA, 2012a).

Response:

This sentence has been revised to reflect that the TMDL reduction scenarios will done to achieve the average daily concentration of 5 mg/L.

Assessment

Florida Department of Transportation

Comment:

2. The Smacks Bayou WBID 1683 should not be listed as impaired. DO data from the heads of the two canals, at 54th Ave. (21FLPDEM34-01, 21FLTPA 27491648238041) and at 45th Ave. (21FLPDEM42-01, 21FLTPA 27484848238033) are not representative of the WBID. The canals deliver stormwater to the Bayou from their watersheds, with the upstream ends of the canals, where the water quality data are collected, representative of the water quality entering the stormwater conveyance system for transport to the bayou proper. The canals are functioning appropriately as Best Management Practices (BMPs), allowing for treatment of the stormwater before it enters the Bayou proper. The 54th Ave. canal is heavily shaded by mangroves and difficult to navigate, with snags and overhanging vegetation, providing opportunity for settling of particulates and filtering of nutrients from the stormwater. Likewise, the 45th Ave. canal, while easily navigable, provides a long travel distance to the bayou proper. Additionally, a silt/trash barrier has been in place in the 45th Ave. canal just downstream of the delivery point of the watershed runoff. Water quality sampling by Pinellas County at this station is performed upstream of the barrier. Utilizing the data from the canal stations sampling is not warranted when examining the status of Smacks Bayou, but is more appropriate for an examination of the stormwater influent to the Smacks Bayou system prior to the water quality treatment provided by the approximately 1500-meter-long canals. Excluding the DO data from these canal stations results in less than 10 percent of the observations being less than 4 mg/L. As presented in time series of modeled and observed DO at 21FLPDEM32-01 and 21FLPDEM32-03 (Figures 7.7 and 7.8 of the TMDL document), the modeled DO at these sites very rarely dropped below 4 mg/L. As noted by Florida Department of Environmental Protection (FDEP) staff in June 2011, and communicated to EPA, FDEP agreed that it was justified to no longer pursue doing nutrient or dissolved oxygen TMLDs for the Smacks Bayou WBID.

Response:

EPA acknowledges that the canals are functioning as BMPs and treating stormwater prior to entering Smacks Bayou. Currently, these stations are used in the analysis to determine the status of water quality in Smacks Bayou, and removing these stations results in approximately 10 percent of the DO observations being less than 4 mg/L, which violates the current DO water quality criteria. Due to the violations, the TMDL must be established pursuant to the schedule of EPA's commitments in the 1998 Consent Decree in the Florida TMDL lawsuit (Florida Wildlife Federation, et al. v. Carol Browner, et al., Civil Action No. 4: 98CV356-WS, 1998). However, the TMDL may be revised if different

water quality standards are adopted, or if additional data or information becomes available.

Analytical Approach

Florida Department of Transportation

Comment:

3. EPA uses a series of complex watershed and receiving water models to assess the DO responses to nutrient and organic carbon [biochemical oxygen demand (BOD)] loads. Based upon a detailed review of the documents presented and other documents describing the models developed for the Florida NNC effort (utilized for this TMDL development), some technical issues were raised relative to the adequacy of the models' calibration and the sufficiency of the documentation to provide assurance that the models are adequately simulating the key processes impacting the end results. No documentation is provided for the Tampa Bay Watershed or EFCD models in the EPA NNC documents (EPA, 2012b,c), so no assessment of the calibration status of these large models is possible.

For the models utilized in the TMDL proposal, some model development details are not provided, some key model-to-data comparisons are not provided, some methods of model application are not reasonable, and some of the calibration/validation results presented bring the model into question. Sufficient information is not provided to indicate that the model suite is appropriately calibrated to determine that a 73 percent reduction in total nitrogen (TN) loads, a 94 percent reduction in total phosphorus (TP) loads, and a 57 percent reduction in BOD loads would result in DO conditions corresponding to natural conditions.

Response:

The larger Tamps Bay Watershed modeling reports are available on www.regulations.gov and can be found under the Florida Numeric Nutrient Criteria Technical Support Documents, Appendix C: Watershed Hydrology and Water Quality Modeling Report for Florida Watersheds and Appendix D: Hydrodynamic and Water Quality Modeling Report for Nutrient Criteria for Florida Estuary Systems, and their associated attachments. EPA believes that the modeling report was sufficient to describe the TMDL analysis. The TMDL report includes calibration results for hydrodynamic and water quality results from the EFDC and WASP models used to develop the Smacks Bayou TMDL. The natural condition scenario also shows that reducing nutrients in Smacks Bayou would result in an increase in DO concentrations.

Comment:

1. Why was only the mechanistic modeling approach utilized? Why were empirical/statistical methods not used to evaluate the existing data to determine if there were utilizable relationships between loadings and DO in Smacks Bayou? Loadings development has been completed for the entire Tampa Bay watershed for 1985-2011 by the Tampa Bay Estuary Program, and WBID-specific loads are available.

Response:

Mechanistic modeling was utilized because it allowed EPA to run numerous scenarios when needed for TMDL development. The calibration of the model to a data collected at

different stations during different years. Additionally, it can be difficult to find meaningful relationships between nutrient loadings and DO, particularly in Florida's streams and rivers. This is due to the complexity of nutrient cycling in natural waterbodies, which results in variable time lags between the introduction of nutrients and their uptake and use by algae or other aquatic plants. Nutrients may be stored in sediment and/or organic materials and eventually re-introduced to the water column. Less available forms of nutrients such as organics must be broken down before they can be recycled for uptake. Other considerations include the fact that measuring chlorophyll concentrations in a water sample only provides a "snapshot" of the concentrations at the time and place the sample was taken, and the measurement only captures phytoplankton, the free-floating algae, and will not capture other types such as attached algae (periphyton), algae growing on bottom sediments (benthic), and other aquatic plants (macrophytes). Mechanistic models allowed for the simulation of these complex systems over space and time.

Watershed Model

Florida Department of Transportation

Comment:

6. Similarly, no information is provided regarding the calibration of the water quality portion of the LSPC model for the Tampa Bay Watershed, so that no assessment of the parameterization is possible.

Response:

The larger Tamps Bay Watershed modeling reports are available on www.regulations.gov and can be found under the Florida Numeric Nutrient Criteria Technical Support Documents, Appendix C: Watershed Hydrology and Water Quality Modeling Report for Florida Watersheds and Appendix D: Hydrodynamic and Water Quality Modeling Report for Nutrient Criteria for Florida Estuary Systems, and their associated attachments.

Comment:

5. The proposed TMDL document notes that the Smacks Bayou watershed model was parameterized based on the Tampa Bay Watershed model, which was calibrated from continuous flow U.S. Geological Survey (USGS) gages. This calibration information is not provided here nor in the EPA (2012b) document, so that no assessment of this parameterization is possible.

Response:

The larger Tamps Bay Watershed modeling reports are available on www.regulations.gov and can be found under the Florida Numeric Nutrient Criteria Technical Support Documents, Appendix C: Watershed Hydrology and Water Quality Modeling Report for Florida Watersheds and Appendix D: Hydrodynamic and Water Quality Modeling Report for Nutrient Criteria for Florida Estuary Systems, and their associated attachments. The Smacks Bayou Watershed model and its parameterization was available for review via the administrative record.

Comment:

4. The LSPC model utilized data inputs from the Tampa Bay Watershed model

developed for the Florida NNC effort (EPA, 2012b), although this specific watershed model was not utilized or described in the EPA (2012b) document. No calibration information was presented for the Tampa Bay Watershed model, from which input data were used for the Smacks Bayou watershed model.

Response:

Data utilized to create the Tampa Bay Watershed model was provided in Section 7.1 Mechanistic Models. Detailed information about data inputs and calibration of the larger Tampa model were available on www.recreation.gov, as referenced in the TMDL report. Sample calibration results from similar watersheds from the larger Tampa model have been provided included in the Smack Bayou TMDL.

Comment:

7. Why were no comparisons or statistical values provided for any calibration metrics available for water quality within the proposed TMDL report (EPA, 2012a) and the larger Tampa Bay Watershed model?

Response:

EPA routinely provides graphical comparison of models, which are sufficient for determine the capabilities of models in representing the measured trends of the waterbody. A presentation of the statistical comparisons, which are also often subjective to definitions regarding sufficient calibration, would not aid in TMDL development. However, for the larger Tampa Watershed model, both graphical and evaluative metric were provided in the referenced Technical Support Document.

Comment:

4. The TMDL loads are all based upon the LSPC model simulation of the natural condition. While this is a common practice in TMDL development, there are no assurances that the model is accurately projecting the natural background loads. It would be useful to do some comparisons of what the natural load is with more pristine waterbodies so that some determination can be made of how realistic the natural condition loads are. It would be useful to perform a more rigorous calibration effort of the watershed and waterbody models, providing sufficient calibration metric comparisons to allow for a degree of confidence in the models' responses to inputs under current conditions prior to asserting that the model responds appropriately to natural conditions.

Response:

EPA acknowledges that it is common practice to use LSPC model simulations of natural conditions to determine background loading. Unfortunately, in the Tampa Bay watershed in the areas with similar geographic location, soils, and elevations are all highly developed and there are no immediate areas with available data that can be utilized for such a scenario. The model parameters, which were from the larger Tampa model used for the Florida Numeric Nutrient Criteria, were reviewed by multiple groups, including several offices within the EPA and by the Florida Department of Environmental Protection. These parameters reflect an intensive and rigorous calibration effort of the model.

Water Quality Model

Florida Department of Transportation

Comment:

15. No quantitative calibration metrics were provided for the comparison of measured and observed DO, so that the capability of the model to simulated observed conditions is not supported.

Response:

EPA routinely provides graphical comparison of models, which are sufficient for determine the capabilities of models in representing the measured trends of the waterbody. A presentation of the statistical comparisons, which are also often subjective to definitions regarding sufficient calibration, would not aid in TMDL development.

Comment:

18. Without quantitative measures assuring that the calibration is sufficient to simulate observed responses to observed forcing functions, any additional scenarios involving changes to loadings are not convincing as appropriate potential TMDLs.

Response:

EPA routinely provides graphical comparison of models, which are sufficient for determine the capabilities of models in representing the measured trends of the waterbody. A presentation of the statistical comparisons, which are also often subjective to definitions regarding sufficient calibration, would not aid in TMDL development. The graphical results presented in the TMDL are within range of the measured results and represent the water quality and hydrodynamcic trends present in the model, indicating that the model calibration is sufficient for determining TMDL load reductions.

Comment:

16. Similarly, no quantitative calibration metrics were provided for the TN, TP, or Chl a comparison plots of modeled and observed data within the model domain.

Response:

EPA routinely provides graphical comparison of models, which are sufficient for determine the capabilities of models in representing the measured trends of the waterbody. A presentation of the statistical comparisons, which are also often subjective to definitions regarding sufficient calibration, would not aid in TMDL development.

Comment:

14. It is unclear how the relatively coarse resolution WASP and EFDC model grid cells are appropriate representations of Smacks Bayou. As provided in Figure 7-2 of the proposed TMDL document, the cells are very wide and provide wide openings for exchanges between the Bayou and Tampa Bay and between the different portions of the Bayou itself. Without appropriate representation of the physiography of the Bayou, even given appropriate loadings from the watershed, it is unlikely that either salinity or nutrient and DO concentrations can be simulated successfully.

Response:

EPA disagrees that the current resolution of the WASP and EFDC grid cells is too coarse. The model allows for the representation of the hydrodynamic circulation within the Bay, as evident by the salinity and temperature calibration. The current opening of Smacks Bayou represents the actual opening into Tampa Bay. All water quality parameters were successfully simulated.

Comment:

13. No mention is made of atmospheric deposition of TN and TP loads directly to the surface of Smacks Bayou. Atmospheric deposition loads in the Tampa Bay area have been shown to be a significant percentage (25 to 40 percent) of the total loading to Tampa Bay and are likely important considerations when developing the loadings for the WASP model domain in this WBID.

Response:

Atmospheric deposition loads were included in the Smacks Bayou model. The loads nitrate, ammonia, and orthophosphate loads were input as constants into the model.

Comment:

12. It is noted in the proposed TMDL report that the water quality parameters from the Tampa Bay WASP7 model were used to populate the Smacks Bayou WASP7 model. No presentation of the Tampa Bay WASP7 model calibration is provided either here or in EPA 2012c, making it impossible to determine if this parameter set is appropriate.

Response:

The Tampa Bay WASP7 parameterization was used as the initial parameterization for the Smack Bayou calibration. Parameterization was changed as necessary to improve the calibration of Smacks Bayou, which is presented in the TMDL report. The Smacks Bayou model and its parameterization was available for review as part of the administrative record.

Comment:

10. The only salinity calibration information presented for the hydrodynamic model was for modeled and observed salinity at 21FLPDEM32-01, which only has data through 2002. Why were no other comparisons provided? Station 21FLPDEM32-03 has salinity from 2008 onward and is located near the Bayou's midpoint, so would be a better test of the calibration of the model. No distribution comparison of simulated and observed salinity is provided with quantitative statistics to support the contention that the model is calibrated.

Response:

This was an error in the original TMDL report. Station 21FLPDEM32-01 was presented twice, instead of station Station 21FLPDEM32-03 being presented. This has been corrected in the final TMDL report. EPA routinely provides graphical comparison of models, which are sufficient for determine the capabilities of models in representing the measured trends of the waterbody. A presentation of the statistical comparisons, which are also often subjective to definitions regarding sufficient calibration, would not aid in TMDL development.

Comment:

9. The model grid did not incorporate any representation of the approximately 1500-meter-long stormwater treatment canals delivering the primary loads to the Bayou. This results in the loss of the treatment of watershed loadings that occurs in these canals before the loadings reach the Bayou proper. Instead, the upstream inland cell of the model domain received all the watershed loadings input.

Response:

The model grid represented Smacks Bayou proper and did not include the above mention stormwater canals. The estuary model calibration of nutrients represents trends in the model, which indicates that the watershed loading model did take into account any current BMPs in place within the contributing area.

Comment:

2. When developing the natural condition scenarios, EPA reduced sediment oxygen demand (SOD) from the existing condition by the same fraction as Chlorophyll a (Chl a) was reduced compared to the existing condition. No justification is provided for this methodology. It should be recalled that in many systems in the Tampa Bay area, SOD likely results from more than just Chl a, with many systems subjected to inputs of other organic materials that impact SOD.

Response:

EPA agrees that SOD changes based on input of organic materials. The methodology to reduce SOD in the natural condition run uses a Chl a ratio, but Chl a is influenced by the nutrient loading contributions entering Smack Bayou. The methodology to reduce SOD is commonly utilized by the Florida Department of Environmental Protection, and as also been used by the Army Corps of Engineers and has been supported in papers and reports, including Steven Chapra's Surface Water-Quality Modeling.

Comment:

8. The Tampa Bay EFDC model created for Florida NNC was utilized for the boundary conditions for the Smacks Bayou model. However, no presentation of the Tampa Bay EFDC model was provided in the Technical Support Document (TSD) (EPA, 2012c), so that the appropriateness of this model and associated parameter set for use in TMDL evaluation cannot be determined.

Response:

The Tampa Bay EFDC model was calibrated to multiple locations within Tampa Bay. Results of the calibration were presented in the Technical Support Document for the Florida Numeric Nutrient Criteria which is available on www.regulations.gov.

Comment:

11. Additional salinity data within the model domain in Tampa Bay are available from various monitoring programs and would be useful for supporting model calibration. Utilization of all the available data for quantitative calibration comparison is warranted in support of the contention that the model is simulating observed responses to observed

forcing functions.

Response:

The salinity calibration plot for station 21FLPDEM32-03 has been provided and included in the final report, which includes comparison of measured and modeled salinity data in 2008 and 2009

Comment:

17. No sensitivity analyses were provided for changes in nutrient supplies (TN, TP), BOD, or SOD. This information should be obtained after the model is appropriately calibrated, to determine the important drivers of DO dynamics in the system and allow focused effort on effective management.

Response:

EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as a set of conditions are needed for calculating a TMDL.

TMDL Determination

Florida Department of Transportation

Comment:

3. Why were no nutrient load reduction scenarios completed to evaluate different combinations of reductions?

Given the nitrogen limitation common in the region, it may well be that the model would show that only the TN load would need to be reduced. Similarly, what were the relative impacts of reducing TN, TP, and BOD loads? A sensitivity analysis to these loads would be very helpful.

Response:

The EPA TMDL loads were calculated to ensure protective values of DO in accordance with the natural condition water quality using the definition of natural background. By reducing all nutrient loads, EPA ensures that DO is protected. EPA routinely performs sensitivity analysis during the calibration process. What is presented in the modeling report and/or in the development of the TMDL is the best calibration to all observed data at all stations. A presentation of the sensitivity of model predictions to changes in constants and kinetics would not help in determining a TMDL as a set of conditions are needed for calculating a TMDL.

Duplicate Submittal

Thomas Gibson

Comment:

EPA received the same comments from Florida Department of Transportation on this TMDL proposal. See responses to FDOT.

Response:

WBID: 1512Z Wall Spring

General

Florida Department of Transportation

Comment:

11. DO is typically low in spring discharge, as groundwater has not been in contact with the atmosphere for a period. Many springs in the region have DO concentrations of less than 2 mg/L, as does Wall Spring (Scott et al., 2004). A more defensible reason to set a TMDL for Wall Spring would be to lower nitrogen levels to protect downstream estuarine resources. The spring run of Wall Spring flows directly into an estuary embayment (Boggy Bayou), which flows into St. Joseph Sound, an Outstanding Florida Water.

Response:

EPA agrees that it is important to reduce nutrients in Wall Spring to protect downstream water bodies, including the St. Joseph Sound. Reducing nutrients, specifically NOx, will improve water quality in downstream estuaries.

Comment:

2. WBID 1512Z is delineated as an arbitrary circle and does not correspond to a drainage area (Figure 1). Wall Spring has no direct surface water runoff contributing to its discharge since the spring boil is surrounded by a concrete wall. All water discharged from the spring originates in the underlying aquifers. Water from the surface may have elevated nitrogen levels from fertilizer, septage, atmospheric deposition, or other sources.

Response:

EPA acknowledges that the source of water for Wall Spring originates in the underlying aquifer whose recharge is may include numerous sources which cannot be verified. These sources will need to be identified during the implementation phase of the TMDL.

Source and Load Assessment

Florida Department of Transportation

Comment:

3. High-nitrite water entering the aquifer may be from a source that is close by or distant. The extent of the area contributing water to Wall Spring's discharge is unknown (EPA, 2012). The spring is hydrologically connected to the confined Floridian aquifer system underlying the region and likely the shallow aquifer as well (ERD, 2010). It is also

likely that surface water from the nearby golf course, including reclaimed water from the adjacent treatment plant, contributes to high NOx in Wall Springs (EPA, 2012). The results of an isotope analysis of surface water and groundwater conducted for Pinellas County indicated that reuse water discharged at the golf course has a significant impact on nitrogen levels in the spring discharge (ERD, 2010).

Additionally, other groundwater sampling has shown NOx levels in wells in the vicinity of the nearby reclaimed water facility to be over the Department of Health recommended limit of 10 mg/L (FDEP, 2008). These issues are mentioned by EPA (2012) but there is no guidance on how to implement the 93 percent NOx concentration reduction. EPA states that the extent of land that contributes water to the springs is unknown.

Response:

EPA has indeed mentioned these issues in the TMDL and did not provide guidance on how to implement the reduction. These issues need to be addressed during the Basin Management Action Plan, as stated in Section 9.0 Recommendations/Implementation.

Comment:

13. Also, it must be recognized that groundwater moves slowly, relative to surface water, so even if nitrogen sources were reduced by 93 percent, it would take years for reduced NOx concentrations to be observed in the spring discharge.

Response:

EPA acknowledges that it may take years for NOx to be reduced in Wall Spring following implementation of a Basin Management Action Plan.

Endpoints/Water Quality Targets

Florida Department of Transportation

Comment:

10. Although lowering the nutrient load is intended to establish conditions that allow DO levels to increase, an analysis of water quality data by EPA (2012) found no statistically significant relationship between DO and either NOx or TP concentrations.

Response:

The TMDL acknowledges that there was statistically significant relationship between DO and either NOx or TP concentrations, and this was described in Section 7.0 of the TMDL:

"Dissolved oxygen data for Wall Spring was available after 1995. Nutrient concentration data was available beginning in 1978, and nitrate-nitrite concentrations were already greater than six mg/L at that time. Total phosphorus concentrations were approximately 0.05 mg/L in the late 1970s and early 1980s. Presumably, by 1995, there was already a shift in the aquatic biology in Wall Spring because of the 20 year history of elevated

nutrients, which is why a trend between DO and NO3NO2 or TP could not be established. The FDEP evaluated nutrient trends throughout the state of Florida and found that the average nitrate concentration increased from 0.2 mg/L to 1.0 mg/L over the past 50 years (FDEP 2009), further indicating that the increase in nutrients in Wall Spring occurred prior to the 1978 sampling."

Comment:

1. EPA developed the proposed TMDL to reduce nitrogen loading to Wall Spring for the purpose of lowering algal growth rates and raising chronically low DO levels. The proposed TMDL was developed by comparing current (2002 - 2010) NOx concentrations with the concentration determined by FDEP to be protective of spring ecosystems (EPA, 2012). This criterion is a single value that is applied statewide.

Response:

Limited data exists both in Wall Spring and throughout the state of Florida regarding appropriate nutrient concentrations in tidal springs. The NOx concentration found to be protective by FDEP was done after reviewing literature throughout the state of Florida, and represented the best analysis, which was supported in the TMDL:

"After an extensive literature review, FDEP determined that reducing nitrate-nitrite to 0.35 mg/L should return spring ecosystem back to their balanced states (FDEP 2009). Multiple studies have shown that reducing NO2NO3 concentration in springs can reduce algal growth (Stevenson et al 2007; Niu and Gao 2007; Pinowska et al. 2007). Field surveys indicated that NO3NO2 needed to be reduced to 0.454 mg/L to reduce excessive algal growth, while laboratory results have shown NO3NO2 should be reduced to 0.230 mg/L to prevent excessive algal growth."

Assessment

Florida Department of Transportation

Comment:

12. It is intended that reduced nutrient loading would result in reduced algal growth in the spring. Although not stated in the TMDL document (EPA, 2012), nuisance algal mats have been reported in Wall Spring in the current FDEP Verified List of Impaired Water Bodies. It should be noted that although TN concentrations in the spring are quite high (averaging 5.01 mg/L during the verified period), chlorophyll a levels were low, averaging only 1.02 µg/L during the period.

Response:

EPA acknowledges that nuisance algal mats have been reported in Wall Spring in the current FDEP Verified List. Limited chl-a data was collected in Wall Spring during the TMDL analysis period, and was only collected in 2004. Collection in this one year time period may not be representative of chl-a level throughout the entire period.

TMDL Determination

Florida Department of Transportation

Comment:

14. There are no direct MS4 discharges to Wall Spring, so there should not be any assigned WLA in the TMDL. All reductions should be included in the LA.

Response:

The MS4 permit FLS000005 covers the immediate area located within WBID 1512Z. Additionally, the recharge area of Wall Spring is likely located in the nearby adjacent area, which would also include FLS000005. For this reason, the MS4 is assigned the same percent reduction as the LA. There is no WLA in the TMDL.

Comment:

5. Based on a comparison of current NOx concentrations and the state standard, a reduction of 93 percent in the concentration would be required to meet the proposed TMDL.

Response:

The comment is acknowledged, this is the current percent reduction in the TMDL.

Comment:

8. To establish the required load reduction for the proposed TMDL, EPA (2012) estimated the annual total nitrogen (TN) load from Wall Spring. From 2000 through 2009, the average NOx concentration was 4.92 mg/L. An average flow of 4.2 million gallons per day (MGD) discharges from the spring (Pinellas County Parks and Preserves, 1993), and the average annual NOx load was estimated to be approximately 62,810 pounds per year (lb/yr), or 28,550 kilograms per year (kg/yr). If the spring discharge NOx concentration was reduced 93 percent to the FDEP water quality standard of 0.35 mg/L, the annual NOx load would be approximately 4,470 lb/year (2,031 kg/year).

Response:

The TMDL does state that a 93 percent reduction in the NOx load would result in an annual load of 2,031 kg/yr.

Comment:

6. There are no direct municipal separate storm sewer system (MS4) discharges to Wall Spring, so there should not be any assigned WLA in the TMDL. All reductions should be included in the LA.

Response:

The MS4 permit FLS000005 covers the immediate area located within WBID 1512Z. Additionally, the recharge area of Wall Spring is likely located in the nearby adjacent area, which would also include FLS000005. For this reason, the MS4 is assigned the same percent reduction as the LA. There is no WLA in the TMDL.

Comment:

4. Reducing NOx concentrations was intended to result in raising DO levels in the spring discharge. However, an analysis of water quality data by EPA (2012) found no statistically significant relationship between DO and either NOx or total phosphorus (TP) concentrations. It should be noted that groundwater is naturally low in DO, so the low concentrations were likely at least partially due to normal conditions. NOx was found to have a statistically significant and proportional relationship with TP, so a reduction in nitrogen would likely be accompanied by lowering of TP loads as well.

Response:

EPA acknowledges that low DO is often naturally occurring.

Comment:

9. Using a concentration reduction percent to set a load reduction percent assumes a 1:1 correspondence between loads and concentrations with respect to their effects on the response variable. This correspondence has not been demonstrated by EPA (2012).

Response:

The EPA cites several literature examples documenting that reductions in NOx protects springs and returns their ecosystems to balance states (FDEP 2009, Stevenson et al 2007; Niu and Gao 2007; Pinowska et al. 2007). The 1:1 correspondence presented in the TMDL is a result of reducing the average NOx concentration from 4.92 mg/L to 0.35 mg/L and assuming the same discharge from the spring.

Comment:

7. The proposed TMDL was established by comparing the 2002 - 2010 NOx concentrations in Wall Spring discharge (mean of 4.92 mg/L) to the recently adopted FDEP NNC value of 0.35 mg/L. This value has been determined by FDEP through a literature review to be protective of spring ecosystems. To reach the criterion, NOx concentrations would have to be reduced by 93 percent.

Response:

The TMDL does require a 93 percent reduction of NOx to meet the FDEP NNC value of 0.35 mg/L.

Duplicate Submittal

Pinellas County

Comment:

This is a duplicate comment. See response to FDOT comments

Response:

WBID: 3075 Wolf Creek

Endpoints/Water Quality Targets

James B. Payne

Comment:

With regard to TN and TP for Wolf Creek, the proposal shows the existing levels to be below the numeric criteria offered by EPA. This is why the State DEP delisted this water body and supports the conclusion that the water body is not impaired.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint was determined to be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

Comment:

The existing TN and TP are less than the proposed criteria. As with Wolf Creek, these creeks do not always attain the criterion for DO because the DO criterion is highly problematic and is presently being adjusted by the State to reflect real Florida conditions and values. A TMDL should not be implemented until realistic and protective values for DO are finalized in Florida.

Response:

Please see EPA's general response to comments received regarding the impacts on this TMDL of ongoing activities to establish numeric nutrient criteria in Florida. Because the waterbody was on the Florida's CWA section 303(d) list for nutrients and dissolved oxygen, EPA was required to consider the impacts of nutrients on dissolved oxygen, pursuant to paragraph 62-302.530(47)(a), F.A.C. The basis for this TMDL is the nutrient endpoint which implements paragraph 62-302.530(47)(a), as that endpoint determined to

be more stringent than the level of nutrients that may be necessary to prevent an imbalance of flora and fauna pursuant to paragraph 62-302.530(47)(b).

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(C) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Comment:

On the Summary Sheet and on page 9 of the proposed TMDL for Wolf Creek, it states that Wolf Creek was listed on the 1998 303(d) list for DO and Nutrients. The proposal fails to recognize that in 2005 the State of Florida delisted Wolf Creek and Jane Green Creek for nutrients.

Response:

EPA agrees the State of Florida did de-listed Wolf and Jane Green Creek for nutrients, however it remained on the 303(d) list for dissolved oxygen. This TMDL determined that anthropogenic sources of nutrients and BOD need to be set to natural background conditions to insure no anthropogenic loadings are causing or contributing to depression of the dissolved oxygen concentration.

Comment:

Contrary to what the proposed TMDL for Wolf Creek states as it discusses DO concentration under natural conditions, the DO Concentration Time Series in Figure 13 shows concentrations will be above 5.0 much more frequently than they will be below 5.0. It is true that there will be times when the concentration will be less than 5.0, but that is normal in Florida for this type of stream. To have DO always and in every condition meet 5.0 is unobtainable and unrealistic and unnatural. In light of the fact that the State is presently revising it criteria for DO, no TMDL should be finalized until that process concludes.

Response:

This TMDL was developed to currently applicable water quality standards for Clean Water Act purposes. The current water quality standard for dissolved oxygen for a Class III freshwater system is no less than 5 mg/L.

EPA does acknowledge that Florida has begun the process of changing their dissolved oxygen criteria. Until this process is completed and approved by EPA pursuant to section 303(c) of the CWA, the current water quality standard for dissolved oxygen is effective for Clean Water Act purposes.

If and when Florida changes their water quality standard for dissolved oxygen, this TMDL could be re-visited in the future.

Watershed Model

James B. Payne

Comment:

On page 8 of the Model Report for Wolf Creek it appears that Fort Drum rainfall data was used in the model instead of rainfall data from a source closer to the WBID. It is not clear if the model was calibrated to Fort Drum rainfall or to something else. If the amount of rainfall is incorrect then the EMCs would be incorrect and the current condition loading and natural condition loading will be incorrect.

Response:

The Fort Drum rain gage was used for the development of the Wolf Creek TMDL. EPA relied on meteorological stations that had complete records for the simulation period.

TMDL Determination

James B. Payne

Comment:

On page 18 of the Model Report the conclusion is incorrectly made that the maximum load must be equal to the modeled load under natural conditions. There is no evidence that the stream will not meet the State's narrative standards. In fact, the stream was delisted by FDEP with regard to nutrients confirming that even under current conditions, let alone modeled natural conditions, that the narrative standard was being met. The TMDL as proposed for Wolf Creek should not be finalized for the reasons set out above.

Response:

The waterbody is not currently meeting its designated use because it is not meeting all applicable water quality standards. In the case of this TMDL the dissolved oxygen criteria is not met.

Typographical

James B. Payne

Comment:

On page 11 and 12 of the proposed TMDL for Wolf Creek both the chart and dialog regarding BOD appear to be wrong.

Response:

The figure and data summary are correct.