

# Nutrient Criteria: The Florida Situation

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Mark Osborn  
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**MISSOURI**  
DEPARTMENT OF  
NATURAL RESOURCES

# Background

- Florida Narrative Criteria: “In no case shall nutrient concentration of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna.”

FL Admin Code 62-302.530(47)(b)

# Timeline

- December 2003: FDEP submits plan for developing numeric nutrient criteria.
  - Scheduled submission of rule to Environmental Regulation Commission for Oct, 2005.
- Deadline blown. Revised target dates set at least four times in subsequent years.
- July 2008: Environmental organizations sue EPA. The complaint: FL narrative criteria do not offer adequate protection, and EPA needs to step in.

## Plaintiffs: “Florida Wildlife Parties”

- Florida Wildlife Federation
- Sierra Club
- Conservancy of Southwest Florida
- Environmental Confederation of Southwest Florida
- St. Johns Riverkeeper

## Timeline (cont.)

- January, 2009: EPA, in letter to FDEP, declares intent to promulgate numeric nutrient criteria for the state due to failure of FDEP to do so. This is the “2009 Determination”.
- August, 2009: Florida Wildlife parties and EPA jointly move for Consent Decree.
- December, 2009: Judge Robert Hinkle (US District Court, Northern Florida) obliges.

# The Consent Decree

- EPA to publish proposed numeric nutrient standards
  - Lakes and flowing waters: January, 2010
  - Coastal and estuarine waters: January, 2011
- Adoption of revised standards
  - Lakes and flowing waters: October, 2010
  - Coastal and estuarine waters: October, 2011

## Here Come the “State and Industry Parties”

- FL Dept. of Agriculture and Consumer Services
- South Florida Water Management District
- 11 trade associations
  - FL Pulp and Paper Ass’n
  - FL Farm Bureau
  - Southeast Milk, Inc.
  - Florida Citrus Mutual, Inc.
  - FL Fruit & Vegetable Ass’n
  - American Farm Bureau Federation
  - FL Stormwater Ass’n
  - FL Cattleman’s Ass’n
  - FL Engineering Society
  - FL Water Environment Ass’n  
Utility Council, Inc.
  - FL Minerals and Chemistry  
Council, Inc.

## Timeline (cont.)

- 2010 – 2011: State and Industry parties file 13 separate lawsuits seeking to invalidate 2009 determination and the newly promulgated EPA nutrient rule.
- Other litigation: Florida Wildlife parties, joined by Gulf Restoration Network and NRDC (the “Gulf Restoration Parties”), assert that the rule is too lenient.
- February 18, 2012: Judge Hinkle, having consolidated all aforementioned cases, issues his ruling.

# EPA's Nutrient Rule for Florida

- Entered into Federal Register December 6, 2010
- Lakes
- Streams
- Springs
- Site-Specific Alternative Criteria

# Lakes



# Lake Numeric Criteria

Lake Color and Alkalinity	Chlorophyll-a (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)
Colored Lakes	<b>0.020</b>	<b>1.27</b> [1.27 – 2.23]	<b>0.05</b> [0.05 – 0.16]
Clear Lakes, High Alkalinity	<b>0.020</b>	<b>1.05</b> [1.05 – 1.91]	<b>0.03</b> [0.03 – 0.09]
Clear Lakes, Low Alkalinity	<b>0.006</b>	<b>0.51</b> [0.51 – 0.93]	<b>0.01</b> [0.01 – 0.03]

- Colored Lakes: PCU > 40; Clear Lakes: PCU ≤ 40
- Alkalinity Threshold: 20 mg/L CaCO<sub>3</sub>
- **Baseline Criteria**
- [Range of Modified Criteria]

# Lake Modified Criteria

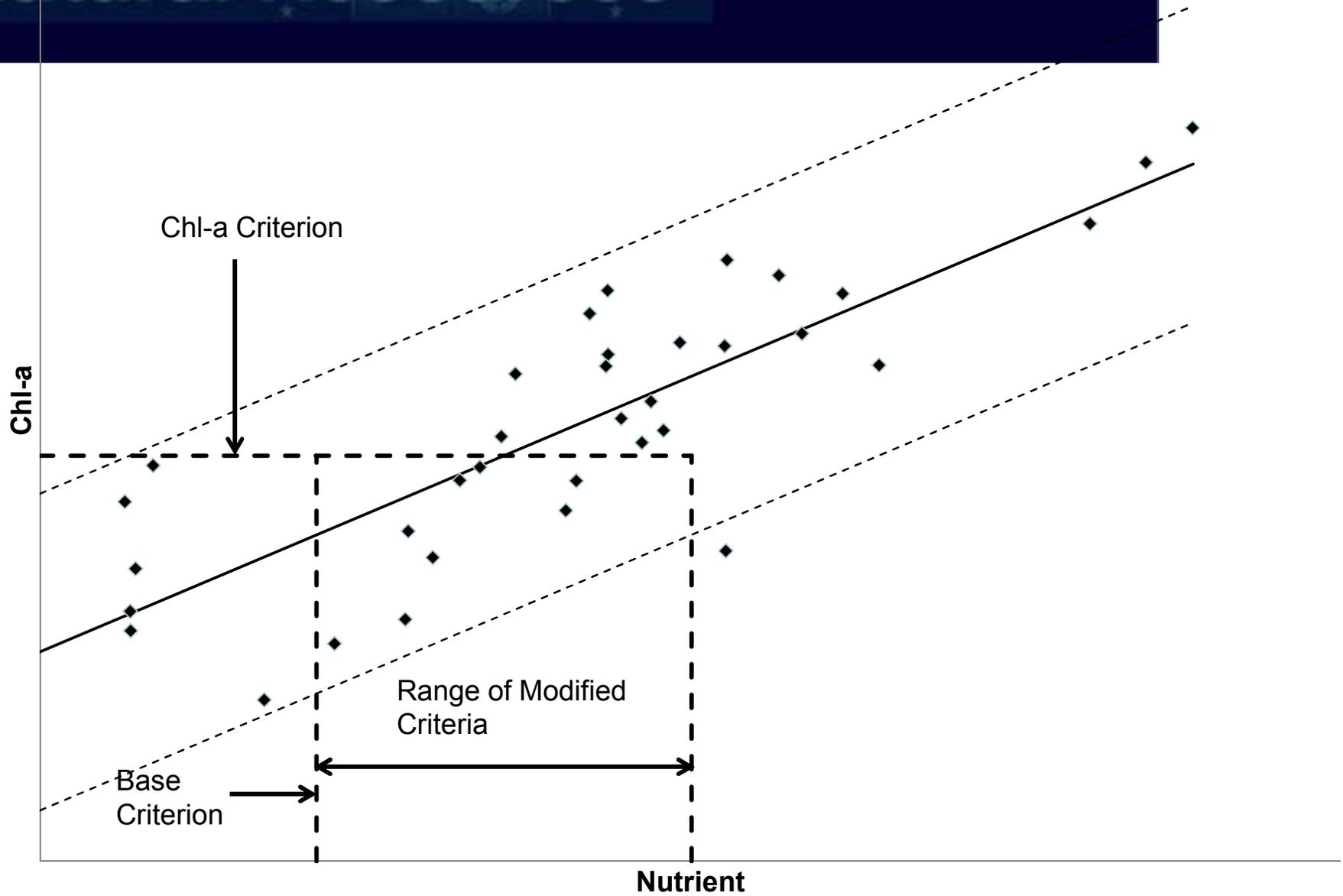
- Calculated for specific lakes with sufficient data (4x/year).
- Annual geometric mean for Chl-a has not exceeded criteria for at least three years immediately preceding.
- Modified TN and TP criteria:
  - Must be within range specified in Table
  - Must not exceed criteria for streams to which a lake discharges

## Scientific Rationale for Lake Criteria

- Lake Classification
  - Correlations of Chl-a response to TN and TP were stronger when lakes were categorized by color.
  - Within Clear Lakes ( $\leq 40$  PCU), TP, TP and Chl-a concentrations were influenced by alkalinity; threshold was identified at 20 mg/L  $\text{CaCO}_3$ .
- Chlorophyll-a Criteria:
  - Expected Trophic Status of Lake, based on internationally accepted lake use classifications (OECD, 1982).

## Scientific Rationale for Lake Criteria (cont.)

- Total Nitrogen and Total Phosphorus
  - Baseline Criteria: 75<sup>th</sup> percentile of predicted Chl-a distribution from regression relationship equivalent to Chl-a criterion for lake class.
  - Modified Criteria: Range is from baseline criteria level to point at which Chl-a criterion for lake class is at 25<sup>th</sup> percentile of predicted Chl-a distribution.



# Streams



# Stream Numeric Criteria

Nutrient Watershed Region	Instream Protective Value Criteria	
	TN (mg/L)	TP(mg/L)
Panhandle West	0.67	0.06
Panhandle East	1.03	0.18
North Central	1.87	0.30
West Central	1.65	0.49
Peninsula	1.54	0.12

# Missouri Department of Natural Resources



## Scientific Rationale for Stream Criteria

- Identification of Reference Streams
  - Stream Condition Index (SCI) > 40
  - Benchmark (Analysis of human disturbance)
  - Exclude streams on 303(d) for nutrients of low D.O.
- Threshold Determination
  - SCI: 75<sup>th</sup> Percentile (West Central Region)
  - Benchmark: 90<sup>th</sup> Percentile (All other regions except South)

## Stream Criteria for Protection of Downstream Lakes

$$[TP]_S = \frac{1}{c_f} [TP]_L (1 + \sqrt{\tau_W})$$

$[TP]_S$ : Downstream Lake Protection Value for TP (mg/L)

$[TP]_L$ : Applicable Lake Criterion (mg/L)

$c_f$ : Fraction of inflow due to all stream flow,  $0 \leq c_f \leq 1$

$\tau_W$ : Lake's Hydraulic Retention Time (Volume/Annual Flow)

# Springs

- $[\text{NO}_2 + \text{NO}_3]$ : 0.35 mg/L

## Scientific Rationale

- Stressor response: Laboratory and field studies of two nuisance algae species (*Lyngbya wollei* and *Vaucheria sp.*) indicated that this was a threshold for accelerated growth.

# Site Specific Alternative Criteria

- Any entity may apply to EPA Region 4 Administrator for change in criteria for specific water body (state, city, county, municipal or industrial discharger, consultant, client, individual or organization)
- Applicant must provide adequate scientific rationale (data, stressor response analysis, etc.)
- Subject to public comment period, etc.

# The Judge's Ruling

- 2009 Determination: The state and industry parties request that numeric nutrient criteria be invalidated.
- Response:
  - FDEP, a state entity, had acknowledged need for numerical nutrient criteria.
  - Florida not unlawfully singled out.
  - CWA calls for criteria for all waters, impaired or unimpaired.
  - Use of numeric criteria is “not arbitrary or capricious”.

# The Judge's Ruling: Lakes

- S & I parties' complaint: Classification scheme and parameter limits. Some lakes in NW FL are naturally high in TP but meet designated uses.
- Response:
  - WQS adoption does not require showing that designated uses are not being met. CWA also authorizes anticipation of future impairment.
  - If "Natural" conditions include exceedence of criteria, it can be addressed through SSAC or TMDL.
  - Rule is "not arbitrary or capricious".

## The Judge's Ruling: Lakes (cont.)

- S & I parties' complaint: Requirement for all three parameters (TN, TP, and Chl-a).
- Response:
  - Chl-a response in linear regressions is a defensible model.
  - Chl-a can be a lagging indicator: "Gale-force winds, heavy rain, and a storm surge are reliable indicators of bad weather, but a prudent sailor checks the barometer in advance."
  - Requirement is "not arbitrary or capricious".

## The Judge's Ruling: Lakes (cont.)

- Gulf Restoration parties' complaint: Modified criteria would allow FDEP to change criteria without EPA oversight.
- Response:
  - EPA set up specific guidelines.
  - Blunts some of the force of S & I parties' complaints.
  - Nothing in CWA or Administrative Procedures Act prohibits this approach.
  - Modified criteria provision is “not arbitrary or capricious”.

## The Judge's Ruling: Lakes (cont.)

- GR parties' complaint: Duration and frequency component of rule is too lenient.
  - Duration and Frequency: Water body is out of compliance only if annual geometric mean of parameter exceeds limit more than one year out of any consecutive three years.
- Response:
  - Temporary nutrient spikes are common and unlikely to cause lasting harm to aquatic life.
  - D & F provision is “not arbitrary or capricious”.

## The Judge's Ruling: Springs

- GR parties' complaint: Laboratory studies indicated lower threshold for nuisance algae spp.
- Response:
  - Inclusion of field studies accounts for complexities in system that are not replicated in the lab.
  - Criterion for springs is “not arbitrary or capricious”.

# The Judge's Ruling: Streams

- Complaint from both sides: Sample streams selected are not the right target.
- Response:
  - The target should identify *harmful* increase in nutrient concentration. EPA did not demonstrate that an increase over 90% (or 75%) of streams deemed unimpaired represents a harmful increase.
  - Stream criteria as currently calculated are “arbitrary or capricious”.

## The Judge's Ruling: DPVs

- S & I parties' complaint: DPVs are unnecessary and unprecedented. Criteria for streams are sufficient.
- Response:
  - Being unprecedented is not a reason not to proceed. "A better mousetrap is by definition unprecedented, but it is an improvement nonetheless."
  - If stream is contributing to lake impairment, it is part of problem, whether or not it is meeting stream criteria.
  - Inclusion of DPVs is "not arbitrary or capricious".

## The Judge's Ruling: DPVs (2)

- S & I parties' complaint: EPA ignored factors besides streams that contribute to lake impairment.
- Response:
  - For lakes that are listed as impaired, TMDL modeling does take other factors (e.g. direct runoff to lake) into account, and any contribution from streams may be part of the problem.
  - For lakes that are not impaired, as with streams, a harmful increase is not identified.
  - DPV as currently calculated is “arbitrary or capricious”.

# The Judge's Ruling: Canals

- S FL Water Management District Complaint: DPVs for canals that enter lakes.
- Response:
  - Canals are not subject to effluent limitations, however, they are subject to water quality criteria.
  - Exempting a canal from a DPV provision would effectively exempt any water upstream of canal and that indirectly flows into lake.
  - DPV for canals is “not arbitrary or capricious”.

# The Judge's Ruling: SSAC

- Environmental groups' complaint: Provision could allow changes to broad areas (e.g. entire watersheds) in criteria without safeguards of rulemaking.
- Response:
  - This does not appear to be a probable scenario at this time. It is speculative.
  - Not “ripe” for judicial review.
  - Inclusion of SSAC in rule is “not arbitrary or capricious”.

## Follow-up

- EPA rule (excepting stream and DPV provisions) to go into effect March 6, 2012.
  - This has now been postponed until July 6, 2012.
- EPA to submit new proposals for streams and DPVs by May 21, 2012.
  - May be extended, subject to provisions in Consent Decree.

## Meanwhile

- Florida has passed its own nutrient criteria
  - Numeric translator of narrative criteria.
  - Lake numbers mostly resemble EPA numbers except in West Central region (Tampa area), where max TP for colored lakes is 0.49 mg/L.
  - Under legal challenge by environmental parties.