



**Environmental
Protection Agency**

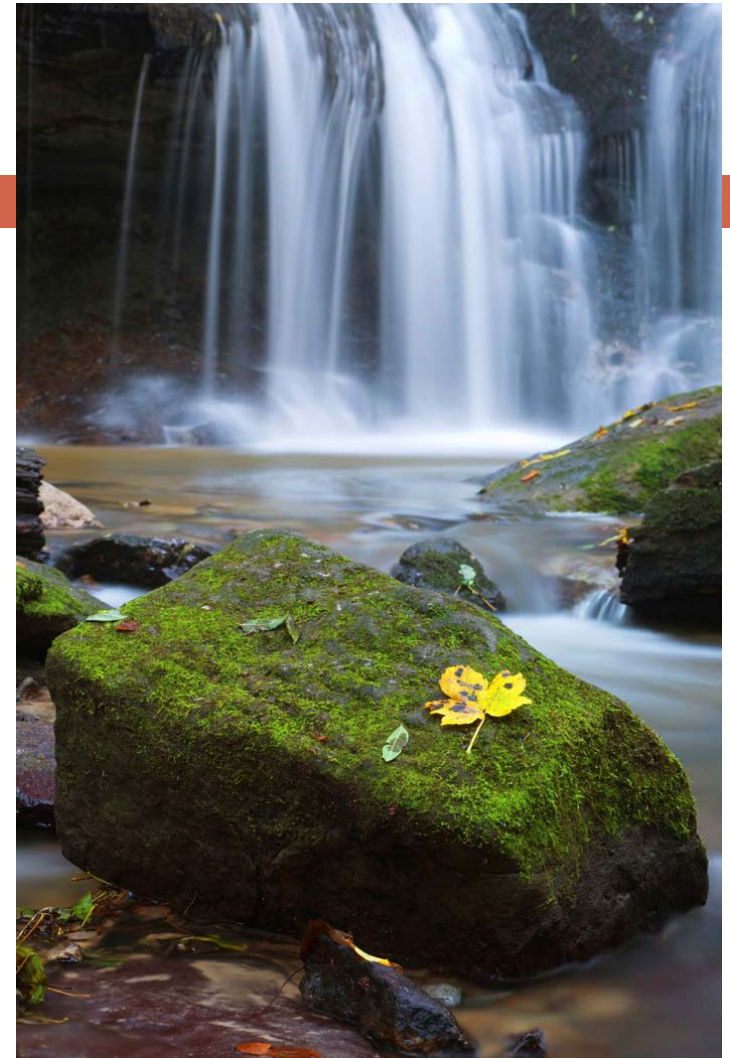
**OWEA ANNUAL CONFERENCE
JUNE 17, 2010**

George Elmaraghy, Chief, DSW

Overview

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- **Nutrients update**
- **Ammonia water quality criteria**
- **Fish tissue trends**
- **Mercury variance**
- **Total dissolved solids**
- **Marcellus shale gas production**
- **Storm water program changes**
- **GLRI projects**
- **Lake Erie phosphorus task force**



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Look Ahead

Update on Nutrients



Draft Nutrient Criteria

for streams and rivers (<500 sq. mi. drainage)

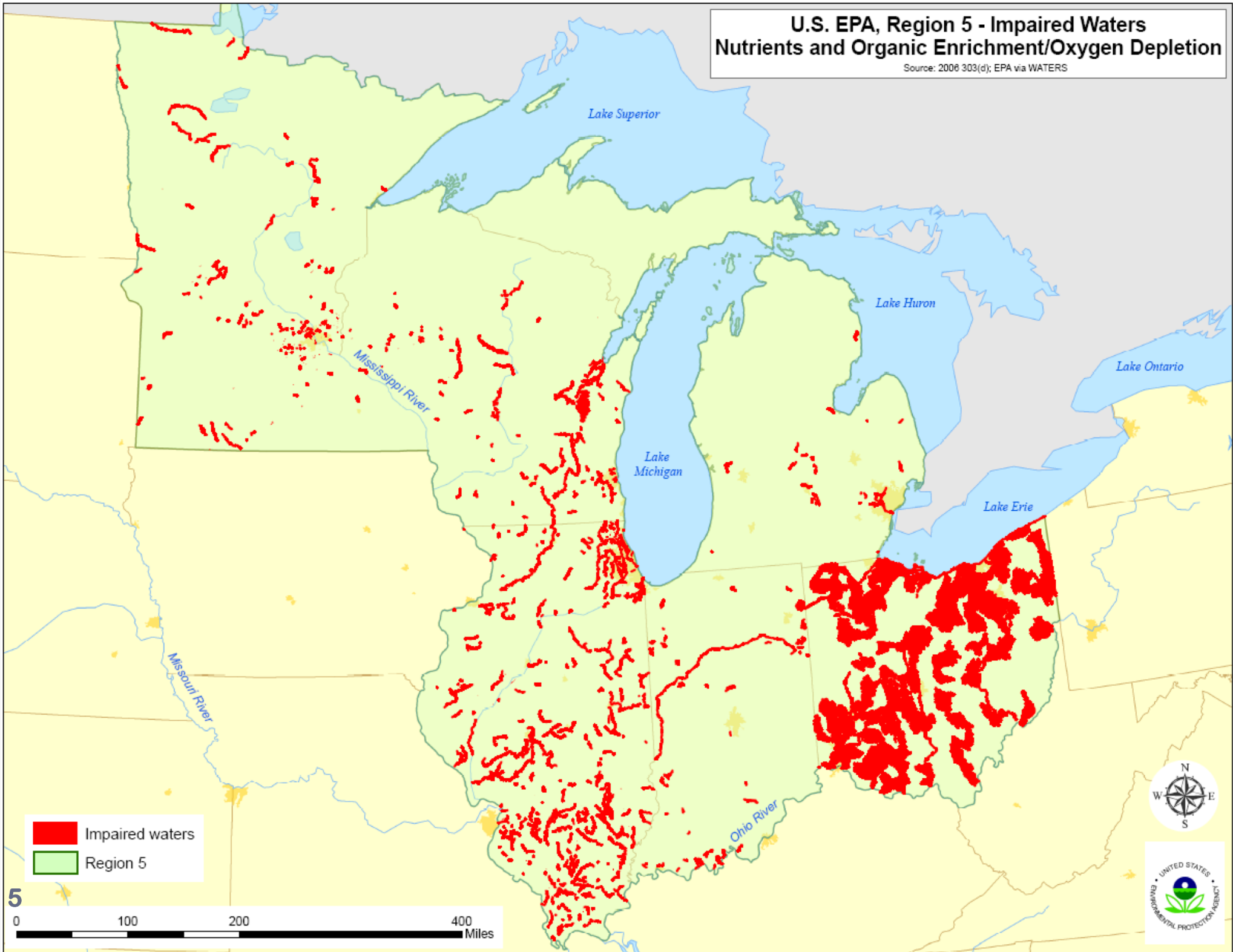
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	Phosphorus	Nitrogen
Most streams	0.10 mg/l	1.1 mg/l
Nutrient sensitive streams	0.04 mg/l	0.44 mg/l

- Specifics on how to implement criteria are under development with U.S. EPA
 - ▣ Reduction strategies could be tied to biological response indicators, benthic algae, dissolved oxygen, available sunlight (canopy)

U.S. EPA, Region 5 - Impaired Waters Nutrients and Organic Enrichment/Oxygen Depletion

Source: 2008 303(d); EPA via WATERS



Impaired waters
Region 5

5
0 100 200 400 Miles



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Look Ahead

U.S. EPA Draft Ammonia Water Quality Criteria



U.S. EPA Ammonia WQC

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- Published **DRAFT** update of aquatic life water quality criteria for ammonia
 - Values more protective of freshwater mussels in accordance with latest science
 - Comment period ended April 1, 2010

U.S. EPA Ammonia WQC

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	Draft 2009 Ammonia Criteria (at pH 8, 25°C)	Current Ohio EPA WWH Criteria (at pH 8, 25°C)
ACUTE	2.9 mg/L mussels present 5.0 mg/L mussels absent	9.1 mg/L
CHRONIC	0.26 mg/L mussels present 1.8 mg/L mussels absent	1.0 mg/L

U.S. EPA Ammonia WQC

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□ **Ohio EPA's comments**

- **Majority of Ohio's streams and rivers would be impacted by mussel present criteria**
- **Upgrades of WWTPs may be necessary**
- **Concern that other factors such as habitat destruction and stream flow alterations may limit mussel population recovery even with ammonia loading reductions**

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Fish Tissue Analysis Trends

Mercury & PCBs



Fish Tissue Mercury & PCB Trends

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- Analysis of fish tissue database 1993-2008
- Lake Erie and Ohio River
 - ▣ Results for both water bodies similar
 - ▣ PCBs seem to be decreasing or leveling off, mercury seems to be increasing in fish tissue

Fish Tissue Mercury & PCB Trends

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	Geomean Hg ppb ('01-'08)	% Hg Change '93-'00/'01-'08	Geomean PCBs ppb ('01-'08)	%PCB Change '93-'00/'01-'08
Lake Erie – Trophic Level 3 (n=180, 129)	93	↑ 37%	311	↓ 43%
Lake Erie – Trophic Level 4 (n=199, 179)	156	↑ 70%	271	↑ 38%
Ohio River – Trophic Level 3 (n=74, 177)	95	↑ 73%	387	↓ 20%
Ohio River – Trophic Level 4 (n=276, 113)	134	↑ 49%	271	↓ 1%

Fish Tissue Mercury & PCB Trends

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□ Additional Results

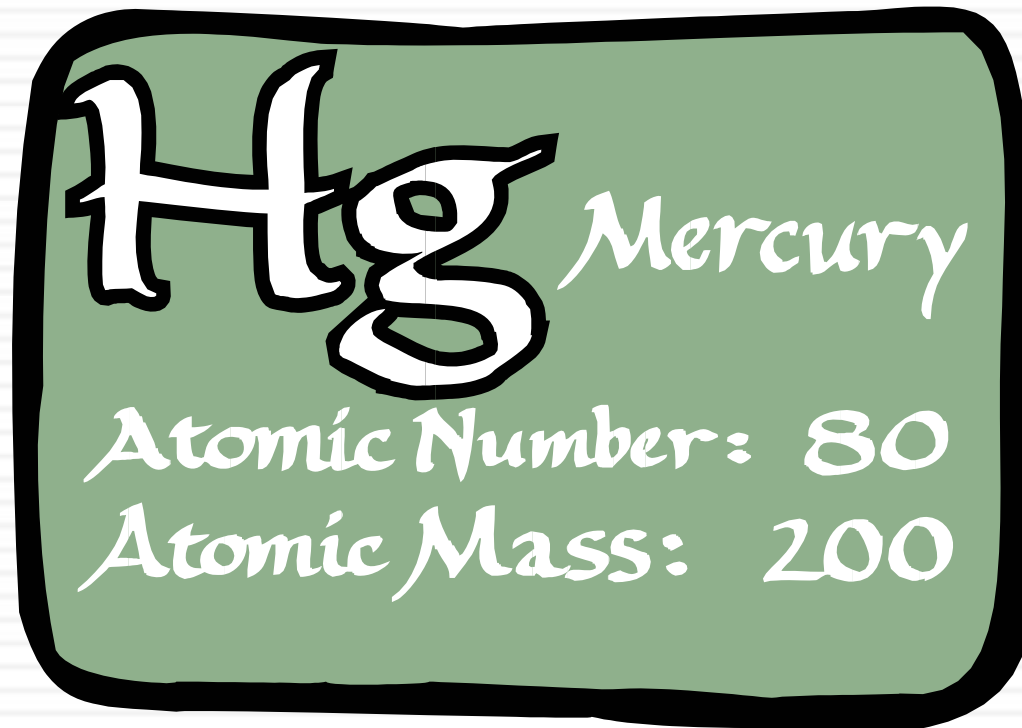
- **Inland lakes** - Both mercury and PCBs appear to be declining overall
- **Large rivers** – PCBs have either leveled off or are decreasing slightly; Mercury has increased by an avg of 50% (1993-2000 vs. 2001-2008)



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Look Ahead

Mercury Variance



Mercury Variances

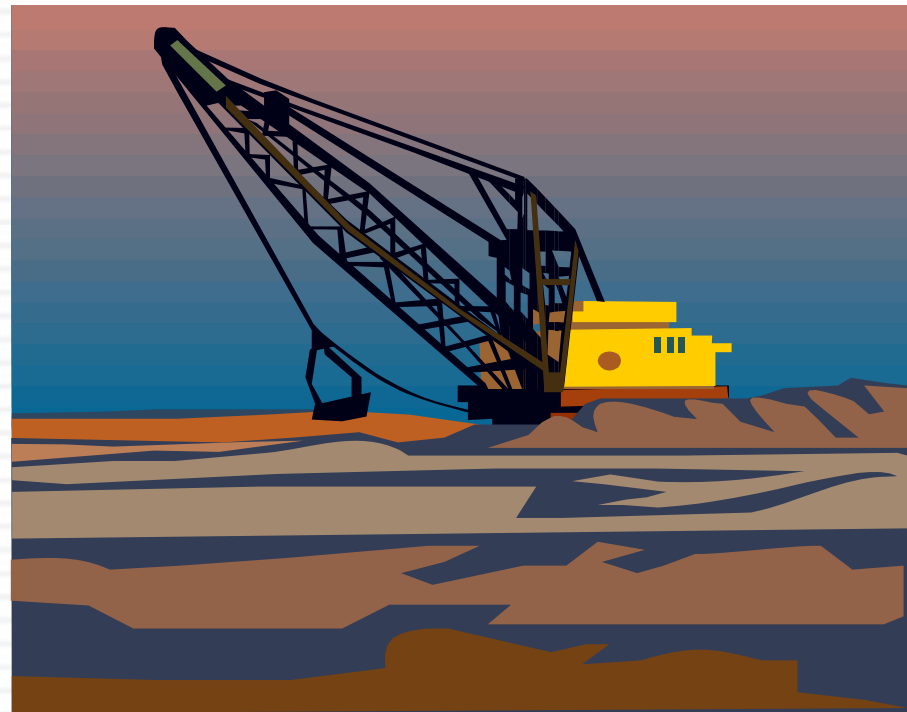
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- Rule OAC 3745-33-07 up for 5-year review
– **no changes currently proposed to mercury variance**
- Submitted GLRI proposal requesting \$410,154 for mercury reduction and treatment cost study update – **NOT FUNDED**

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Look Ahead

Appalachian Total Dissolved Solids Standard



Ohio Water Quality Standard

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- **Total Dissolved Solids – 1500 mg/l**
(monthly average)
 - Equivalent to 2400 $\mu\text{S}/\text{cm}^2$ specific conductance

Recent Federal TDS Studies

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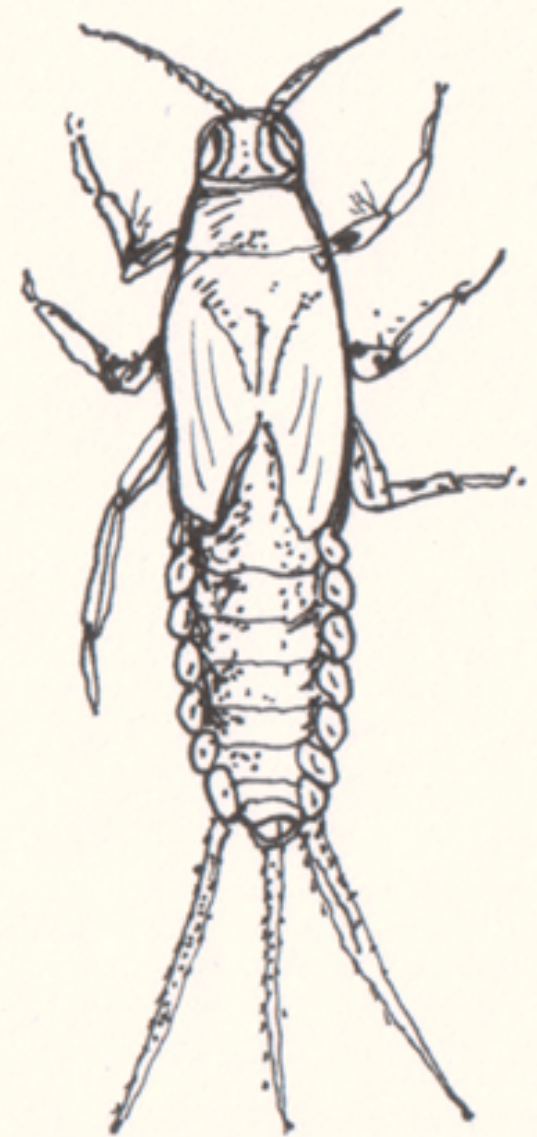
- ***A Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams***
 - ▣ 300-500 $\mu\text{S}/\text{cm}^2$ conductivity needed for Appalachian waters (~188-313 mg/l)
 - ▣ No Ohio data used in analysis

<http://www.epa.gov/wetlands/guidance/mining.html>

Ohio EPA Field Data

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- Ohio EPA reference sites higher than federal criteria
- ICI and mayfly richness met at higher TDS
 - ▣ Work to date indicates **~800-1000 mg/l TDS**

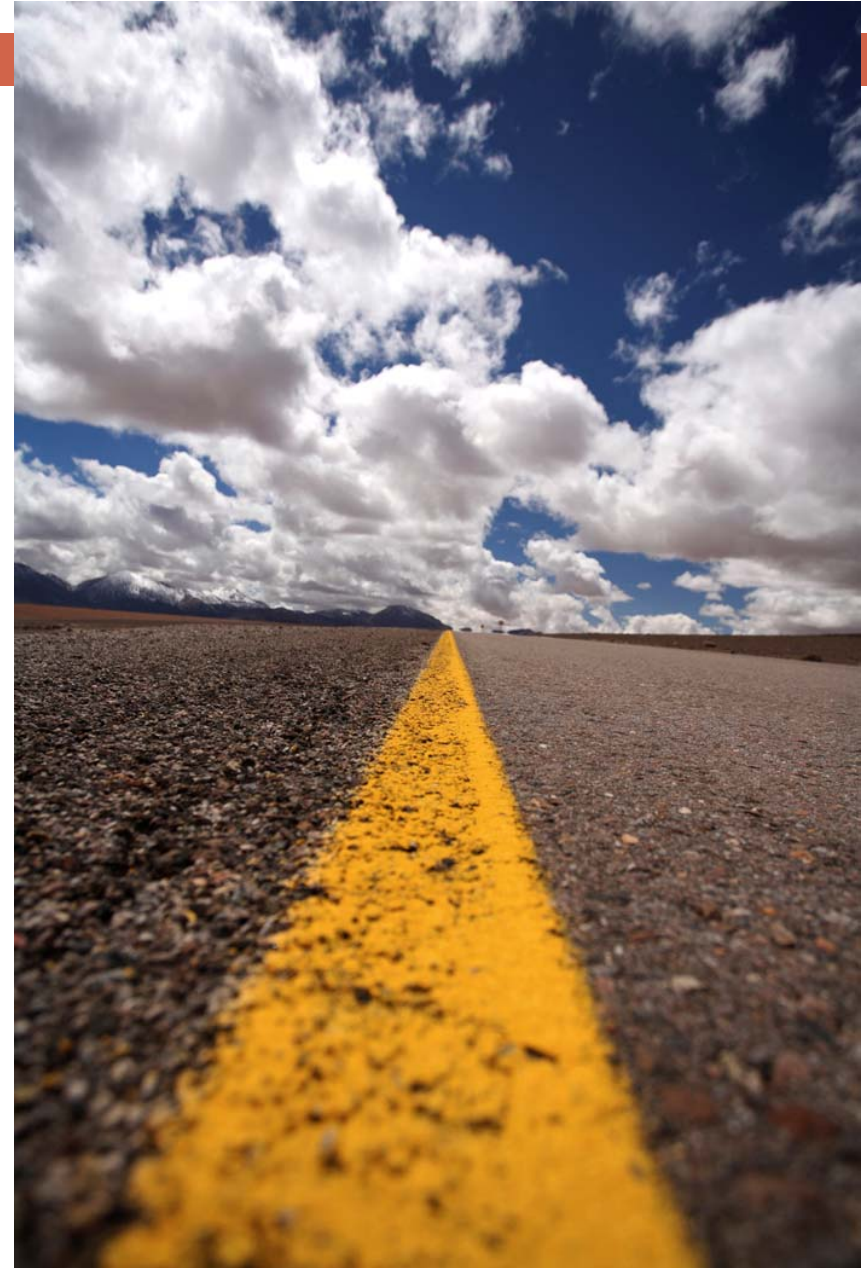


Baetis sp. larvae
(Ephemeroptera)

Ohio WQS Revision

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- Ohio's water quality standard not protective of all streams
- Revised standard 2-3 years away



Coal Mining Interim Permit Strategy

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- **General or Individual permits with**
 - **Current TDS WQS, biological monitoring, adaptive management plan**
 - **Current TDS WQS, whole effluent toxicity limit (based on both *C. dubia* and a mayfly/stonefly species), biological monitoring, adaptive management plan**
 - **Limits for sulfate and chloride (based on numeric translation of narrative standards), with or without current TDS WQS**

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Marcellus Shale Natural Gas Production

Wastewater Disposal Concerns

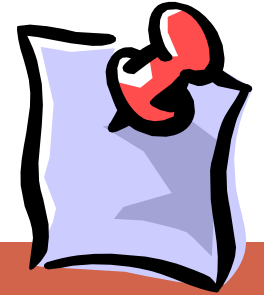


Marcellus Shale Gas Production

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- Marcellus Shale deposit extends into eastern Ohio – contains large amount of natural gas
- Use hydraulic fracturing & horizontal drilling to stimulate the wells
- **Water Resource Concerns:**
 - Hydraulic fracturing may use ~3 MG/treatment
 - Contaminants include: proprietary chemicals, brines, metals, radionuclides & organics
 - Conventional wastewater treatment is not advisable and is not effective for treating this wastewater

Heads Up for POTWs



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- **Prior to taking oil & gas well low salinity wastewaters:**
 - ▣ **Need NPDES permit modification, Antidegradation Addendum, sampling data, modify Sewer Use Ordinance (new local limits)**
 - ▣ **Submit Permit to Install application for collection/treatment equipment needed to accept wastewater**
- **City of Warren study complete, determining limits**
- **Contacting Ohio EPA early strongly recommended**

http://epa.ohio.gov/dsw/pretreatment/marcellus_shale/index.aspx

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Look Ahead

Storm Water Program Changes



Construction & Development Final Effluent Guidelines

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- **12/1/09** – New effluent limitation guidelines & new source performance standards for construction sites issued
- **2/1/10** – All construction permits issued after 2/1/10 must incorporate range of erosion & sediment controls, pollution prevention measures immediately, and as of:
 - **8/1/11** – All sites disturbing >20 acres are required to comply with turbidity limitation of **280 NTU**
 - **2/2/14** – Turbidity limitations for sites disturbing >10 acres

Industrial Storm Water

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- Industrial General Permit expires June 2011
- Exploring use of **federal multi-sector general permit**
 - ▣ Specific requirement for each industrial sector vs general SWP3
 - ▣ Submission of monitoring data for 1st time
 - ▣ Benchmark pollutant levels used in comparison with monitoring data to determine if SWP3 effective
- Draft ready for Director's review June 2010

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Great Lakes Restoration Initiative

Project Status Update



GLRI Funded Projects

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- On May 28, 2010 U.S. EPA released grant finalists
 - Will fund 270 out of >1,000 proposals
 - 28 from Ohio
 - Projects total \$161,450,000

<http://epa.gov/greatlakes/fund/2010rfp01/>

Ohio EPA's Projects

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- **Ashtabula River** Area of Concern Habitat Restoration \$1,500,000
- **Cuyahoga County** Surface Water Improvement Grants Program \$1,000,000
- **Ohio Lake Erie** Comprehensive Nearshore Monitoring Program \$1,195,000
- **Phosphorus Reduction: Variable Rate Technology** Program \$202,000
- **TMDL for Ottawa River** (Lima) Watershed \$250,000

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DSW Recent Actions

Lake Erie Phosphorus Task Force



Ohio Lake Erie Phosphorus Task Force

- Convened to analyze the increases in **dissolved reactive phosphorus (DRP)** levels and corresponding increases in algal blooms
- Both trends began to appear in the mid-1990s
- Members from agricultural interests, academia, industry, public agencies
- Evaluated point and nonpoint sources of **DRP**

Findings

- **DRP loadings are driven by runoff events**
- **Weather** trend changes: higher intensity storms, less snowfall, high winter runoff events
- **Multiple contributors; agriculture is key**
- **How and when** nutrients are applied are more of a concern than how much
 - ▣ **More fall and winter application of nutrients**

Findings

- Point sources have remained relatively consistent
- Lawn care – can have localized impact (but not a major contributor)
- **Transport mechanisms** – surface and subsurface drainage
 - ▣ Relative contribution unknown

Recommendations

- Push for “**Priority Practices**” for nutrient management
 - ▣ practices to manage method and timing of application
 - ▣ Practices that manage field runoff
- Use innovative approaches to sell these practices
- Update screening tools that account for agronomic need and environmental risk (soil tests, P Index)

No single practice will result in lower nutrient runoff

Contact Information

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