Ohio Environmental Protection Agency

Division of Surface Water

OWEA Government Affairs Workshop

March 11, 2010

Overview

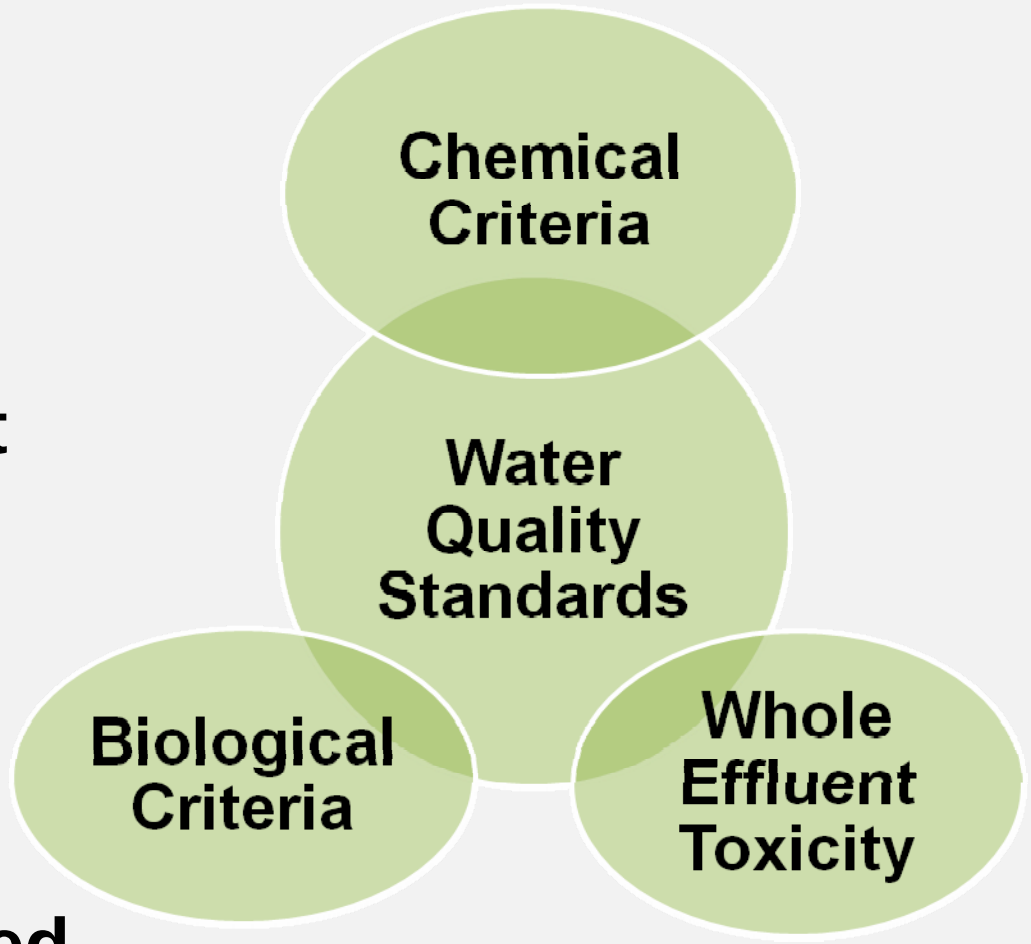
- Ohio's Biocriteria Approach
- Nutrient Criteria Update
- Draft 2010 Integrated Report
- Marcellus Shale Natural Gas Development
- U.S. EPA Updates
- DSW Program Updates – A Look Ahead

OHIO'S BIOCRITERIA APPROACH

Weight of Evidence vs. Independent Applicability
A Quick Comparison

- **Independent Applicability:**
  - **All three tools are given equal weight**

- **Weight of Evidence:**
  - **Evaluation of all available data to make most informed decision**



Weight of Evidence vs. Independent Applicability
The Costs to Achieve a Healthy Stream

- **Independent Applicability:**
  Can lead to unnecessary "fixes" and higher costs

- **Weight of Evidence:**
  Can lead to lower cost alternatives

Applications of Weight of Evidence

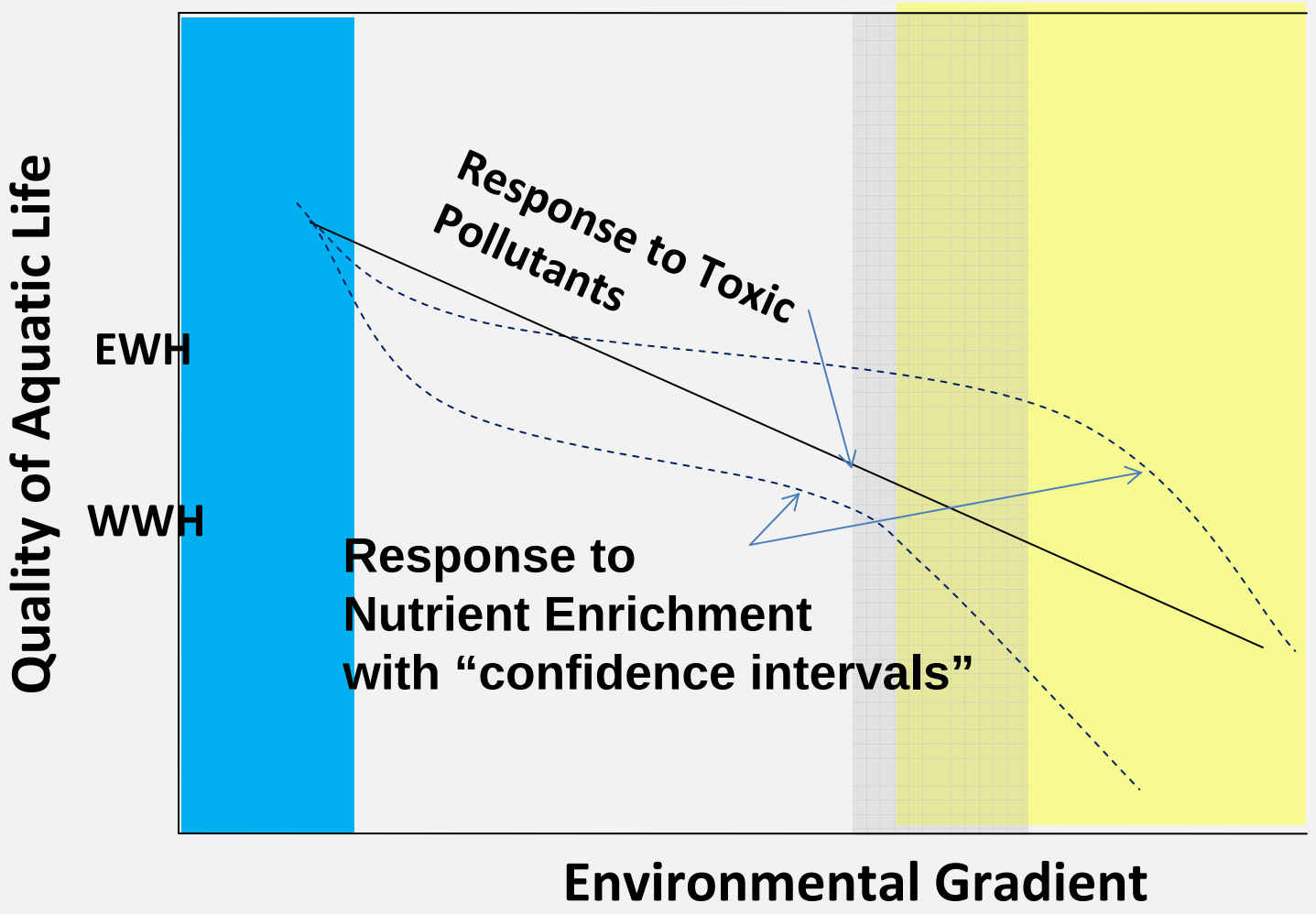
- **Establishing NPDES permit effluent limits**
  - **Rare for toxic pollutants**
  - **Key for upcoming nutrient criteria**
- **Determining aquatic life use attainment**

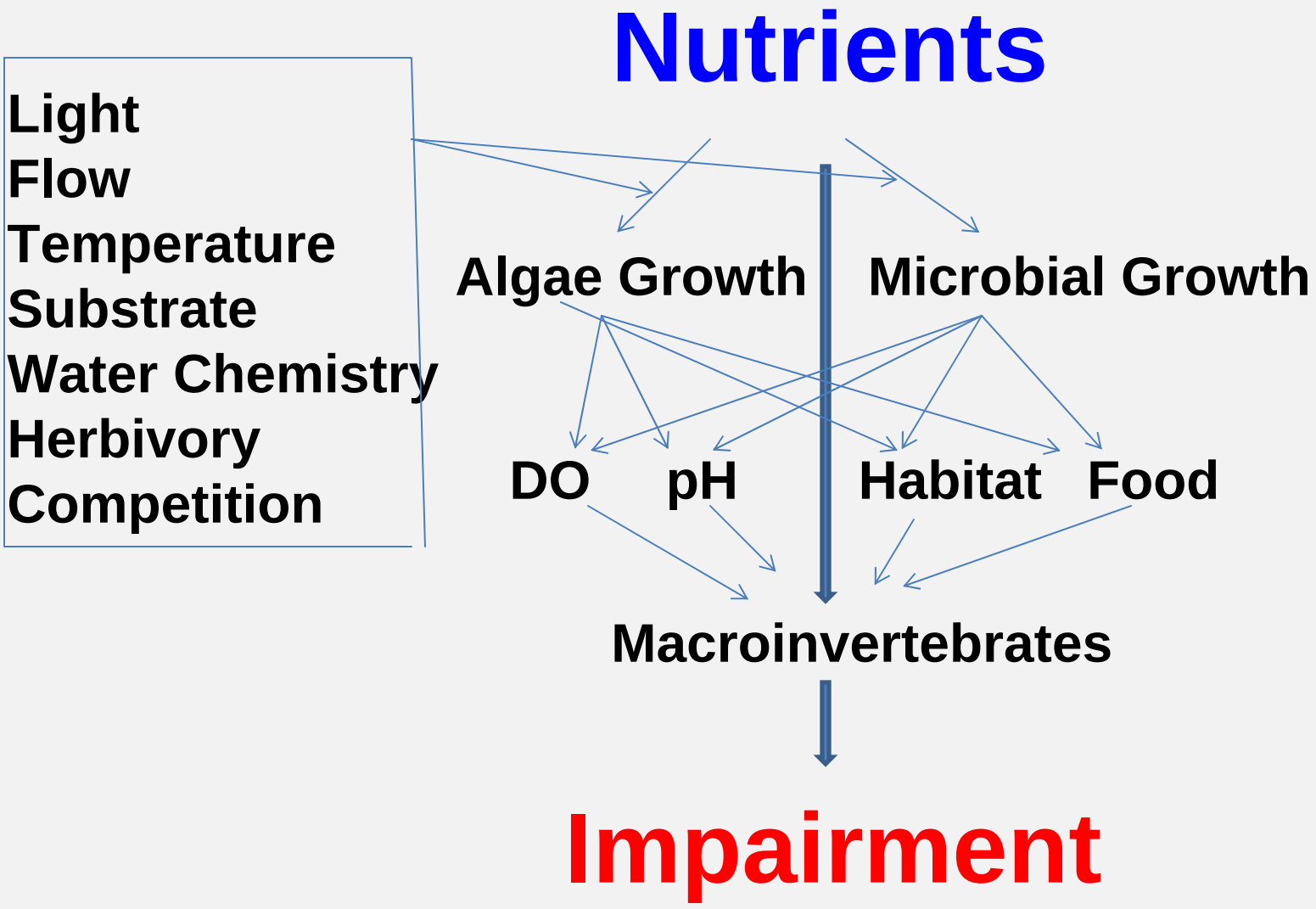
NUTRIENT CRITERIA DEVELOPMENT

The Nutrient Conundrum

- **Define criteria for natural constituents**
- **Toxics Linear dose-response model does not apply**
- **Nutrients high but aquatic life maintained, or converse**
- **Nutrient impacts not direct, impact parameters (D.O.) which impact aquatic life**
- **Balance margin of safety without being over-protective**

Biological Response to Nutrients & Toxic Pollutants





Adapted from *Empirical approaches for Nutrient Criteria Derivation* SAB Review Draft

Approach Taken in Ohio

- **Empirical Approach – field assessments on small streams/rivers <500 sq. mi.**

- **Concurrent chemical, biological measurements**
  - **Biology (fish, bugs), connected to designated uses**
  - **Habitat (channel width, morphology, canopy)**
  - **Benthic algal biomass (Chlorophyll a)**
  - **Total inorganic nitrogen**
  - **Total phosphorus**
  - **24-hour dissolved oxygen**

Effects-based Methods for Defining Nutrient Criteria

Describe relationship

nutrients vs benthic chlorophyll

- **Linear regression**
- **Change-point analysis**

Describe relationship

benthic chlorophyll vs D.O. range

- **Linear regression**
- **Change-point analysis**

Describe relationship

24 hr D.O. range vs min. DO at levels falling below WQS

- **Linear regression**

Describe relationship

D.O. range vs fish, macroinvertebrates

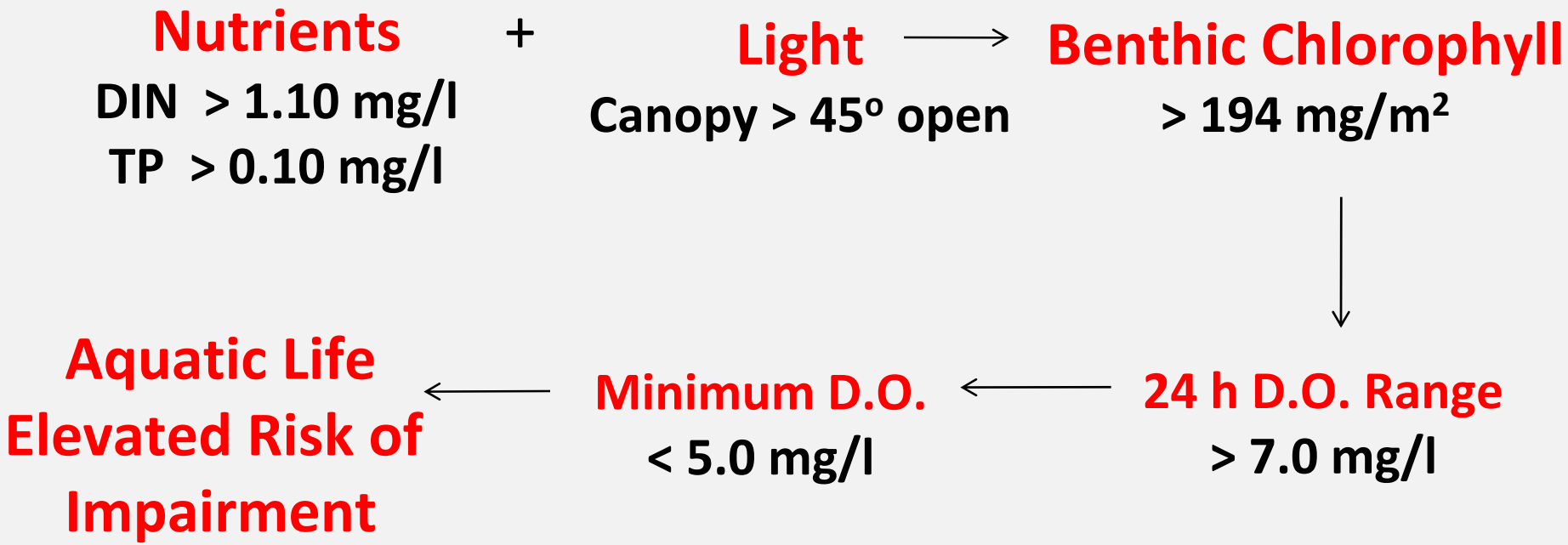
- **Linear regression**
- **Change-point analysis**

End Result

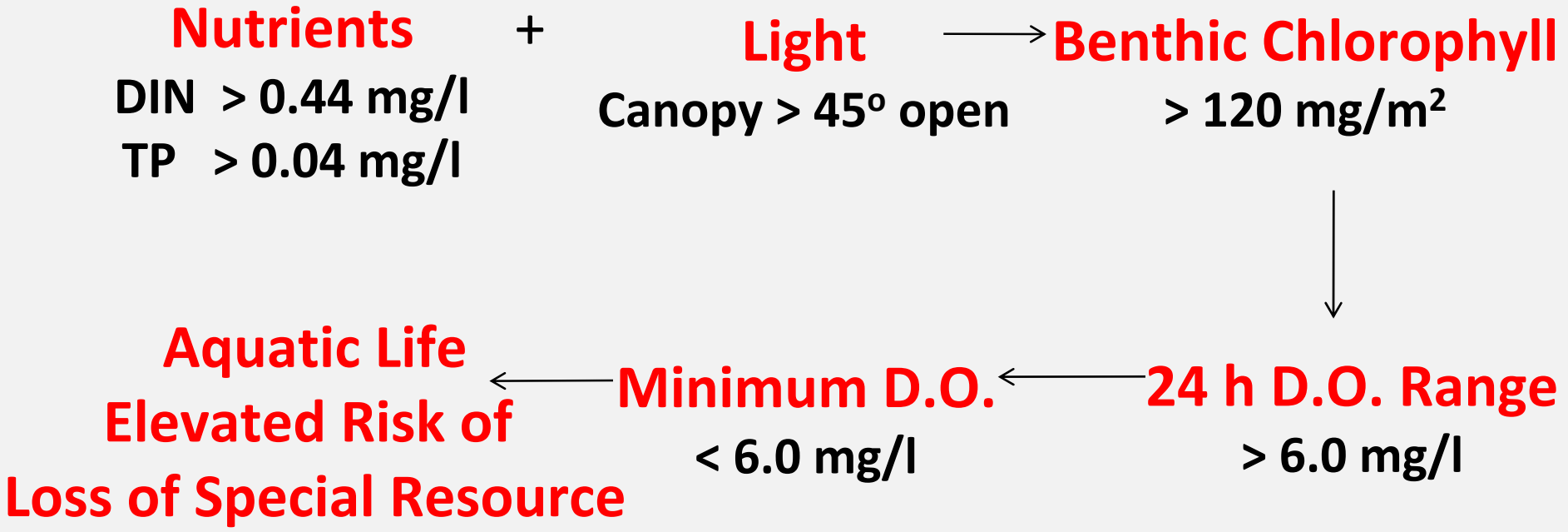
- **Detected relationships & "break point values" applied in management of nutrients on watershed scale**

Thresholds in Relationships Between Stressor & Response Variables Define Nutrient Criteria

(all streams except nutrient sensitive streams)



Thresholds in Relationships Between Stressor and Response Variables Define Nutrient Criteria (nutrient sensitive streams)



Application of Nutrient Criteria – Step 1 Confirm an Existing Problem or Threat

Is Biology Impaired or only Marginally Attaining?

Yes

No

Step 1a

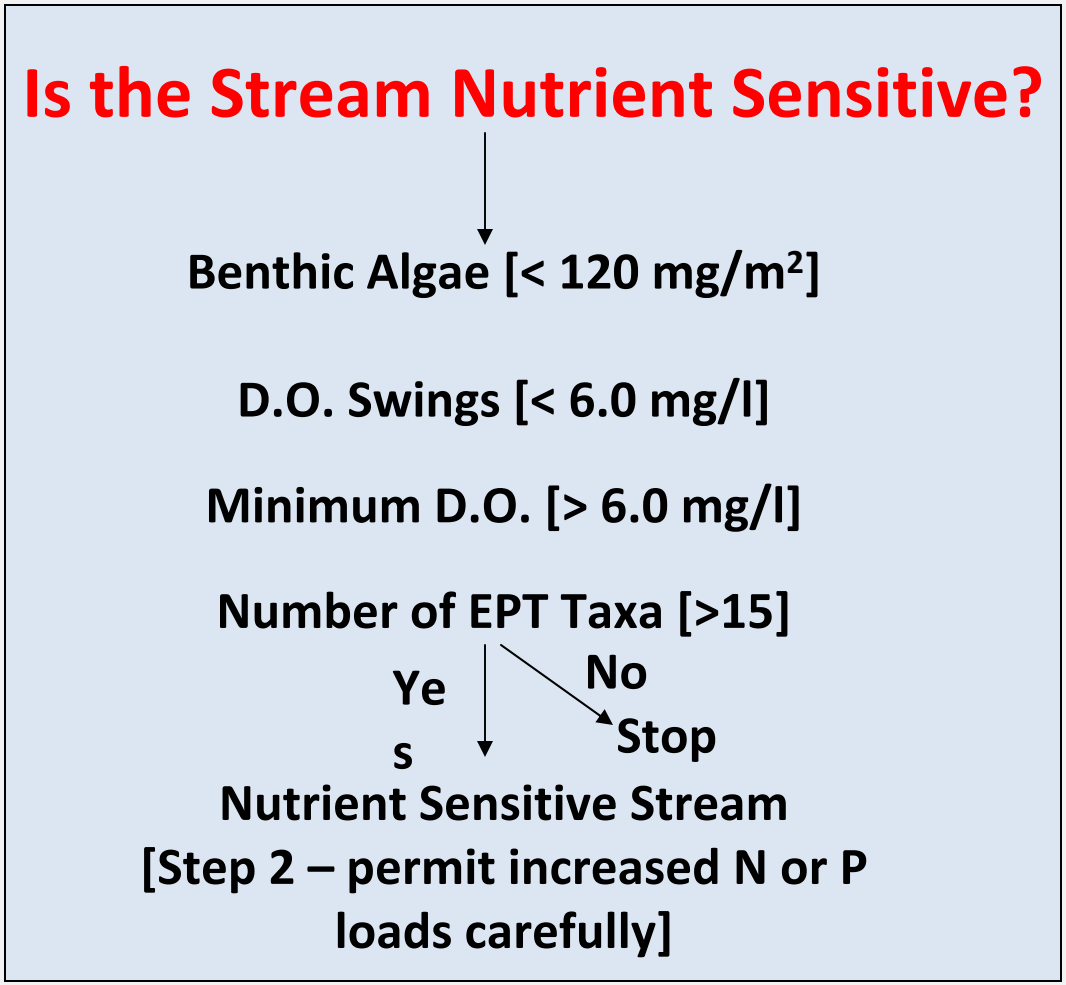
High Nutrients [> 1.10 DIN, > 0.10 TP]

Excess of Benthic Algae [> 194 mg/m^2]

Wide D.O. Swings [> 7.0 mg/l]

Nutrient Impairment confirmed
[Step 2 – derive NPDES Limit or TMDL]

Application of Nutrient Criteria – Step 1a Nutrient Sensitive Streams

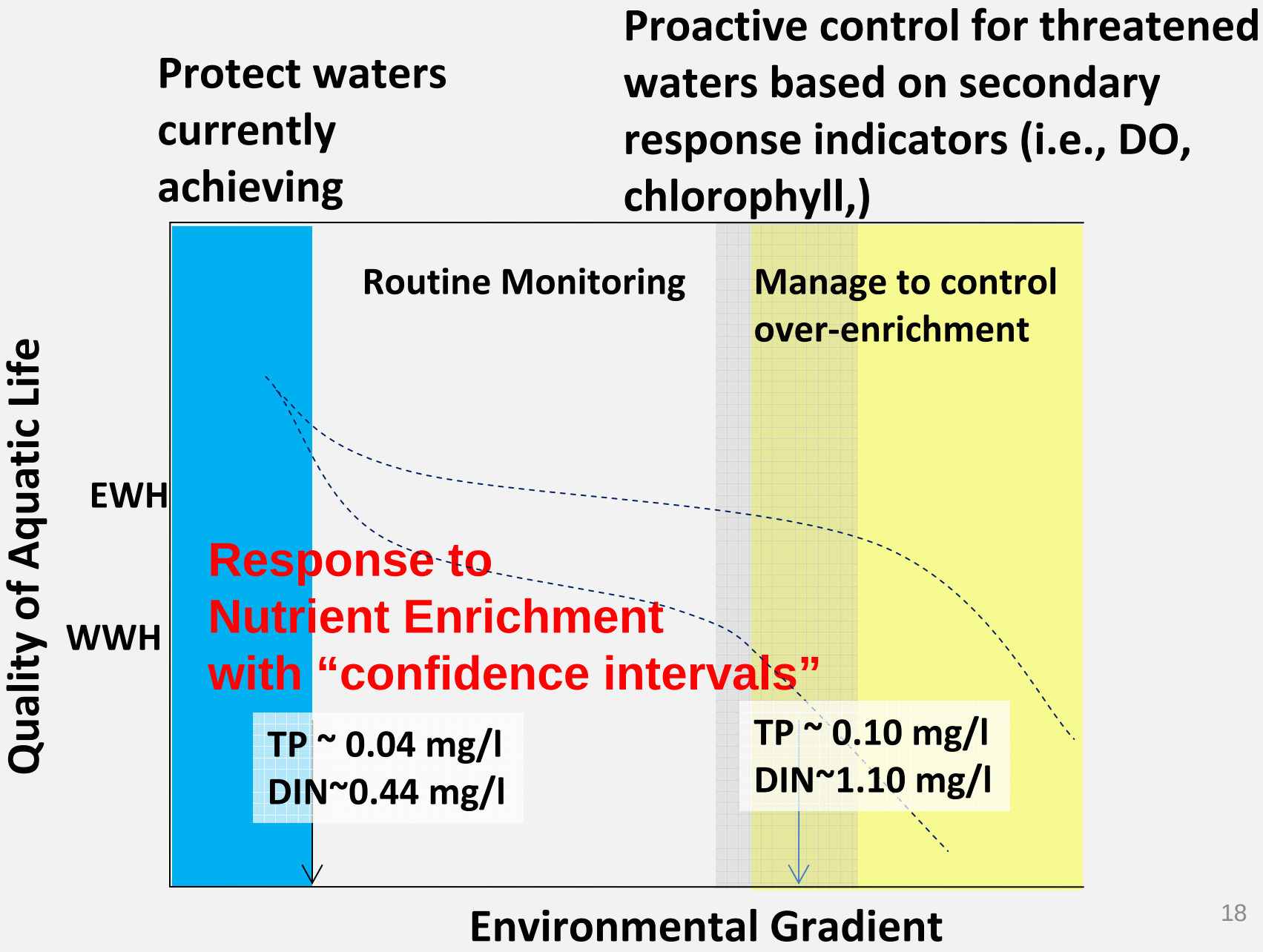


Application of Nutrient Criteria – Step 2 Implement in Management

Restore Impaired Waters		Protect Existing High Quality Waters
< 1.10 mg/l	DIN	< 0.44 mg/l
< 0.10 mg/l	TP	< 0.04 mg/l
Riparian Restoration	Light	Riparian Protection

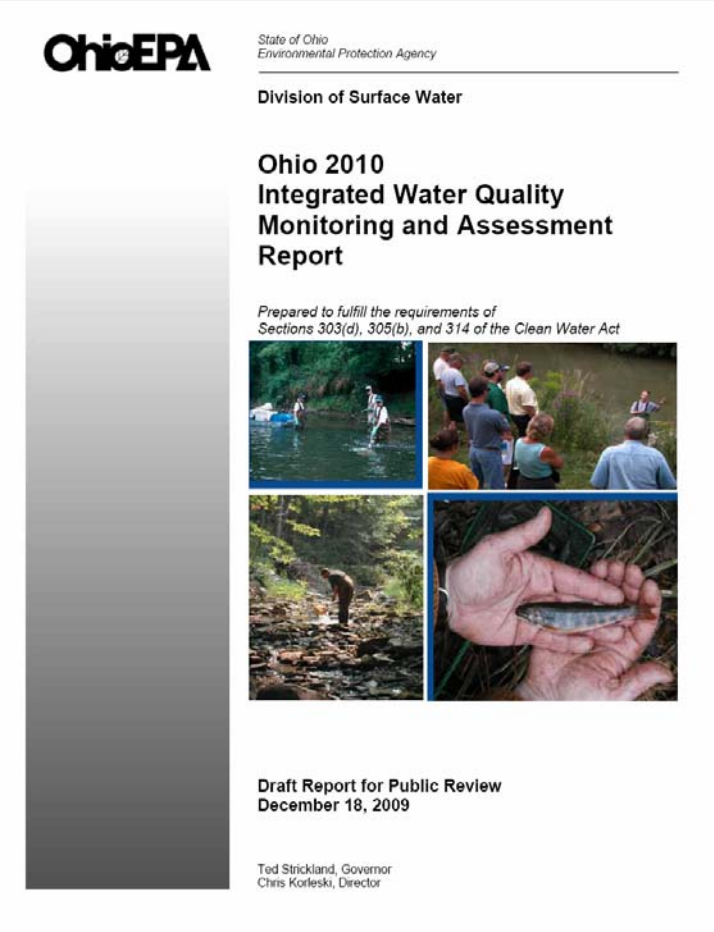
Specifics on how to implement criteria under development

Biological Response to Nutrients



Schedule

- **Small streams and rivers (< 500 sq. mi. drainage)**
  - **U.S. EPA approval**
  - **Begin rule making summer 2010**
  - **Complete rule making summer 2011**
- **Large rivers (> 500 sq. mi. drainage)**
  - **additional field work 2010 – 2012**
  - **Complete rule making in 2013**

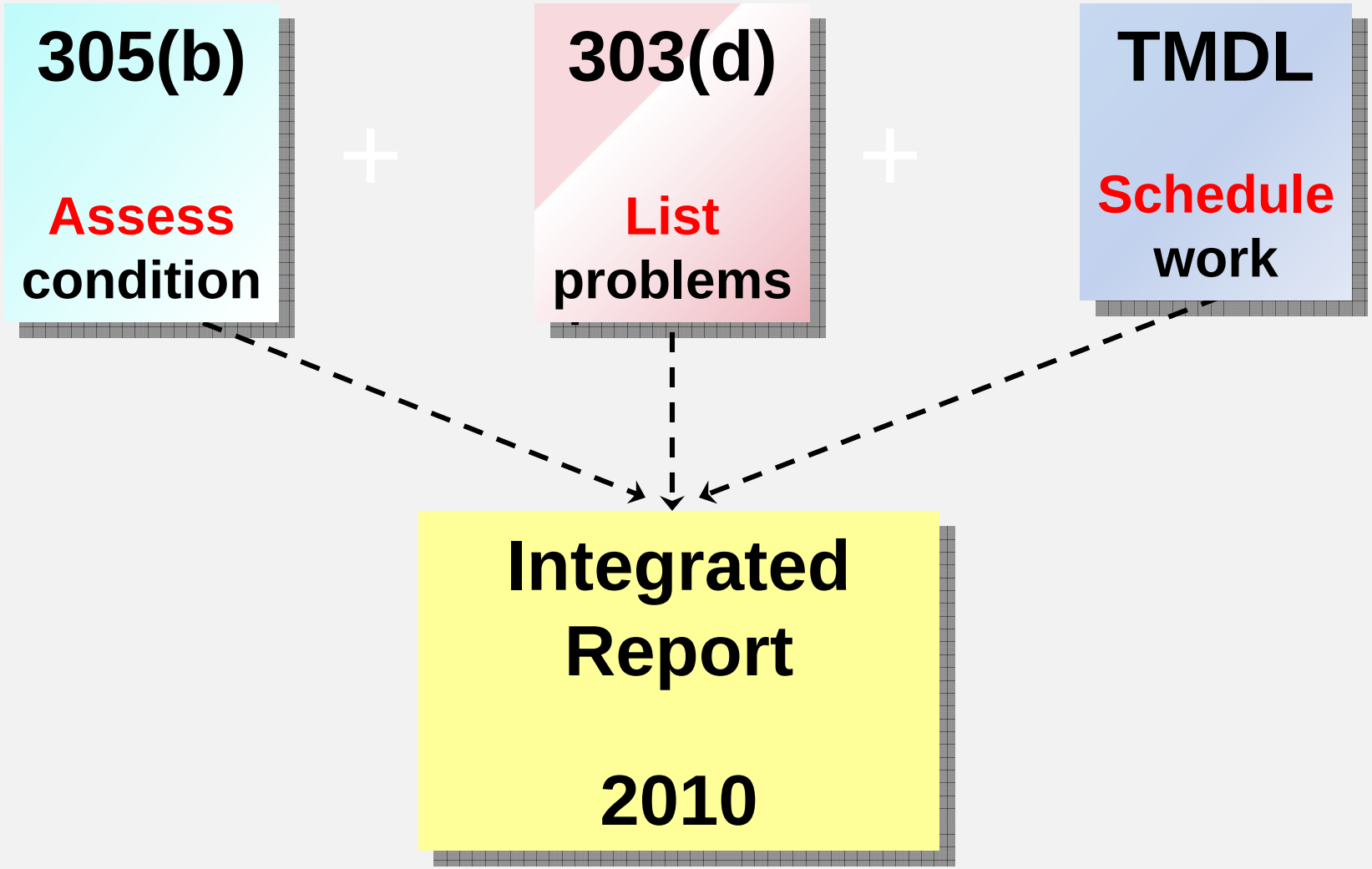


INTEGRATED REPORT

2010 Integrated Report

- **Report is required by Clean Water Act**
- **Required to report every 2 years**
- **Comment period on draft report is closed**
- **Report is due to U.S. EPA in April**

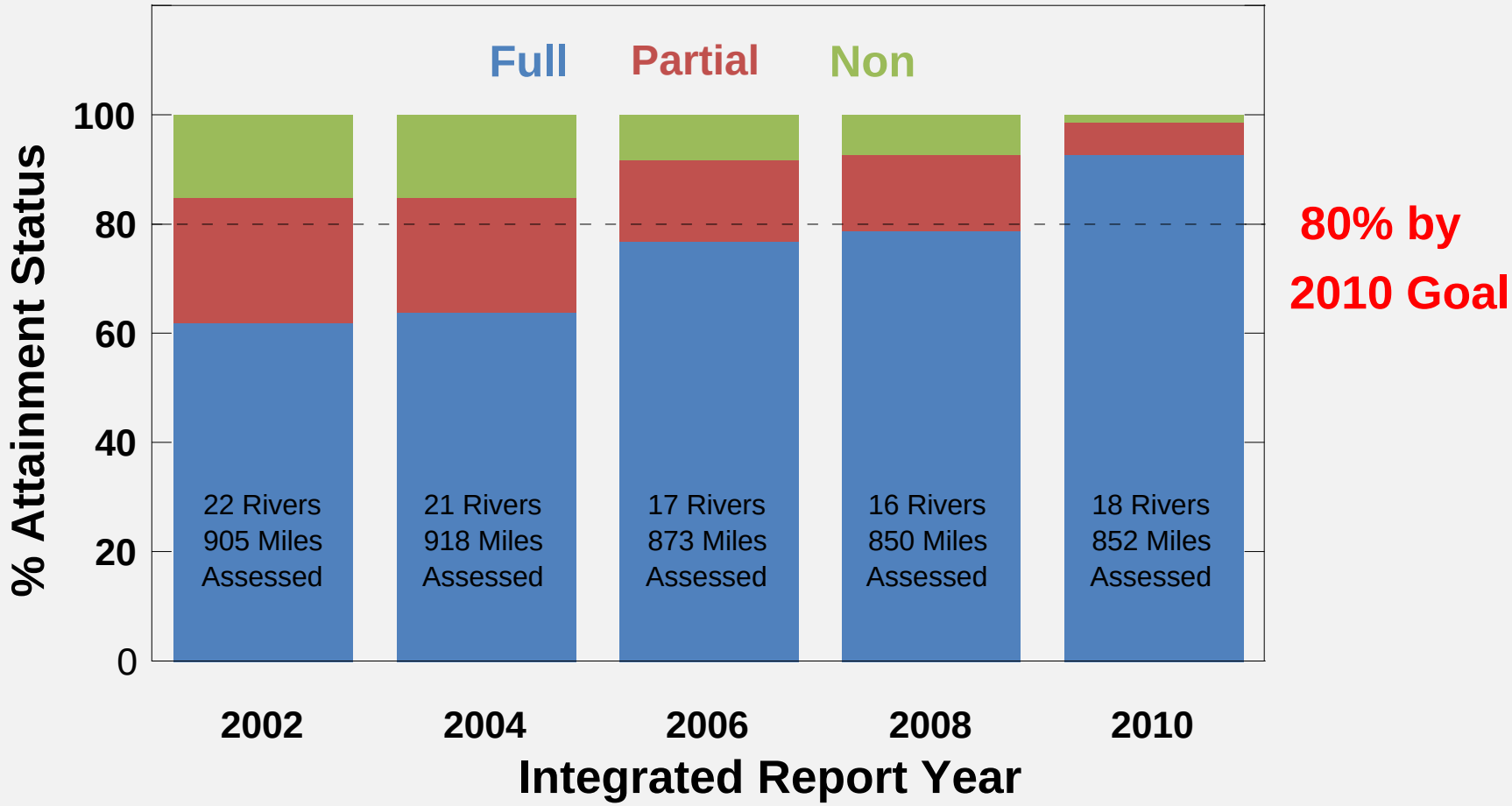
Reporting/Listing in a Nutshell



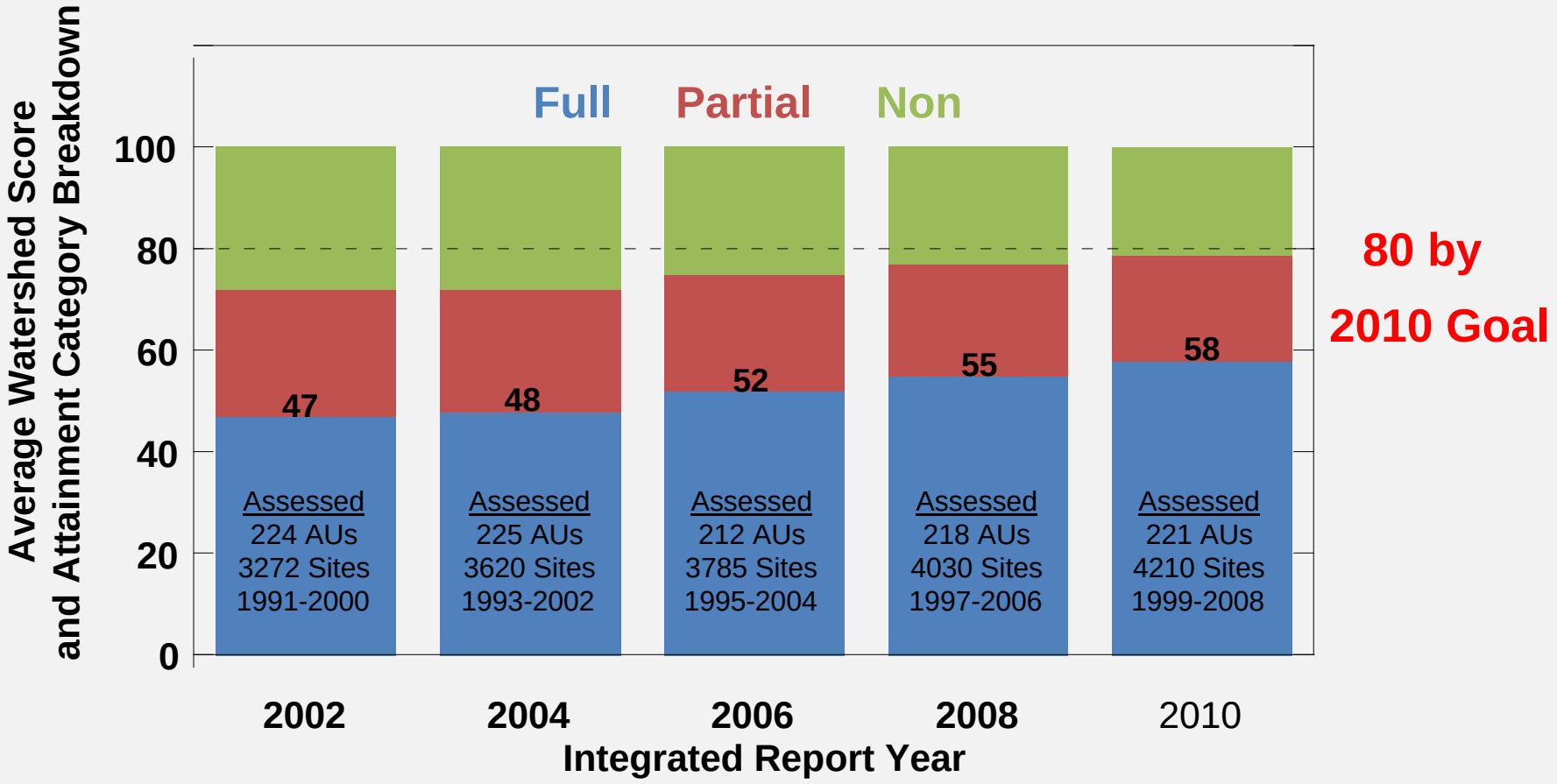
NEWS ON THE WATER QUALITY GOALS

The Good

Aquatic Life Use In Ohio's 23 Large Rivers



HUC11 Assessment Units

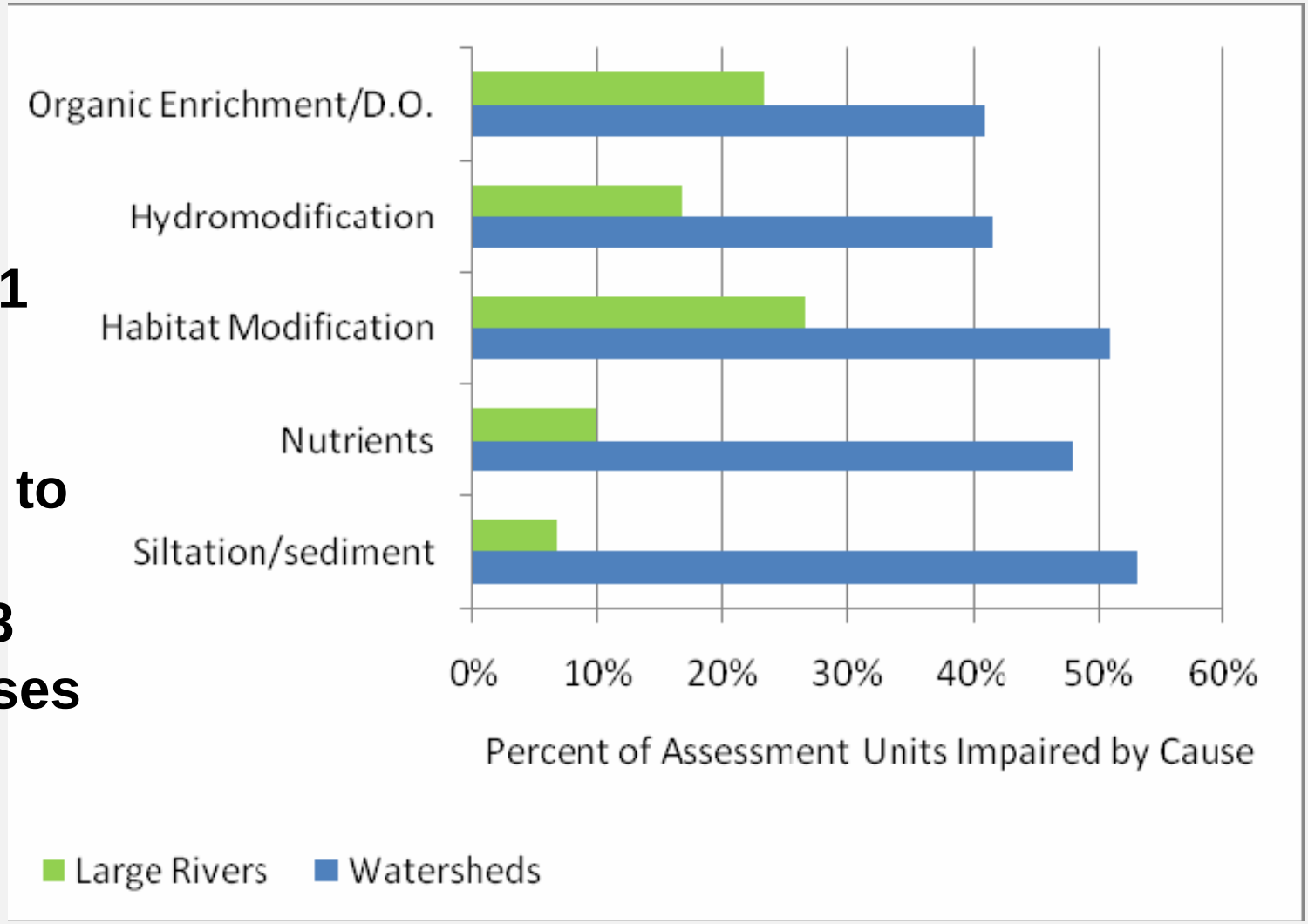


What's Causing the Problems?

Most aquatic life impairment caused by land disturbances related to agriculture activities and urban development

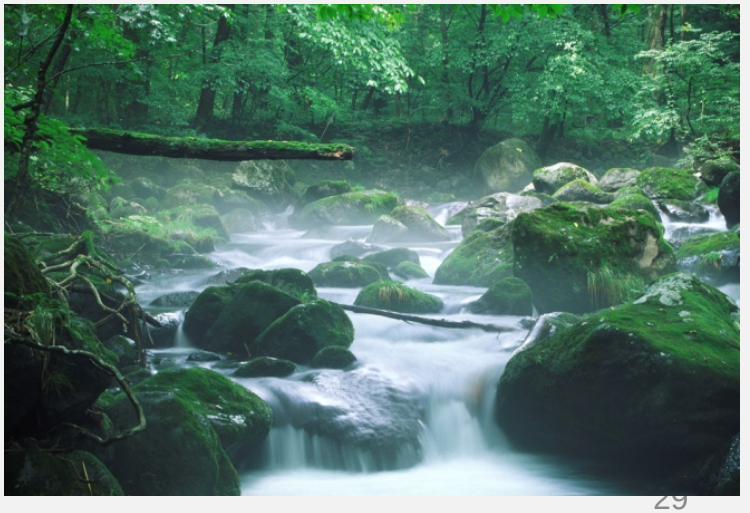
Five Common Causes

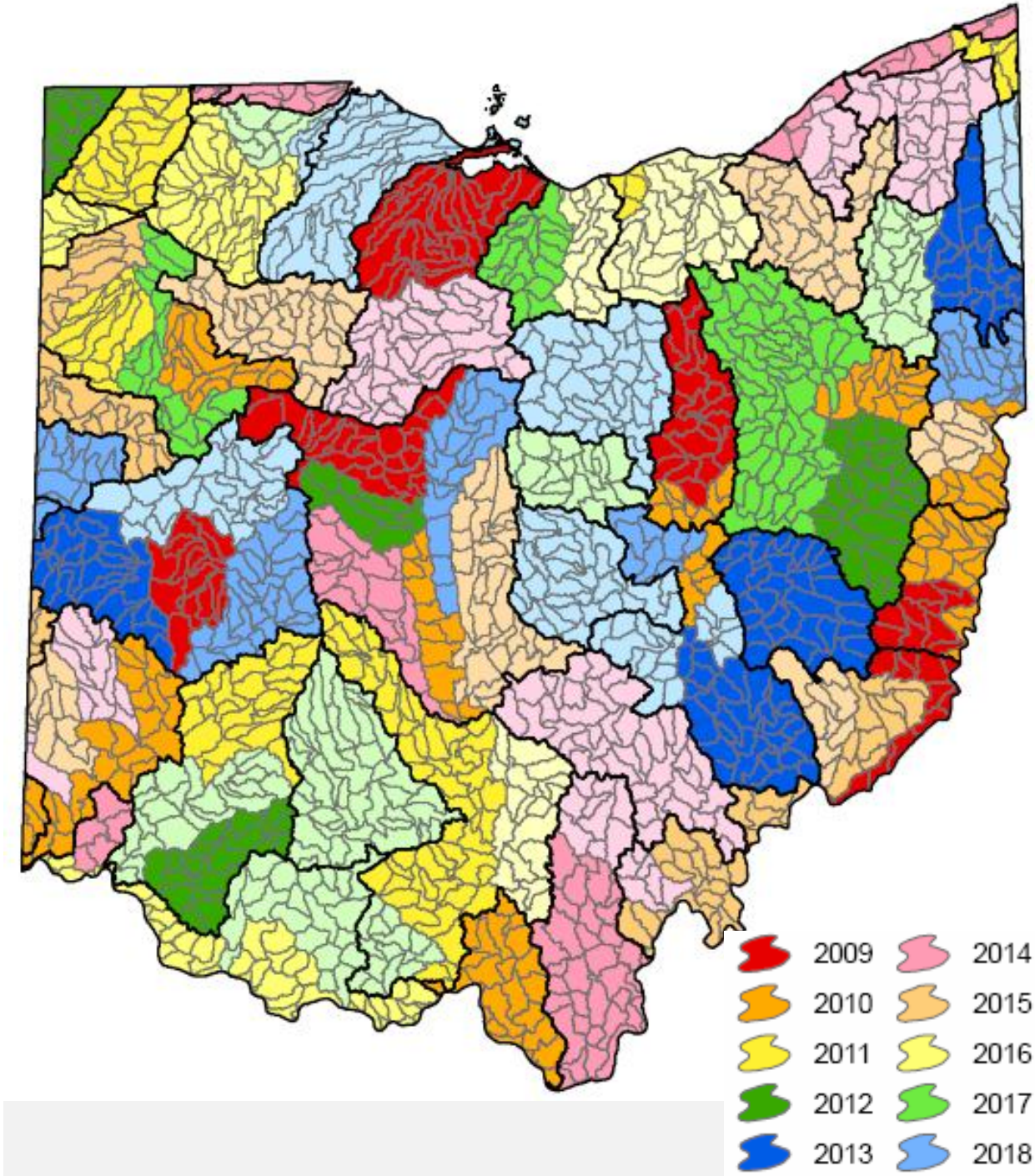
Nearly all impaired watersheds had at least 1 of these causes contributing to impairment; many had >3 of top 5 causes listed



New Goals for a New Decade

- **New aquatic life use goals for 2020**
  - **23 Large River Units: 100% full aquatic life use attainment**
  - **Watershed Assessment Units (Streams >20 mi^2 - <500 mi^2): 80% full aquatic life use**





Future Monitoring

2010

- **Ottawa Rr (around Lima)**
- **Sandy Cr**
- **Ohio Rr tribs**
- **Walhonding Rr tribs**
- **Muskingum Rr tribs**
- **Scioto Rr tribs & central mainstem**
- **Lower Great Miami Rr**
- **Whitewater Rr**

How Can I See More About My Watershed?

Go To:

http://epa.ohio.gov/dsw/tmdl/2010IntReport//assessment_summaries.aspx

Division of Surface Water Watershed Assessment Unit Summary

Overview Information

Click to view a glossary of terms

Assessment Unit Name: Baldwin Creek-East Branch Rocky River
Hydrologic Unit Code: 04110001 02 02
Assessment Unit Size: 36.6 square miles
Priority Points: 6
Monitoring Scheduled: 2021
TMDL Scheduled: 2024

Land Use Statistics:

Developed	Forest	Grass/Pasture	Row Crops	Other
61.5%	28.5%	1.0%	0.3%	8.6%

Aquatic Life Use Assessment

Reporting Category: 5x
Aquatic Life Uses: WWH
Sampling Years: 1997, 2001
Watershed Score: 48.0

Causes of Impairment:

- chlorine
- direct habitat alterations
- flow alteration
- nutrients
- organic enrichment/DO
- siltation
- unionized ammonia

Sources of Impairment:

- channelization - development
- flow regulation/modification - development
- highway/road/bridge/sewer line
- land development/suburbanization
- marinas
- municipal point source
- streambank modification/destabilization - dev
- urban runoff/storm sewers (NPS)

Comments: None

Recreation Use Assessment

Reporting Category: 3
Assessment Unit Score: Not calculated

Public Drinking Water Supply Assessment

Reporting Category: 1
Cause of Impairment: None
Nitrate Watch List: Yes
Pesticide Watch List: No

Fish Tissue Assessment

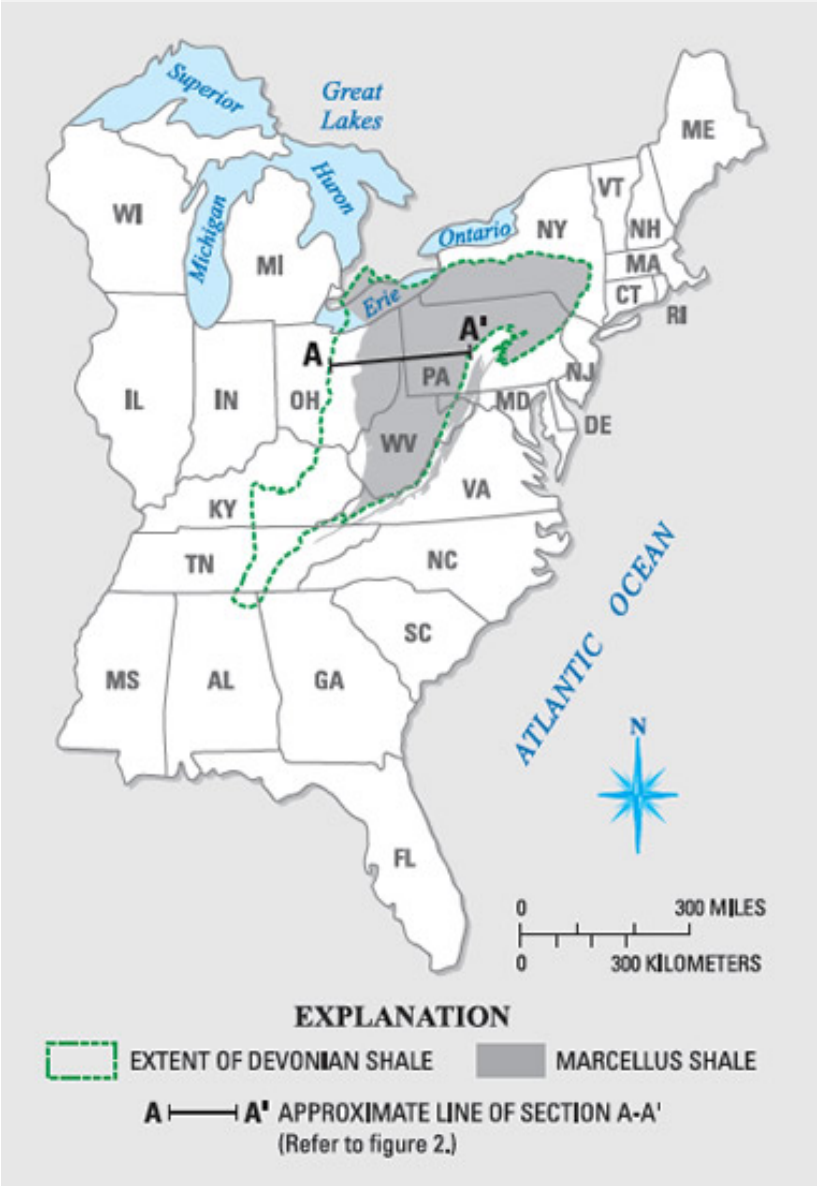
Reporting Category: 5
Causes of Impairment: PCBs
PCB Concentration: 38 ppb

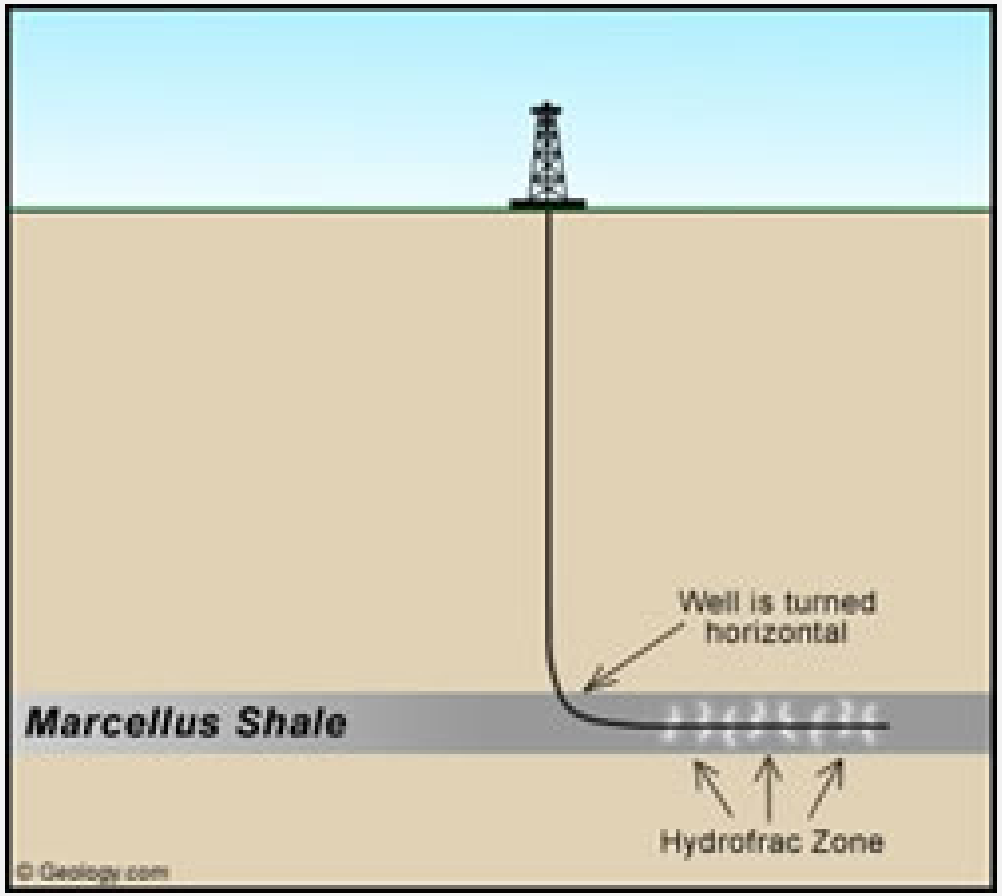
MARCELLUS SHALE NATURAL GAS PRODUCTION

Marcellus Shale Gas Production

- **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:**
  - **Water usage impact on local water resources**
  - **No environmentally sound method for disposal of contaminated liquids recovered from well construction**
  - **Heavy equipment usage impact on watersheds & streams**

Marcellus Shale Gas Production





Graphics from:
http://geology.com/usgs/marcellus-shale

Marcellus Shale Gas Production

Wastewater Disposal Concerns

- **Hydraulic fracturing may use ~ 3 MG/treatment**
- **Water must be recovered & disposed**
- **Contaminants include:**
  - **proprietary chemicals,**
  - **brines, metals,**
  - **radionuclides & organics**

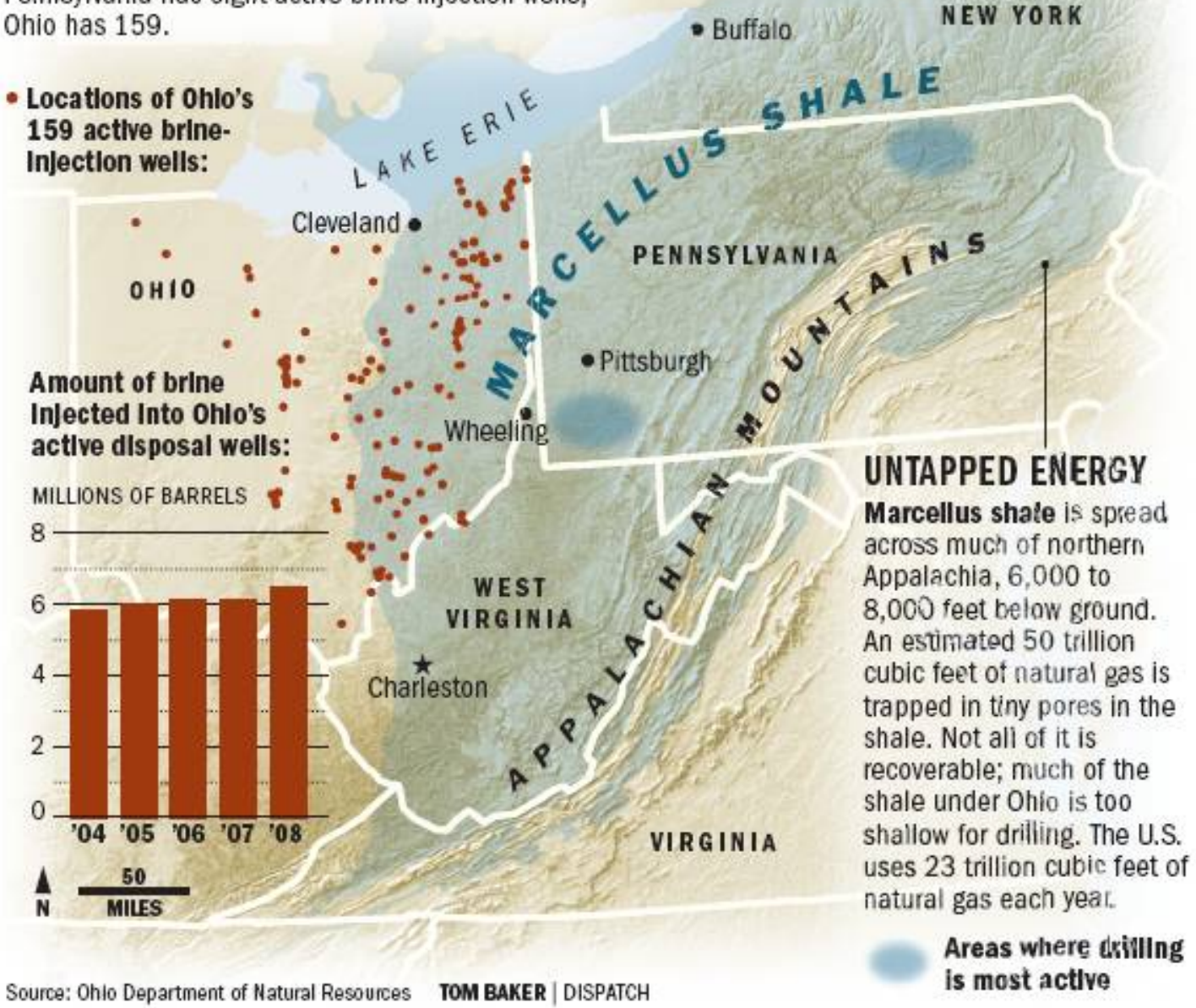
Marcellus Shale Gas Production

Wastewater Disposal Concerns

- **High salinity wastewater must be injected in Class II injection wells**
- **Disposal options for low salinity wastewater include deep injection and WWTP**
- **Conventional wastewater treatment is not advisable and is not effective for treating this wastewater**

Brine-injection wells

Ohio officials fear increased natural-gas drilling in Pennsylvania will send millions more gallons of salty wastewater, called brine, into Ohio. The amount of brine pumped from Ohio oil and gas wells has risen with increased drilling and production. Pennsylvania has eight active brine injection wells; Ohio has 159.



Source: Ohio Department of Natural Resources **TOM BAKER** | DISPATCH

Heads Up for POTWs

- **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**
- **Contact Ohio EPA early strongly recommended**
- **Warren conducting 8-week pilot project, will increase to 100,000 gpd low salinity wastewater**

U.S. EPA UPDATES

Proposed FY2011 Budget

- **Protecting America's Waters**
  - **$300 million for Great Lakes**
  - **$63 million for Chesapeake Bay protection & restoration**
  - **$17 million for Mississippi River Basin non-point source control implementation recommendations of Nutrients Innovation Task Group & Gulf of Mexico Hypoxia Action Plan**
  - **$2 billion for Clean Water State Revolving fund**
  - **$10 million for green infrastructure research**

Rulemaking Gateway

- **U.S. EPA launched new Web site to encourage participation in agency rulemaking process**
  - **Searchable based on specific interests**
  - **Provides information as soon as work begins**
  - **Updated monthly**
  - **Public meetings updated daily**
  - **Includes discussion forum for site enhancements**
- **http://www.epa.gov/rulemaking/**

National Enforcement Initiatives FY 2011-13

- **U.S. EPA 10/15/09 plan includes three goals:**
  - **Aggressively go after pollution problems that make a difference in communities**
    - **Clean water action plan: focus on biggest pollution problems, including:**
      - **Get raw sewage out of water**
      - **Cut pollution from animal waste**
      - **Reduce polluted storm water runoff**

National Enforcement Initiatives FY 2011-13

- **Reset relationship with states**
  - **Shared accountability – new model**
  - **Strengthened oversight**

National Enforcement Initiatives FY 2011-13

– **Improve transparency and accountability**

- **Make meaningful facility compliance information available & accessible using 21st century technologies**
- **Hold government accountable through public information on state & federal performance**
- **Promote better federal environmental decisions and public engagement**

National Enforcement Initiatives FY 2011-13

- **Will use goals to address:**
  - **Municipal Infrastructure – reduce discharges from CSOs, SSOs & MS4s**
  - **Concentrated Animal Feeding Operations (CAFOs) - initiate enforcement against facilities discharging without a permit**
  - **Mining and Mineral Processing – bring facilities into compliance to protect environment and communities**
  - **Energy Extraction Sector – assure compliance with environmental laws**

A Look at What's Ahead

DSW PROGRAM UPDATES

Industrial Storm Water

- **Industrial General Permit expires June 2011**
- **Exploring use of federal multi-sector general permit**
  - **Specific BMPs for each industrial sector vs general SWPPP**
  - **Submission of monitoring data for 1st time**
  - **Benchmark pollutant levels used in comparison with monitoring data to determine if BMPs effective**
- **Public noticing draft in June 2010**

Construction & Development Final Effluent Guidelines

- **12/1/09 - New effluent limitations guidelines & source performance standards for construction sites**
- **1/1/10 - All permits must incorporate range of erosion & sediment controls, pollution prevention measures**
- **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**

401/Wetlands Kaizen Event

- **Kaizen process undertaken by DSW to improve process for issuing 401/wetland permits**
  - **improving the efficiency of permitting process**
  - **Ensuring protection of Ohio's aquatic resources not sacrificed for expediency**
- **Results include:**
  - **Application manual**
  - **Preapplication**
  - **Tiered application review**
  - **Web based feedback**

New *E. coli* Water Quality Standards

- **New Recreation Use rules adopted 12/15/09, eff. 3/15/10**
- **Changes made:**
  - **Recreation season changed - May 1st - October 31st**
  - **Fecal coliform dropped**
  - **Authority to extend effluent disinfection season**
  - **Definitions- Bathing Waters, Primary Contact, Secondary Contact**
  - **Primary Contact divided Class A, B, C – different *E. coli* criteria**

Potential NPDES *E. coli* Limits

Recreation Use	Class	*E. coli* (colonies/100 ml)	
		30-day avg	7-day avg
Bathing Waters		126	284
Primary Contact	Class A	126	284
	Class B	161	362
	Class C	206	464
Secondary Contact		1030	2318

2010 Inland Lakes Sampling

- Lake Vesuvius - Lawrence Co.
- Metzger Reservoir - Allen Co.
- Beaver Creek Reservoir – Seneca Co.
- Akron Water Supply reservoirs (E. Br., LaDue, Rockwell)
- Barnesville – Belmont County (3 reservoirs)
- Woodsfield – Monroe Co.
- Griggs Reservoir – Franklin Co.
- O'Shaugnessey Reservoir – Delaware Co.
- Kiser Lake – Champaign Co.
- Lake Loramie – Shelby Co.

GREAT LAKES UPDATE

Toledo Harbor Dredging

401 Certification History

- **1987 – OEPA, USEPA indicates open lake disposal of sediment unacceptable**
- **1987-now – OEPA issued 401 certifications temporarily allowing lake disposal while alternatives developed**
- **Appeals settlement 2005**
  - **W. Basin MOA – USACE/OEPA/ODNR Habitat Restoration Units**
  - **2006/2007 - Open lake placement of 600,000 yd^3 /yr**
  - **WQ investigation - fish impacts of dredging activities on fishes**
  - **Restricts environmental window for dredging**
- **8/08, 3/09 – Draft new rules out for public comment**

Ending Open Lake Disposal

- **Phase One**
  - **Use existing CDF facilities**
    - **Raise berms CDFs, beneficial reuse, seek added funding**
- **Phase Two**
  - **Implement Habitat Restoration Unit or other disposal & beneficial reuse methods that can deal with the huge volume of dredged materials**
- **Phase Three**
  - **Implement watershed management plan for W. Lake Erie to decrease solids to Toledo Harbor and shipping channel**

All three phases have to proceed concurrently

Great Lakes Restoration Initiative

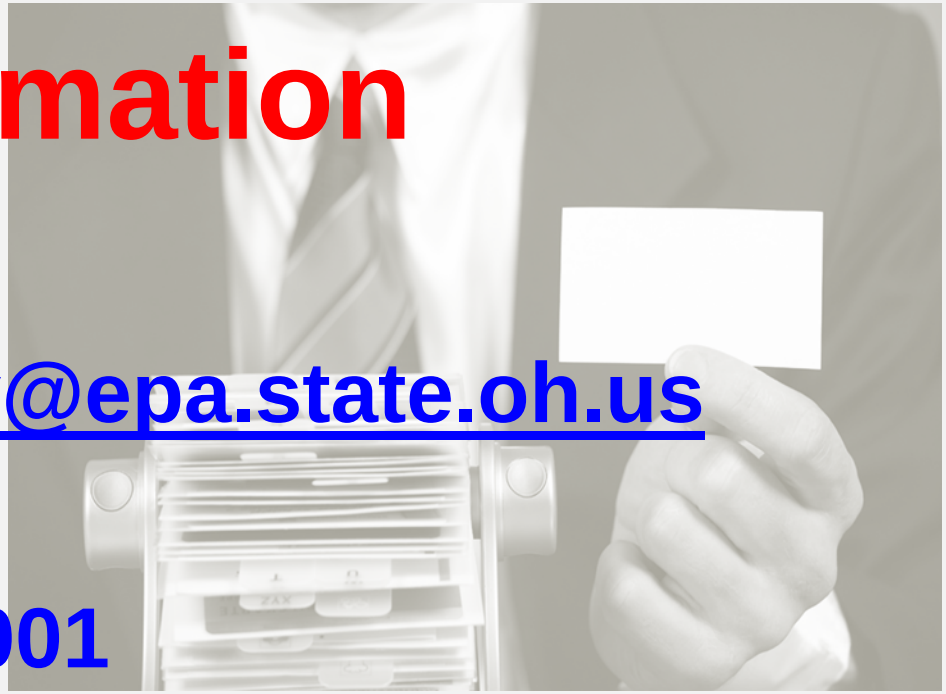
- **Ohio is participating in Great Lakes restoration $120 million RFP released in November 2009**
- **Ohio applied for funding for projects in following categories:**

Category	Funding Request & # of Projects
Toxic Substances & Areas of Concern	$1.157 million for 4 projects
Invasive Species	$0.961 million for 3 projects
Nearshore Health & Nonpoint Source Pollution	$5.981 million for 13 projects
Habitat & Wildlife Protection & Restoration	$14.3 million for 8 projects
Accountability, Monitoring, Evaluation, Communication & Partnerships	$1.225 million for 4 projects

GLRI – Projects w/ OEPA Lead

Ashtabula River: Ashtabula AOC 5 ½ Slip Peninsula Habitat Restoration	Maumee River: Phosphorus reduction in Lake Erie Western Basin – Variable Rate Technology for Cover Crop Seeding
Lake Erie: Ohio Nearshore Monitoring Program	Maumee River: Phosphorus reduction in Lake Erie Western Basin cover crop seedings
Basin Wide: TMDL Assistance	Cuyahoga and Chagrin rivers: Cuyahoga County Surface Water Improvement Fund grants program
Basin Wide: Mercury variance study	

Contact Information



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