

# Phosphorus Rules

## NR 102.06, NR 151 and NR 217

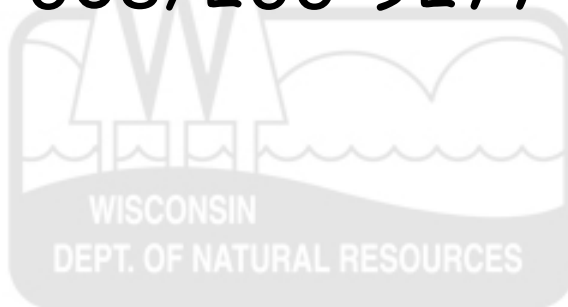
### Subchapter III

Jim Baumann

Wisconsin Department of Natural Resources

[james.baumann@wisconsin.gov](mailto:james.baumann@wisconsin.gov)

608/266-9277





# Phosphorus - 3 Rule Changes

- S. NR 102.06 - phosphorus water quality standards criteria for streams, lakes and Great Lakes
- Ch. NR 151 - additional nonpoint source performance standards and prohibitions - phosphorus index for farm fields
- Subch. III, NR 217 - water quality based effluent limits



# Status

- NR 102 and NR 217 changes became effective December 1, 2010
- EPA approved NR 102 changes on December 30, 2010
- NR 151 changes became effective January 1, 2011
- Guidance being developed on a number of topics



# Why Develop the Criteria

- Obvious water quality problems in state
- EPA requirement

# Algal Mats on Lake Michigan Beaches

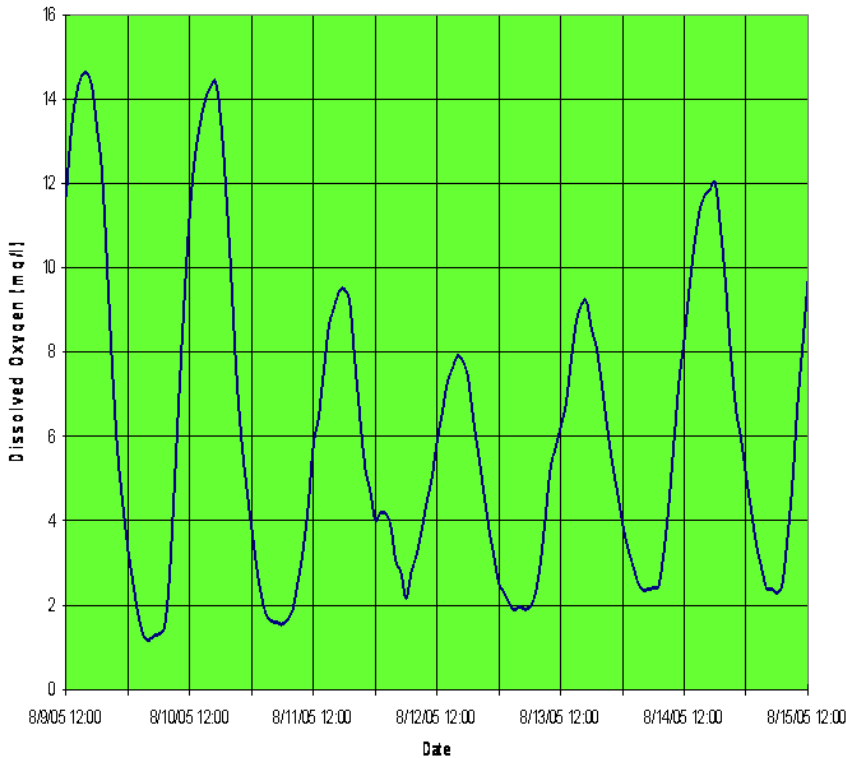


- Discourage beach use
- Clog power plant water intakes
- Increase disease risk to humans and wildlife
- Inhibit national golf tournaments

# Algae covering streams

- Algae detrimental to aquatic life

Turtle Creek at Pounder Rd., Walworth Co. -- Dissolved Oxygen in Low Flow Conditions





# Human Health Concerns

- **Toxic algae**





# Criteria uses include

- Goal for lake and stream management
- Used as a factor to determine impaired waters (or not impaired)
- Target for TMDLs
- Basis for water quality based effluent limits for point sources

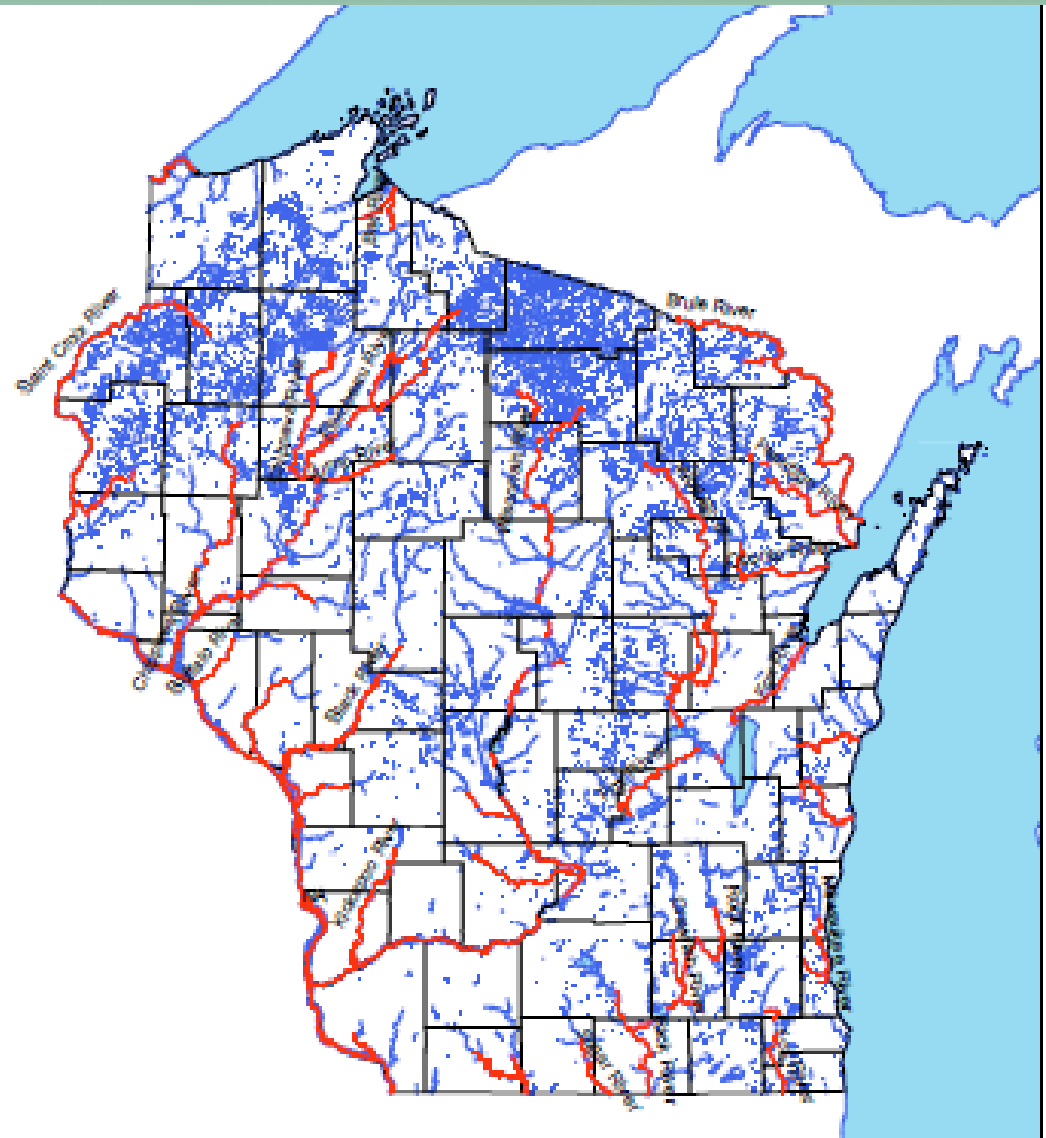




# Chapter NR 102 - P Criteria

- Rivers - 100 ug/l (46 listed)
- Streams - 75 ug/l
- Lakes and Reservoirs - 15 - 40 ug/l
- Lake Michigan - 7 ug/l
- Lake Superior - 5 ug/l
- No ephemeral streams, wetlands, LAL waters

**“Rivers”**  
**100 ug/l**





# Basis for Lake Criteria

- Minimize risk of nuisance algal blooms -
  - 5% chance of 20 ug/l chl. *a* bloom
  - 1% chance of 30 ug/l chl. *a* bloom
- Protect sport fisheries
- Prevent shift in shallow lakes from macrophytes to algal domination
- Maintain dissolved oxygen in hypolimnion of 2-story lakes
- Protect and provide margin of safety for deep seepage lakes



# Specific Lake Criteria

- 2-story lakes - 15 ug/l
- Stratified drainage lakes - 30 ug/l
- Stratified seepage lakes - 20 ug/l
- Non-stratified lakes - 40 ug/l
- Stratified reservoirs - 30 ug/l
- Non-stratified reservoirs - 40 ug/l



# Site-specific Criterion

- “Mentions” process for developing site-specific criterion
  - Must have scientific rationale
  - Must be adopted by administrative rule
  - Must be approved by EPA
- Most applicable to reservoirs and 2-story lakes



# Phosphorus Criteria for Lakes

- Don't apply to lakes of less than 5 acres in size
- Don't apply to wetlands
- Waters impounded that don't have sufficient water residence time to be considered as a reservoir (e.g. millpond)

# Phosphorus from many Point Sources and Nonpoint Sources



# NR 151 et. al.— Nonpoint Source Performance Standards and Prohibitions Amendments

“Quasi-enforceable”







# Implementing Programs

- Farmland Preservation/Working Lands Initiative - DATCP
  - Cross compliance requirements
- Environmental Quality Incentives Program (EQIP)- USDA - NRCS
- County ordinance compliance
- Nonpoint Source Program



# Phosphorus Index

- Applies to croplands, pastures & winter grazing areas
- $PI=6$ , with maximum year of 12
- Based on crop rotations, soil test results, soil erosion potential, etc.

# NR 217, Subchapter III

## Phosphorus WQBELs and Implementation for Point Sources





## NR 217(III) - Water Quality Based Effluent Limitations

- WQBEL will vary from facility to facility, based on phosphorus in receiving lake, stream or river

(Subchapter II Technology based phosphorus limits of 1 mg/l or alternate in effect since 1993)



## 2 Ways to Derive WQBELs

- Calculated through s. NR 217 mass balance equation (point source oriented calculation)
- Consistent with an EPA approved Total Maximum Daily Load





# TMDLs Being Developed

- Rock River
- Lower Fox River/Lower Green Bay
- Red Cedar River
- Wisconsin River (down to Lake Wisconsin)
- Upper Fox River/Wolf River
- Milwaukee River
- Others



# 3+ Implementation Options

1. Install, if needed, and operate needed technology
  2. Pursue water quality (pollutant) trading
  3. Implement Watershed Adaptive Management Option
- + Variance



# Implementation Option 1

- Install treatment processes, if needed, and operate facility to meet WQBEL
  - Extended compliance schedule may be requested and provided, if necessary







# Implementation Option 2

- Water quality (pollutant) trading  
Create a more than equivalent phosphorus load reduction through agreements with others



- WWTP point source - MS4 - agricultural NPS



# Implementation Option 3

- **Watershed Adaptive Management Option**

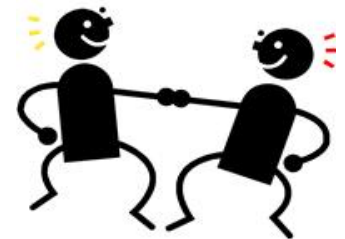
Improve upstream water quality so that less stringent effluent limit is applicable

- Applies in nonpoint source dominated watersheds



# Implementation Option 3

- Permittee agrees to interim effluent limits
  - Permit 1 - 0.6 mg/l - reevaluate
  - Permit 2 - 0.5 mg/l - reevaluate
  - Permit 3 - Calculated WQBEL if necessary
- Permittee agrees to monitor stream
- Permittee develops and helps implement plan with partners to control urban storm water and nonpoint sources in watershed





## Trade Example – Small-ish Community

- Oxidation Ditch – average TP 0.3 mg/L
- Base WQBEL limit 0.075 mg/l
  - \$1.3 million capital expenditure – filtration
  - \$136,000 per year O&M
  - \$240,000 per year with CWF loan and O&M
    - about \$150 to \$175 per household per year
  - Trading option -- \$14,000 per year
    - <\$10 per household per year



## Trade Example -- Continued

- Trade cost relatively low due to small difference between current mass discharge and mass discharge to achieve WQBEL.
- Trade cost substantially greater if going from 4 mg/L to 0.075 mg/L.
- TMDL WQBEL  $\sim 0.25$  mg/L
  - Trading -- \$5,000 per year



# Recent Issues -- National

- January 2011, EPA directed Illinois EPA to include nutrient effluent limits in permits for a number of wastewater based on narrative criteria
- March 1 Notice of Intent to sue Metro. Water Reclamation Dist. Of Greater Chicago over phosphorus discharges by NRDC, Sierra Club, Prairie Rivers Network



## More Recent -- Wisconsin

- Governor's Biennial Budget Bill - errata sheet
  - Change the effective date of s. NR 102.06, water quality standards criteria and effective date of subchapter III of NR 217, point source limits and implementation
  - Limits repeal of performance standards and prohibitions in ch. NR 151 to only 40% TSS control (by 2013).



# Change Effective Date of Standards and Permit Provisions

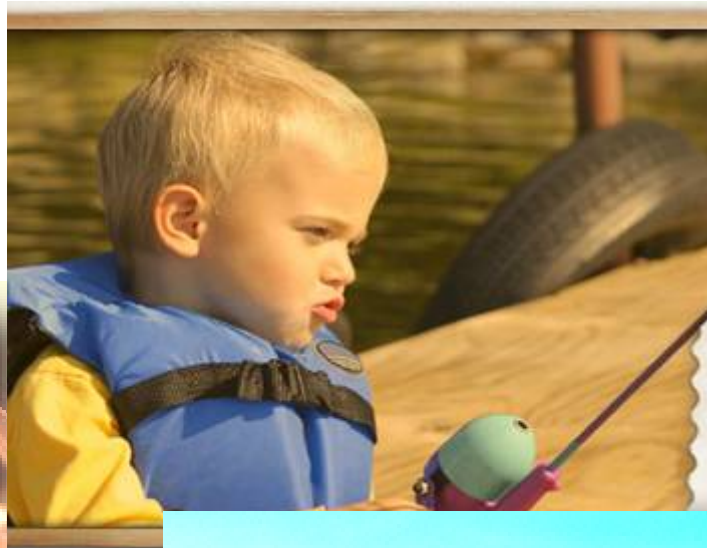
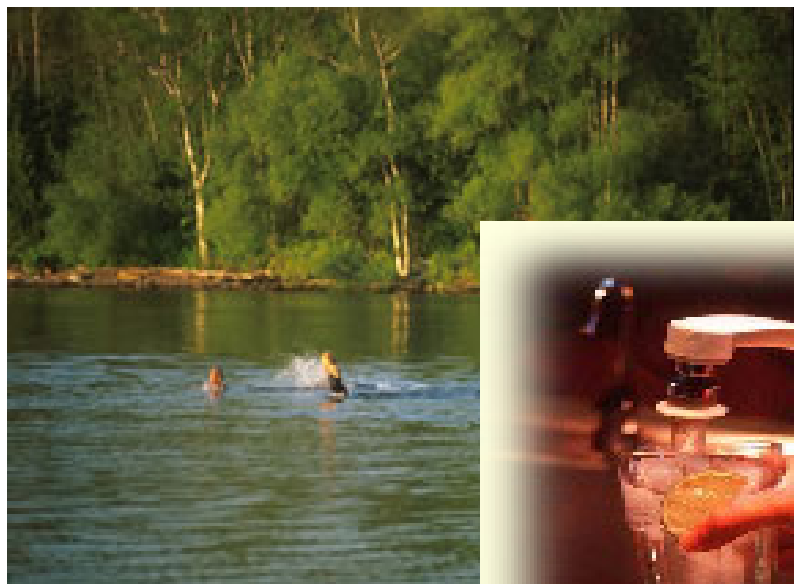
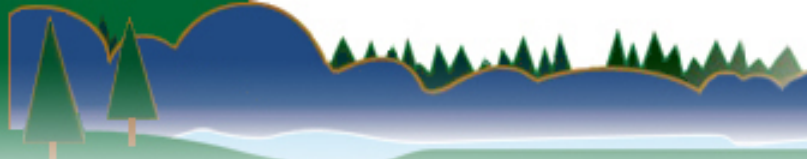
- Concept used by EPA in Florida to develop procedures and all point source permittees to consider options
- Will require EPA "acceptance" and approval of change in effective date from December 1, 2010 to a later date
- Department would need to request approval





# If enacted, DNR activities next 2 years

- Continue to implement performance standards and prohibitions
  - new bonding authority in bill
- Complete guidance and train staff on use
- Complete water quality trading procedures
- Conduct monitoring needed to develop permit limits
- Conduct outreach activities to municipalities and industries on options
- Complete ongoing TMDLs



Questions?