September 1st, 2010

Water Docket
U.S. Environmental Protection Agency
Mail code: 2822T
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Attention: Docket ID No. EPA-HQ-OW-2009-0596.

Re: The Environmental Protection Agency’s Supplemental Notice of Data Availability and Request for Comment, dated August 3, 2010, related to Numeric Nutrient Criteria

To Whom it May Concern:

Thank you for the continued coordination of the United States Environmental Protection Agency’s (EPA)’s efforts on the Proposed Water Quality Standards for the State of Florida’s Lakes and Flowing Waters. Pinellas County is committed to working with EPA and the Florida Department of Environmental Protection (FDEP) to develop water quality standards that are in support of its water quality improvement efforts of the last 40 years.
EPA requested comment on three main topics:

1) **The revision of stream nutrient region boundaries that are based on additional information about watershed delineations and phosphorus-rich geological formations in Florida.**

**Response:**
Placing Pinellas County within the Peninsula Region (Map 1) ignores two crucial elements of its soil composition.

First, the Soil Survey of Pinellas County describes a phosphatic Hawthorn layer underlying much of the county (Map 2). This is further documented in Whitmore et. al. (1995), which states that Lake Seminole in Pinellas County is underlain by a phosphatic Hawthorn layer. The West Central region was delineated based on inherent differences in natural factors that contribute to higher nutrient concentrations in its streams (phosphate rich soils, geology, and hydrology). Pinellas County’s soil composition should similarly be taken into account to accurately reflect regional differences.

Second, urbanized regions face non-natural factors that contribute to higher nutrient concentrations in their stream regions (altered soils, geology and hydrology). These factors should be considered in developing nutrient criteria. The Peninsula Region is a large heterogeneous region in terms of soils, geology and hydrology. Further sub-division is reasonable to realistically reflect the highly altered conditions in urbanized areas.
Map 2 - Generalized geologic map showing location of cross sections in Pinellas County
In summary, the nutrient regions are too broadly defined and should be narrowed to account for regional variability. This would alleviate the need for costly Site Specific Alternative Criteria (SSAC) development. The County recommends that EPA continue to develop and identify distinct subregions within the current approach as data become available to provide greater resolution of nutrient watershed regions. An approach that groups water bodies that have distinct differences in water quality relationships does little to meaningfully determine true water body impairment. This can result in the use of limited financial resources to alleviate perceived water quality problems that may not in fact be a problem.

2) The continued consideration of deriving river/stream criteria by using the 75th percentile of total nitrogen (TN) and total phosphorus (TP) concentrations from sites with healthy biological conditions (original EPA proposed approach), but also consideration of an alternative approach that would base the criteria for streams on the 90th percentile of concentration values (75th in the West Central) of minimally disturbed sites (original FDEP proposed benchmark stream approach).

<table>
<thead>
<tr>
<th>Proposed Option based on the 75th Percentile Concentrations from Biologically Healthy Sites (mg/L)</th>
<th>Proposed Option based on the 90th Percentile (75th in West Central) Concentrations from Minimally Disturbed Sites (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Phosphorus</td>
<td>Total Nitrogen</td>
</tr>
<tr>
<td>Panhandle West</td>
<td>0.03</td>
</tr>
<tr>
<td>Panhandle East</td>
<td>0.10</td>
</tr>
<tr>
<td>North Central</td>
<td>0.36</td>
</tr>
<tr>
<td>Peninsula</td>
<td>0.10</td>
</tr>
<tr>
<td>West Central</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Response:
As stated, Pinellas County’s geology is characterized by a phosphatic Hawthorn layer that contributes to the phosphorous loading to the region lakes and streams. If Pinellas County remains in the Peninsula Region, it will be facing nearly 100% impairment based on proposed nutrient criteria for either 75th percentile SCI healthy sites or 90th percentile SCI minimally disturbed sites. Furthermore, the criteria do not take into account the intense urbanization effect on stream nutrient concentrations. Man-made or highly altered systems cannot be compared to minimally disturbed systems and cannot be restored to those conditions. Pinellas County’s geology and urban landscape warrant a more scientifically based regional classification.

Overall, the EPA proposal is overly simplistic. FDEP’s extensive efforts led to the conclusion that stream water quality is complex and dependent on many variables. The data showed significant variability in nitrogen and phosphorus concentrations in the minimally disturbed streams without any response in the stream biology. If the connection between nutrients and biology cannot be established, EPA’s proposal for streams could shift focus away from meaningful water quality improvement projects and programs. As a local government, we have a duty to spend public funding wisely and to assure our leadership and the public that we are
striving towards appropriate goals that protect all aspects of our aquatic resources in a fiscally responsible manner.

3) The application of additional river/stream criteria for the protection of downstream lakes, known as “Downstream Protection Values” (DPVs), based upon:

a) Using the BATHTUB model in place of the Vollenweider equation for deriving both TP and TN criteria

Response:
There are several issues with the use of the BATHTUB model:

- The documentation accompanying the BATHTUB model presented in Walker’s Applications Report (https://swrrp.usace.army.mil/_swrrp/swrrp/4-Pubs/WaterQualityRpts/T.R.-E-81-9%20rep%204.pdf) clearly indicates that this model was developed for the study of reservoirs. Reservoirs are commonly described as man-made public water supply sources, and typically involve impounding a river valley. This is not applicable to most Florida lakes.

- The BATHTUB model requires input data that is largely unavailable statewide including continuous flow records, vertical water quality profiles, water influx and nutrient loads from all tributaries and lake morphology among others. Furthermore, in many areas of Florida, groundwater inputs are a significant contributor to the lake nutrient load and this model does not address inputs from groundwater.

- In several studies, the BATHTUB model was found to be less than applicable in complex systems (Lim, 2001 and Gaddis et al, 2010). Additionally, Lim states that the developed BATHTUB models for studied reservoirs are subject to verification due to lack of actual nutrient load data and variations in year-to-year hydrologic conditions.

- Furthermore, Wang et al. (2005) showed in their study of reservoirs in the central plains that the BATHTUB model’s seasonal simulation resulted in significant discrepancies between the predicted and observed values for TN and TP. In this study, both TN and TP were under predicted, indicating that the seasonal simulation might not be appropriate for modeling the eutrophication conditions of the study Lake.

- Wang et al also cites that a major advantage of BATHTUB over other models is its use of simple steady-state calculations to address eutrophication processes. BATHTUB treats a reservoir component as a spatially-averaged control-volume segment with influxes and effluxes of volume and mass. Steady-state calculations however, do not take into account the assimilative capacity of waterbodies and do
not account for wind-driven sediment nutrient dynamics in shallow eutrophic systems.

- Ward and Benaman studied the applicability of various models to TMDL determinations in two separate 1999 documents. The first, focused on model screening, showed that the BATHTUB model was rejected for TMDL determinations due to a lack of applicable current uses. Most of the studies using the BATHTUB model were conducted in the Midwest United States. Another rejection criterion was its empirical nature when the authors recommended a more deterministic approach. The subsequent document by the same authors states that empirical models can be invalidated by any structural changes in the watershed, while a deterministic approach is better suited to determining cause-effect relationship within water quality parameters.

- Lastly, the California Watershed Assessment Manual’s review of the BATHTUB model states that “short-term responses, responses to variables other than nutrients and effects related to structural modifications cannot be explicitly evaluated.” (http://cwam.ucdavis.edu/pdfs/BATHTUB.pdf)

b) Allowing FDEP or EPA to use alternative models when adequate data are available

**Response:**

Allowing FDEP or EPA to use alternative models without consensus from the local stakeholders or adequate peer review is not an acceptable solution. Past and current model propositions by EPA staff have been less than satisfactory and there needs to be a system of check and balances in place to allow local stakeholders to examine what models will be used to establish Numeric Nutrient Criteria.

c) Where there is insufficient data for modeling, applying the lake criteria as the criteria for upstream waters.

**Response:**

Applying the lake criteria to upstream waters does not take into consideration the assimilative capacity of the lake and is therefore overprotective. This approach could lead to unrealistic stream load reductions at a significant cost to the public with no scientific demonstration that such low concentrations are warranted to be protective of the stream or the downstream receiving water. For example, the Lake Thonotosassa Surface Water Improvement and Management (SWIM) Plan which was developed after significant data collection and study determined that the appropriate Trophic State Index (TSI) for the lake was 60. The target for in-lake Total Nitrogen (TN) concentrations is 1.2 mg/L and the target for in-lake Total Phosphorous (TP) concentrations is 0.07 mg/L; however, after significant evaluation, it was determined that to achieve these in-lake targets tributary targets would be set at 2.4mg/L and 0.13mg/L for TN and TP respectfully.

In Summary:
Pinellas County’s position is that the proposed nutrient regions need further refinement to include the geological data presented in this report, as well as the consideration that urban areas face special challenges in nutrient concentrations due to altered geology and hydrology. Taking these considerations into account when evaluating regional characteristics will improve the numeric nutrient criteria development process.

The BATHTUB model may not be appropriate for Florida. Further evaluation is needed to determine appropriate methods for developing downstream protective values. It is not feasible that EPA will find a one-size fits all model to answer these questions. Additionally, downstream protection values should not be applied upstream due to lack of better alternatives. There needs to be strong science that ties water quality to a biological response in both the tributary and the receiving waters.

In conclusion, we are asking EPA to continue working with the state and local agencies to ensure that numeric nutrient criteria proposed for Florida will improve water quality, reflect our aquatic diversity, and result in effective and efficient expenditure of public funds.

Respectfully,

Kelli Hammer Levy
Division Director
Watershed Management Division

Encl.


Lim, Niang Choo (2001). Assessment of Reservoir Water Quality and its Application to Reservoir Management in the Central Plains.


Cc (Letter Only):
  William Davis, Director PCDEM
  Andrew Squires, Assistant Director, PCDEM
  David McCrea, Pinellas County Assistant County Attorney