



Numeric Nutrient Criteria (NNC) Regulations

Ken Weaver

Florida Department of Environmental Protection



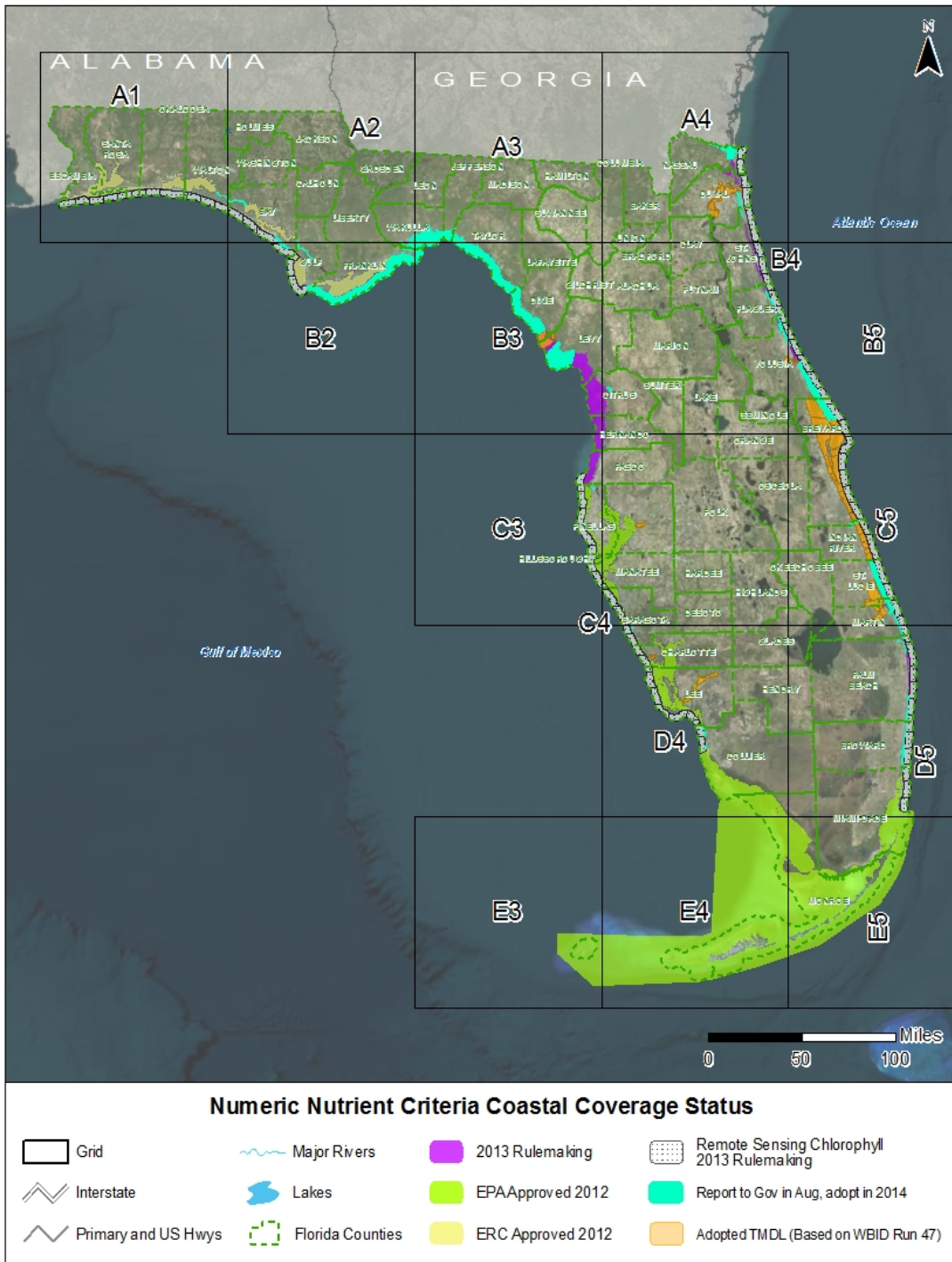
Background

- **Aug 2008- EarthJustice sued EPA over NNC**
- **Jan 2009- EPA “determines” NNC necessary**
- **Aug 2009- Settlement agreement between EPA and EJ**
- **Nov 2010- EPA promulgates NNC (streams, lakes, springs)**
- **Dec 2011 to present- EPA approved ALL DEP adopted criteria for streams, lakes, springs, and estuaries**
 - Path Forward legislation
- **Present- EPA requested modification of Consent Decree, waiting on Federal Judge Hinkle’s ruling**
- **Assuming favorable ruling, EPA will hopefully rescind their criteria and all DEP NNC could become effective over the next ~ 3-4 months**
 - EPA may request public comment, and may not rescind if their approval action is challenged by environmental community



NNC Adoption Status

- **DEP adopted NNC for streams, lakes, spring vents, and selected estuaries in Dec. 2011**
 - Estuaries covered ranged from Clearwater to Miami and the Florida Keys
 - EPA approved on November 30, 2012
 - Streams, Lakes, and Spring vent criteria are not currently in effect



**Estuary
Numeric
Nutrient
Criteria: DEP and
local scientists
developed
estuary-specific
nutrient standards**



NNC Adoption Status

Part 1 Estuaries

- Clearwater Harbor, Tampa Bay, Sarasota Bay, Charlotte Harbor, Caloosahatchee Estuary, Southwest Coast, Florida Bay, Florida Keys, and Biscayne Bay: **THESE ARE IN EFFECT!**

Part 2 Estuaries

- Perdido Bay, Pensacola Bay, Choctawhatchee Bay, St. Andrews Bay, St. Joseph Bay, and Apalachicola Bay: **THESE ARE IN EFFECT!**

Part 3 Estuaries

- Loxahatchee River, Lake Worth Lagoon, Halifax River, Guana River/Tolomato River/Matanzas River, Nassau River, Suwannee River, Waccasassa River, Withlacoochee River, Springs Coast, and Coastal Waters

Part 4 Estuaries

- Big Bend from Alligator Harbor to the Suwannee Sound, Cedar Key, St. Mary's, Southern Indian River Lagoon, several portions of the Intracoastal Waterway (ICWW) connecting estuarine systems, and a variety of small gaps



NNC Adoption Status (continued)

- Criteria for streams, lakes, springs, open coastal, and Part 3 and 4 estuaries are not currently in effect
- **Remaining NNC become effective only if EPA:**
 - ✓ – Approves these rules in their entirety,
 - Concludes rulemaking that removes federal numeric nutrient criteria in response to the approval, and
 - Determines, in accordance with 33 U.S.C. § 1313(c)(3), that these rules sufficiently address EPA's January 14, 2009 determination



Hierarchical Approach

Hierarchy 1 (Site-specific)

Level II Water Quality-Based Effluent Limitations,
Nutrient Total Maximum Daily Loads,
Site Specific Alternative Criteria,
Reasonable Assurance Plan,
Estuary-specific Criteria

Lakes/Springs



Cause -Effect Relationships (lakes & springs)

Streams



Reference-based thresholds (streams)
combined with biological data (flora and fauna)

Narrative



Ditches/canals used for water conveyance,
wetlands, non-perennial streams that have a dominance of wetland and/or
terrestrial taxa, tidally fluctuating areas,
South Florida flowing waters



Implementation Document

- To assist EPA's understanding of Florida's rules during the EPA approval process, DEP produced a document entitled, *Implementation of Florida's Numeric Nutrient Standards*
 - The "implementation" document basically describes how the adopted provisions for nutrients in Chapters 62-302, 62-303, and the SCI Primer work in conjunction
- EPA approved Implementation Document as a Water Quality Standard on June 27, 2013
- http://www.dep.state.fl.us/water/wqssp/nutrients/docs/nnc_implementation.pdf

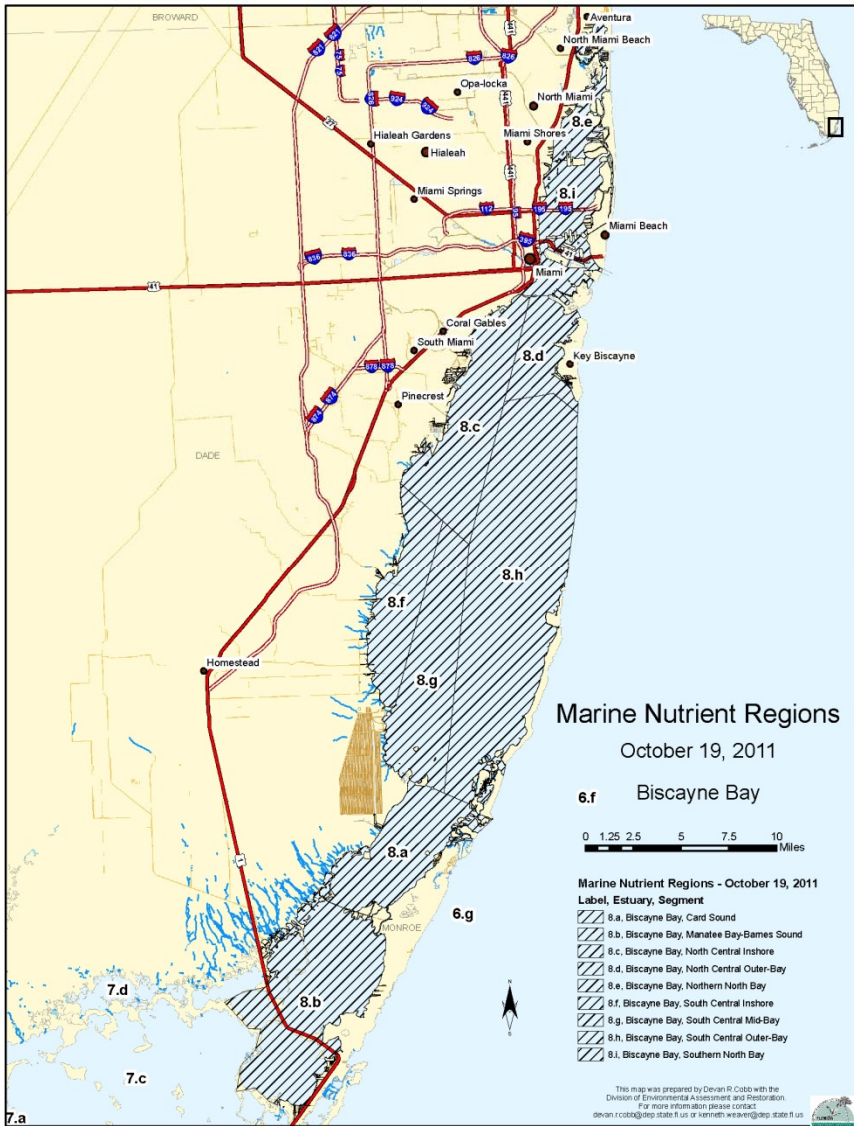


Hierarchy 1 Interpretations

- Estuary and Coastal Criteria
 - Rule 62-302.532, F.A.C.
 - Report to the Governor and Legislature
- State TMDLS, Level II WQBELS, Reasonable Assurance, and Site Specific Alternative Criteria
 - Must provide public notice that specifically states that the action constitutes a site specific interpretation of the narrative
 - Must be reviewed by EPA Region IV as a change to Water Quality Standards



Hierarchy 1-Estuaries



Estuary	Total Phosphorus	Total Nitrogen	Chl-a
(h) Biscayne Bay	Annual geometric means that shall not be exceeded more than once in a three year period.		
1. Card Sound	0.008 mg/L	0.33 mg/L	0.5 µg/L
2. Manatee Bay – Barnes Sound	0.007 mg/L	0.58 mg/L	0.4 µg/L
3. North Central Inshore	0.007 mg/L	0.31 mg/L	0.5 µg/L



Expression of Estuarine Interpretations of Narrative

- Annual geometric means, not to be exceeded more than once in a three-year period, or
- A single sample value not to be exceeded more than 10% of the time
- Criteria apply as average of open water segments
- However, permit limits expressed as the load (usually, current load) that ensures attainment of receiving water criteria during ALL years
- Criteria do not apply to tidal creeks
 - Tidal creeks are important, but distinct, ecological resource that need separate criteria



Hierarchy 1-Open Coastal



- Derived from satellite remote sensing techniques
- Expressed as annual geometric mean **remotely sensed chlorophyll *a*** values not be exceeded more than once in a three-year period
- Calculated excluding *Karenia brevis* blooms (>50,000 cells/L)

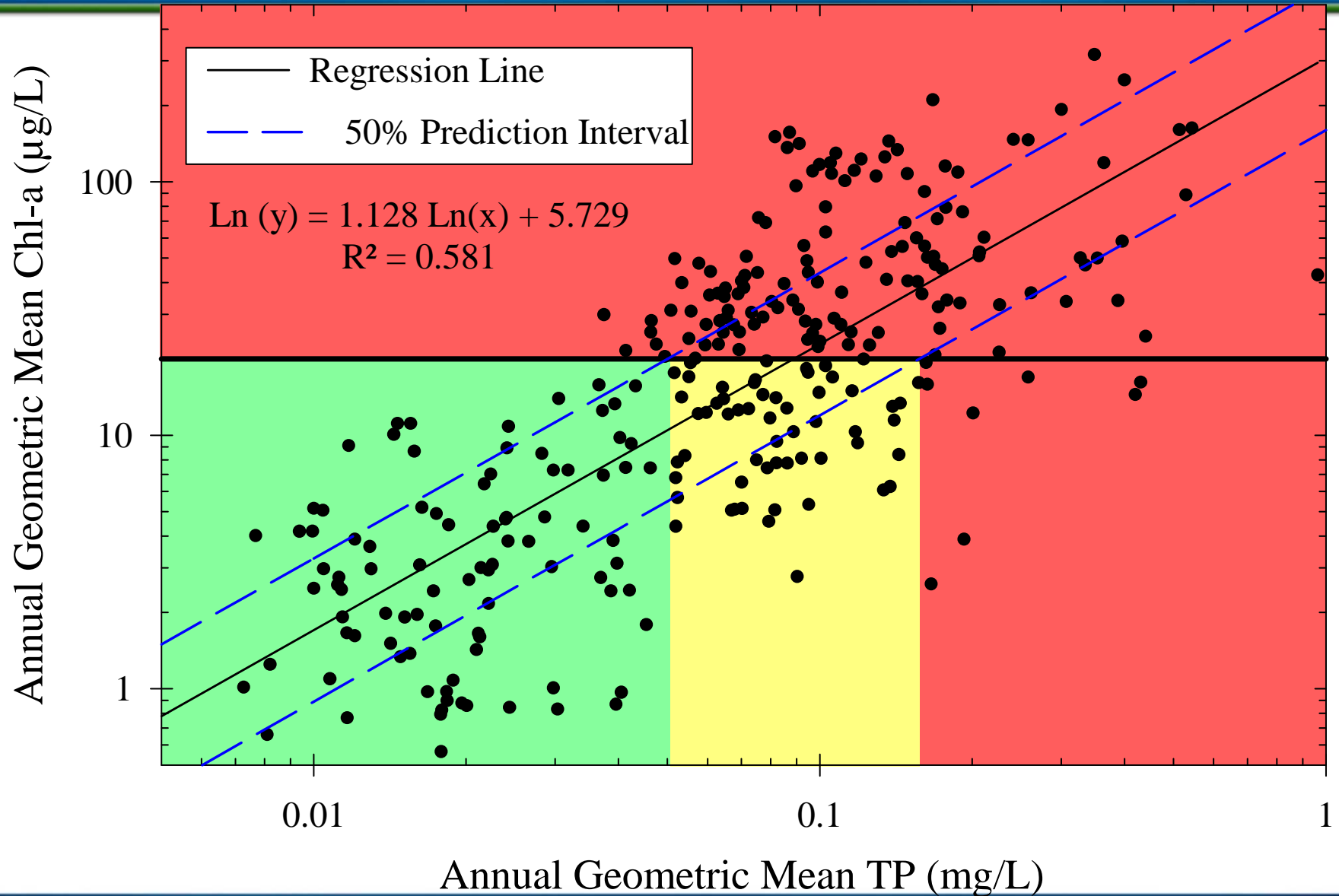


Numeric Interpretations for Lakes

- **Established chlorophyll a , TN and TP criteria**
 - Started with target chlorophyll a , and then set TN and TP criteria based on statistical relationship between nutrients and chlorophyll a
 - Criteria vary depending on color and alkalinity
 - Expressed as annual geometric means that is not to be exceeded more than once in a three-year period



TP vs. Chlorophyll: Colored Lakes





NNC for Lakes

Long Term Geometric Mean Lake Color and Alkalinity	Annual Geometric Mean Chlorophyll <i>a</i>	Minimum calculated numeric interpretation		Maximum calculated numeric interpretation	
		Annual Geometric Mean Total Phosphorus	Annual Geometric Mean Total Nitrogen	Annual Geometric Mean Total Phosphorus	Annual Geometric Mean Total Nitrogen
> 40 Platinum Cobalt Units	20 µg/L	0.05 mg/L	1.27 mg/L	0.16 mg/L¹	2.23 mg/L
≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO ₃	20 µg/L	0.03 mg/L	1.05 mg/L	0.09 mg/L	1.91 mg/L
≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO ₃	6 µg/L	0.01 mg/L	0.51 mg/L	0.03 mg/L	0.93 mg/L

¹ For lakes with color > 40 PCU in the West Central Region, the maximum TP limit is 0.49 mg/L



“Performance Based” Criteria

- If annual geometric mean chlorophyll *a* **does not** exceed the chlorophyll *a* value for the lake type, then the TN and TP for that year are the annual geometric means of ambient TN and TP samples for that lake
- For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit is 0.49 mg/L (streams criteria)
- TN, TP, and chlorophyll *a* cannot be exceeded more than once in any consecutive calendar three year period

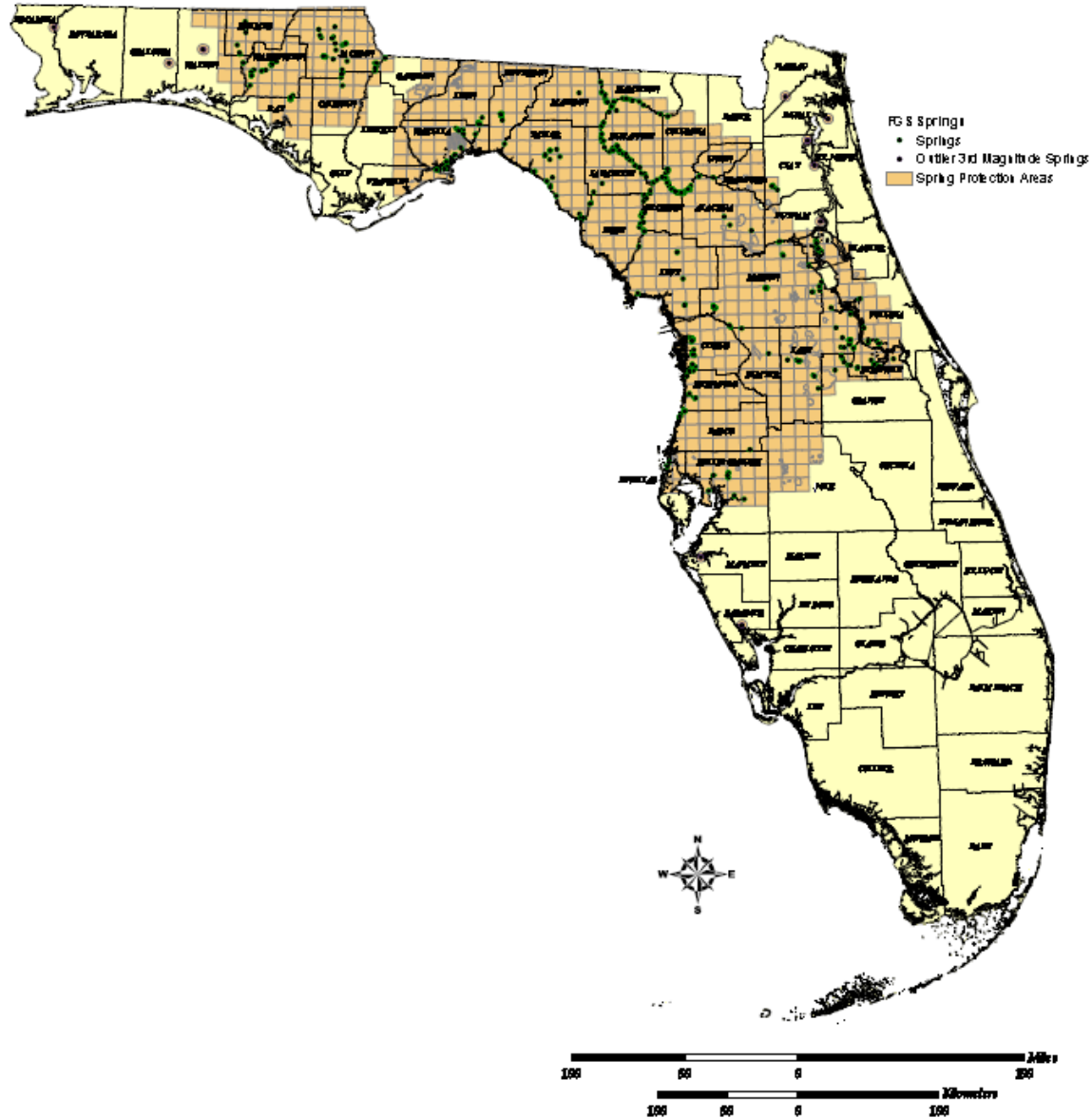


Nitrate in Spring Vents

- **Based on a cause-effect relationship between nitrate-nitrite and nuisance algal mats**
 - Criterion established at a concentration that prevents nuisance mats from occurring (compared with natural background levels)
- **Applicable numeric interpretation of the narrative nutrient criterion is 0.35 mg/L of nitrate-nitrite**
 - Expressed as an annual geometric mean, not to be exceeded more than once in any three consecutive calendar year period



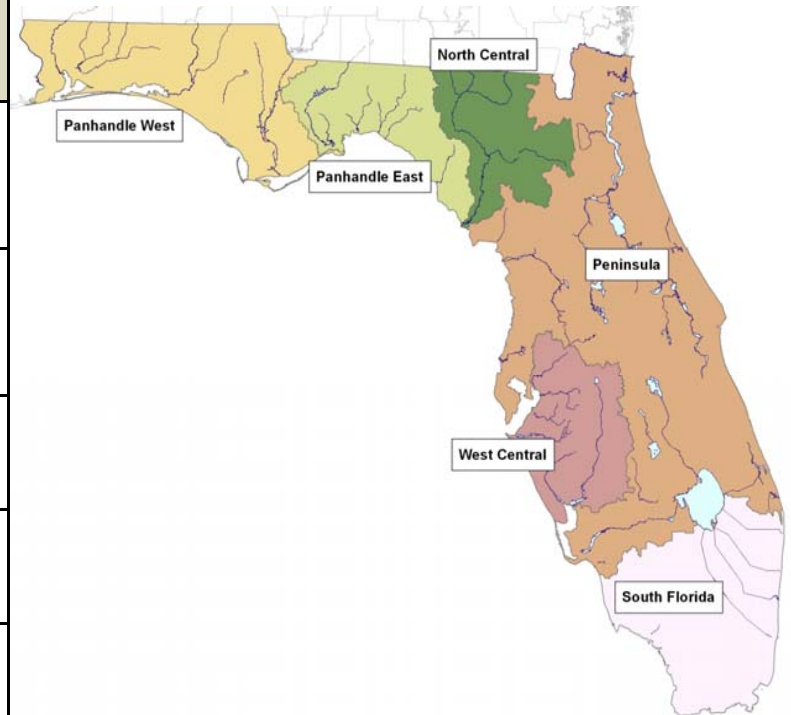
Springs Protection Areas





Streams Thresholds and Regions

Nutrient Region	Total Phosphorus Threshold	Total Nitrogen Threshold
Panhandle West	0.06 mg/L	0.67 mg/L
Panhandle East	0.18 mg/L	1.03 mg/L
North Central	0.30 mg/L	1.87 mg/L
Peninsula	0.12 mg/L	1.54 mg/L
West Central	0.49 mg/L	1.65 mg/L
South Florida	No numeric nutrient threshold. The narrative criterion in paragraph 62-302.530(47)(b), F.A.C., applies.	





NNC in Streams Achieved IF:

- Information on chlorophyll *a* levels, algal mats or blooms, nuisance macrophyte growth, and changes in algal species composition do not indicate an imbalance in flora or fauna; AND EITHER
- The average score of at least two temporally independent Stream Condition Indices (SCIs) is 40 or higher, with neither of the two most recent SCI scores less than 35, OR
- The Nutrient Thresholds (expressed as annual geometric means) are not exceeded more than once in a three year period



Expected Stream Condition



Nearfield Stream
Segment with Healthy
Flora and Fauna



Downstream Segment
with Healthy Flora and
Fauna



Floral Tools in Streams

- **DEP will evaluate a variety of floral information**
 - Linear Vegetation Survey
 - Coefficient of Conservatism, invasive exotics
 - Rapid Periphyton Survey
 - Thickness and extent, autecology (interpreting species information)
 - Phytoplankton chlorophyll *a* (current and trends)
 - Habitat Assessment
 - Substrate type, availability, mapping, etc.

**Maintained
Conveyances**



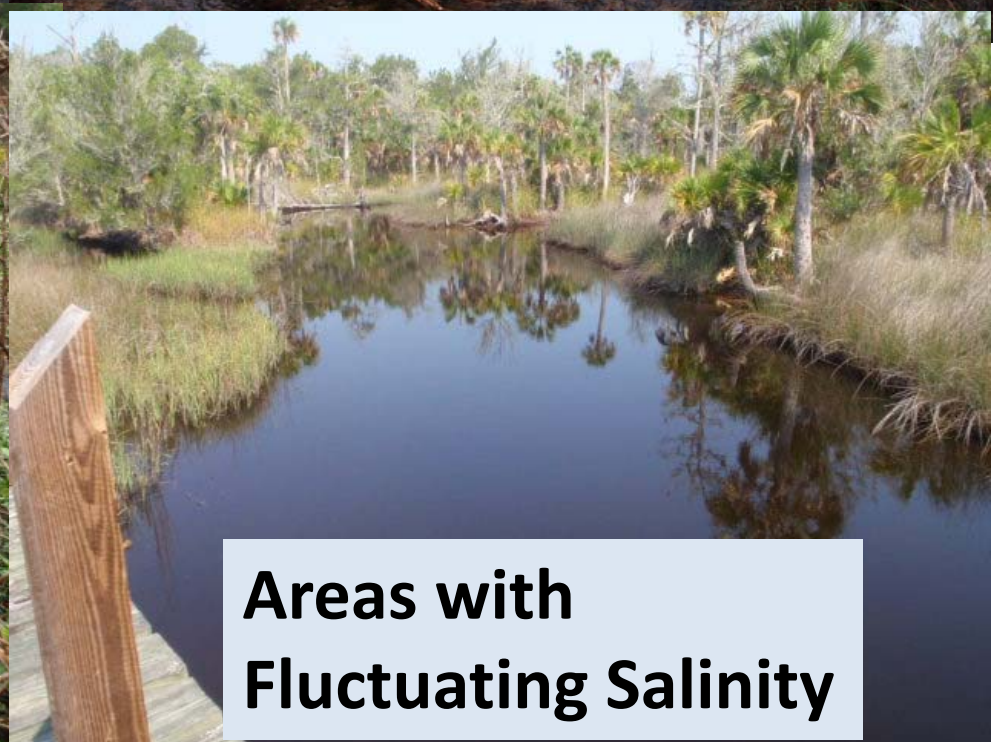
Narrative Applies to:



**Non-perennial systems:
channel has non-obligate plants**



Wetlands



**Areas with
Fluctuating Salinity**



Non-Perennial Streams

- The narrative applies in intermittent or non-perennial streams
 - To qualify, must use biological indicators, such as vascular plants and benthic macroinvertebrates, to show that desiccation results in dominance of taxa more typically found in wetland or terrestrial conditions



Canals, Ditches and Conveyances

- The narrative applies in channelized or physically altered ditches, canals and other conveyances that:
 - Are primarily used for water management purposes, such as flood protection, stormwater management, irrigation, or water supply; AND
 - Have marginal or poor stream habitat or habitat components due to channelization and maintenance for water conveyance purposes
 - Page 55 on Implementation Document



TMDLs as NNC

- Only State adopted nutrient related TMDLs are eligible and must be based upon prevention of imbalances of flora or fauna (paragraph 62-302.530 (47)(b), F.A.C.)
- TMDLS expressed as loads are OK
- Newly adopted Hierarchy 1 nutrient TMDLs must be publically noticed as new numeric interpretations of the narrative criterion and as changes to state water quality standards



Site Specific Alternative Criteria as NNC

- Type I or II are allowed
- Type III SSAC (for nutrients) provides a predictable approach
- If the flora and fauna are demonstrated to be healthy, then the existing nutrient concentrations are deemed protective
 - Phytoplankton, periphyton, and vascular plant community responses are used as primary evidence, SCI for fauna (>40)
- Must address the natural variability in nutrient concentrations and demonstrate that the designated use is being protected



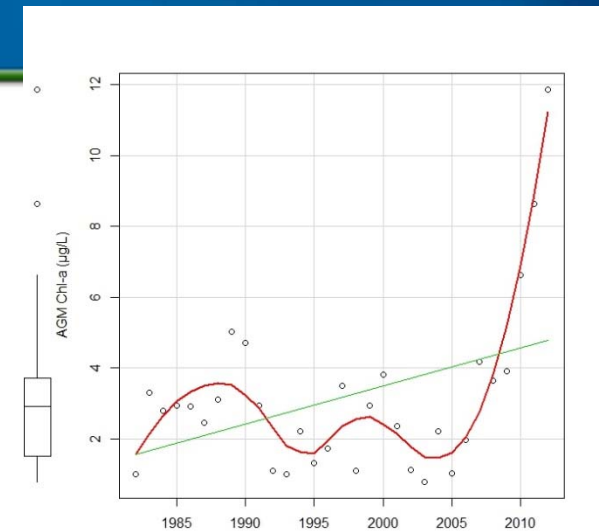
WQBEL as NNC

- WQBEL can be recognized as the applicable interpretation of the narrative nutrient criterion if:
 - 1) the documentation for the WQBEL includes a site specific numeric interpretation of the narrative criterion in paragraph 62-302.530(47)(b), F.A.C., for the waterbody;
 - 2) the WQBEL is established pursuant to the Level II Process contained in Rule 62-650.500, F.A.C.; and
 - 3) the public notice for the WQBEL specifically states that the Level II WQBEL includes a site specific interpretation of the narrative for the receiving waterbody

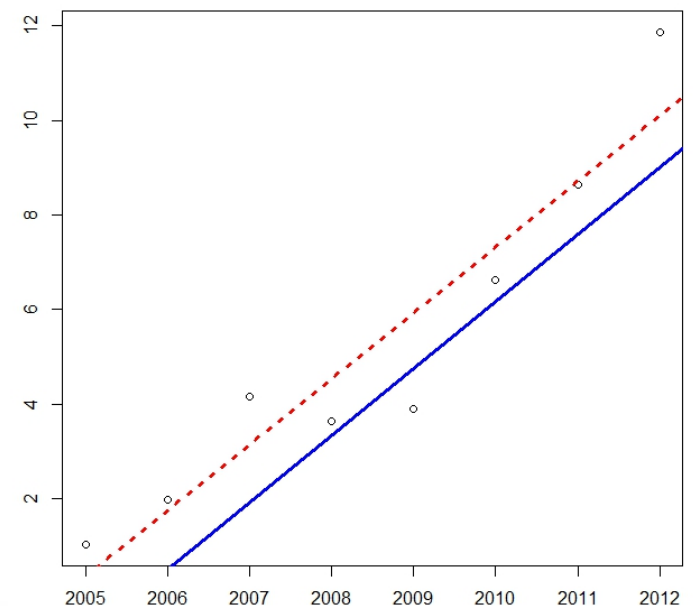


Adverse Trend Test

- For Impaired Waters Rule Assessments
- Mann's one-sided trend test
- DEP assesses whether there is a statistically significant adverse trend in nutrients (nitrate-nitrite, TN or TP) or a nutrient response variable (chlorophyll *a*) and if the waterbody is expected to become impaired
- Determine a trend only after controlling for confounding variables



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Next Steps for NNC

- **Providing training for NNC permit implementation**
- **Provide training to DEP district biologists**
- **Meetings with District staff to discuss implementation issues, including:**
 - Wastewater Permitting Issues
 - WQBEL Development
 - Downstream Waters Protection
 - Reuse Facilities
 - Implementing the NNC in 303(d) Assessments



Questions or Comments

