Life with Numeric Nutrient Criteria

Getting to Hierarchy 1

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Florida DEP Rules

• Following EPA approval in November 2012, changes in Florida law by the 2013 legislature, and myriad litigation-related hurdles, FDEP rules still appear on track to implementation

• Context is numeric interpretation of the narrative nutrient standard, with reference numbers as default

• Requires confirmation by biological effect for a finding of impairment – cannot be done on the numbers only

• Intent is to implement new criteria for permittees at renewal

• Impaired Waters Rule review cycles continue

• Criteria are for water bodies, effectively averaged over the water body and over time – will have to translate into permit limits for dischargers

• Rules incorporate defined structures to establish site-specific criteria
Florida DEP Rules

62-302.531(2)(a), Florida Administrative Code:

1. The primary site specific interpretations are as follows:

   a. Total Maximum Daily Loads (TMDLs) adopted under Chapter 62-304, F.A.C., that interpret the narrative water quality criterion for nutrients in paragraph 62-302.530(47)(b), F.A.C., for one or more nutrients or nutrient response variables;

   b. Site specific alternative criteria (SSAC) for one or more nutrients or nutrient response variables as established under Rule 62-302.800, F.A.C.;

   c. Estuary-specific numeric interpretations of the narrative nutrient criterion established in Rule 62-302.532, F.A.C.; or

   d. Other site specific interpretations for one or more nutrients or nutrient response variables that are formally established by rule or final order by the Department, such as a Reasonable Assurance Demonstration pursuant to Rule 62-303.600, F.A.C., or Level II Water Quality Based Effluent Limitations (WQBEL) established pursuant to Rule 62-650.500, F.A.C.
Criteria will be established one of these ways:

- **Hierarchy 1**: Site-specific interpretations as TMDL, SSAC, WQBEL Level II, or other order of the Department

  *This is where you want to be*

- **Hierarchy 2**: Establishment of criteria based on “quantifiable cause-and-effect relationships”

  *Both EPA and DEP went to considerable expense to prove this is not possible*

- **Hierarchy 3**: Default to reference values by region

  *Nobody wants to go here*
Designing a Hierarchy 1 Study

- Engage DEP – District and Tallahassee – WMD, and local agencies – add NGOs if appropriate
- Identify the timeline
- Understand the waterbody
  - Physical setting
  - Available data
- Set the data collection network and parameters
- Pick the regulatory endpoint
- Convert results to criteria
Identify the Timeline

- DEP and EPA have expressed intent to implement for point sources at permit renewal
- SSAC requires 3 years of data
- Impaired Waters review cycles will continue, and permits typically have re-openers for impairment issues
- Statistical analysis will be improved with more data (usually)
Designing a Hierarchy 1 Study

Understand the Waterbody (WBID / Ecoregion / Basin / Data)
### Designing a Hierarchy 1 Study

#### Set the Network and the Parameters

<table>
<thead>
<tr>
<th>Water Quality Parameters</th>
<th>Biological Parameters</th>
<th>Location Description</th>
<th>Weekly Permit Monitoring</th>
<th>Monthly Water Quality</th>
<th>Quarterly Biological</th>
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<tr>
<td>Total Phosphorus</td>
<td>Stream Condition Index</td>
<td>Suwannee R above SR 6</td>
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<td>Ortho-Phosphorus</td>
<td>Rapid Periphyton Survey</td>
<td>Suwannee R above Swift Creek</td>
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<td>Total Nitrogen</td>
<td>Linear Vegetation Survey</td>
<td>Suwannee R below Swift Creek</td>
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<td>Total Kjeldahl Nitrogen</td>
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<td>NPDES Permit:</td>
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<td>Ammonia</td>
<td>Biological Integrity</td>
<td>Hunter Creek ~ ¾ mile W of CR 135</td>
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<td>Chronic &amp; Acute Toxicity</td>
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<td>Roaring Creek at CP 003</td>
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<td>Specific Conductivity</td>
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<td>pH</td>
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<td>Swift Creek at CR 25</td>
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<td>Total Suspended Solids</td>
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<td>BOD5</td>
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<td>Camp Branch at Trail</td>
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<td>Corrected Chlorophyll-a</td>
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</table>
Designing a Hierarchy 1 Study

Pick the Regulatory Endpoint

• TMDL
• SSAC
• WQBEL Level II
• Other order of the Department
Designing a Hierarchy 1 Study

Convert the Data to Criteria

• Rigorous statistical analysis
  Conversion to annual geometric mean not to be exceeded more than once in three years – may be outside the range found during the study period

• Potential use of models
  Particular consideration for downstream values

• Availability of mixing zones

• Assessment of representativeness of data during the study period
  Consideration of flow and water quality compared against historical data
Questions remain…

- Assessment of discharge values during the study compared to historical values and future expectations
- Application to systems including artificial waterbodies with naturally elevated TP, elevated chlorophyll-a, and different use expectations
- Translating Hierarchy 1 waterbody values to permit limits
- Effect of findings of non-impairment (e.g. “other order of the Dept.”)
- Criteria for intermittent discharges and/or discharges to intermittent streams or wetlands
- WBIDs that include both perennial and intermittent segments
- Determining biological health where rule-listed measures are not available (data gaps) or appropriate (flow characteristics do not allow for an SCI)
- Implementation in Outstanding Florida Waters
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