Wetlands Monitoring: The Big Picture

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The First Law of Thermodynamics
(Ainslie’s Corollary)

• Confusion is neither created nor destroyed but merely changes form!

Loose Translation: What up?
Where Do Wetlands Fit In?

Clean Water Act Purpose:

“restore and maintain the chemical, physical, and biological integrity of our nation’s waters”
Where Do Wetlands Fit In?

• Wetlands **ARE** Waters of the U.S.
• Waters of the U.S. include:
  • all interstate waters, including interstate wetlands
  • all other waters such as intrastate lakes, rivers, streams, including intermittent streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce (used by travelers for recreation or other purposes, used for industrial purposes in interstate commerce, from which fish or shellfish are or could be taken and sold in interstate or foreign commerce,)
  • all impoundments of waters
  • tributaries of waters
  • territorial seas
  • wetlands adjacent to waters
Where Do Wetlands Fit In?

☒ States and Tribes will report (§305(b) of the CWA) on the condition of waters of the U.S., which includes wetlands. (Lawsuits for lack of wetland monitoring in DE and PA)

☒ Only 4% of the Nation’s wetlands are monitored and reported in the 305(b) report
Where Do Wetlands Fit In?

- Review/Revise WQS (§ 302(c))
- Monitor and Assess (§305(b))
- Are Waters Meeting WQS? (Non-Attainment waters are listed) (§303(d))
- Prioritize/Rank/Target Waterbodies (reach program goals - WQS, sediment reduction, restoration)
- Implement Management Measures
- Monitor and Assess (§305(b))
Where Do Wetlands Fit In?

- Protect wetlands at the same level within all water programs as other waters of the U.S.
- Sec. 401 Guidance (April 1990) (Biologic Criteria for Surface Waters)
- National Guidance for WQS for Wetlands (July, 1990)
- Wetland WQS Guidance FY91-FY93
- Sec. 305(b) Guidance and Reports
- Efforts hampered by lack of tools and information (e.g., a template for wetland water quality standards)
- Development of wetland monitoring methods
- 2002 Integrated Water Quality Monitoring and Assessment Report Guidance
Where Do Wetlands Fit In?

As of 1993 States were required to include in their Water Quality Standards:

- A Definition of Wetlands
- Narrative Criteria for Wetlands
- Numeric Criteria for Wetlands
Where Do Wetlands Fit In?

**Iowa**

**Current Wetland Definition**
Designated uses for wetlands and lakes are defined as “are artificial and natural impoundments with hydraulic retention times and other physical and chemical characteristics suitable to maintain a balanced community normally associated with lake-like conditions.

**Current Narrative Wetland Criteria**
Wetlands and lakes are subject to criteria for general use waters, plus protection for wildlife watering, aquatic life, and secondary contact water uses.

**Current Numeric Wetland Criteria**
Included are limits for specific pollutants applied to the designated use classification of “lakes/wetlands.”
Kansas
Current Wetland Definition
“Wetlands, including waterbodies meeting the technical definition for jurisdictional wetlands given in the “corps of engineers wetlands delineation manual,” as published in January 1987, which is hereby adopted by reference.” But, only those that are publically owned are WOS.

Current Narrative Wetland Criteria
No specific narrative criteria.

Current Numeric Wetland Criteria
No numeric criteria.
Where Do Wetlands Fit In?

Missouri

Current Wetland Definition
Use EPA and Corps definition of wetlands, as defined in their Section 404 regulations. Wetlands are delineated by using the criteria in the 1987 Corps of Engineers Wetland Delineation Manual.

Current Narrative Wetland Criteria
No specific narrative criteria, only those which apply to all Waters of the State (WQS)

Current Numeric Wetland Criteria
Existing numeric criteria for WQS
Where Do Wetlands Fit In?

Nebraska

Current Wetland Definition
“Wetlands are characterized by extreme variations in hydrology, soils, vegetation, water quality, and biotic assemblages.” (Title 117 Chap. 8, §001)

Surface water overflow wetlands and isolated wetlands are two identified categories.

Wetlands identified and delineated using methods contained in the “COE Delineation Manual.” (Title 117, Chap. 8, §003)

Current Narrative Wetland Criteria
General criteria are “based on natural background values for traditional water quality parameters,” but “shall be no more stringent than those associated with Class B Warmwater Aquatic Life classification or the General Criteria for Aquatic Life...” “The biological integrity of wetlands shall be maintained and protected.” No significant adverse impacts to key species, which are identified as Threatened and Endangered Species.

Toxic substance criteria provided for wetlands that can result in acute or chronic toxicity to aquatic life.

Current Numeric Wetland Criteria
Numeric criteria dependent on water to be measured are not applicable during dry periods. Standards do not apply to artificial wetlands constructed for treatment purposes.
Where Do Wetlands Fit In?

- Lack of wetland-specific water quality standards, and in cases an adequate definition of wetlands
- Lack of wetland data in 305(b) reports (public vs. private wetlands)
- Some data on quantity, but little on the quality or condition of wetlands
How Do Wetlands Fit In?

What is CALM?
(Consolidated Assessment and Listing Methodology)

• **Concept** - Better documented, defensible assessments and decisions about water quality standards (WQS) attainment and impairment

• **Basics:**
  - water quality monitoring strategies
  - data quality and quantity needs, and
  - data interpretation methodologies

• **Addresses**: questions regarding relationship of WQS, 305(b) assessments, and 303(d) lists of impaired under existing regulations
How Do Wetlands Fit In?

- Historic wetland losses
  - Iowa: 89%    Kansas: 48%
  - Missouri: 87%    Nebraska: 35%
- Essential to healthy watersheds - INTERSTATE
- Essential to Water Quality
- Erosion and Flood Control
- Loss of aquatic functions and values on the landscape
  - biodiversity
  - fish and wildlife declines - amphibians, reptiles
How Do Wetlands Fit In?

Watershed Applications of Wetland Assessments

Are we offsetting wetland losses, functions, and values in the watershed? Take a step back and look at the BIG PICTURE! Wetlands Monitoring is needed to ….

- Integrate with existing landscape level and watershed planning efforts (e.g., watershed assessments, TMDLs)
  - Evaluate BMP effectiveness
  - Prioritize protection, restoration, and acquisition efforts
  - Strategize locations for effective mitigation/WQ protection
  - Evaluate success of restoration (e.g., OR)
  - Improve local planning (e.g., Lenexa, KS) (TMDL Implementation)
    - establishing buffer zones or setbacks
    - creating conservation areas
    - siting development
Wetland Bioassessment and Biocriteria Development

- 7 year collaboration within EPA
- National workgroup - BAWWG (formed in 1997)
  - **Membership:** wetland scientists from federal agencies, states and universities
  - **Objective:** To improve methods and programs to assess the biological integrity of wetlands
- Spring 2000: EPA Wetland Monitoring Strategy WG
19 “State of the Science” reports released in May, 2001
written by BAWWG, NEBAWWG, and Nutrient Criteria Workgroup
How Do Wetlands Fit In?
Assessment and Monitoring Goals

- identify, characterize, or measure wetland qualities (functions, benefits)
- determine stressors to wetlands
- determine changes to wetland condition over time
- provide information useful in protecting and restoring wetlands
Different methods provide different types of valuable information

- **Landscape Level** data to understand watershed condition impacting wetlands (remote sensing, existing GIS layers, landscape profiling)

- **Rapid Assessment** data to scope likely problems and useful parameters (sub-sample of landscape level, hydrogeologic setting, land uses and stressors)

- **Site Specific (quantitative methods)** to understand wetland condition sub-sample of rapid assessment level, bioassessment methods, hydrologic measures
Wetland Monitoring Pilot Projects

HGM = Hydrogeomorphic Approach - evaluates wetland functions & values

Bioassessment

Bioassessment & HGM

Virgin Islands & Puerto Rico

HGM

Bioassessment

Bioassessment & HGM
## Assemblages Used in Wetland Bioassessment Projects

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How Do Wetlands Fit In?

W³ATER: An Example

- Developed by Dr. Robert Brooks at the Penn State Cooperative Wetlands Center

- Uses information from 3 data levels: landscape, rapid assessment, quantitative methods

- Integrates numerous methodologies
How Do Wetlands Fit In?
W³ATER: An Example

• Answers questions on:
  † wetland condition (builds a baseline)
  † changes in condition
  † net gains/losses

Provides information that address issues such as criteria for developing TMDLs, 303(d) listing, 305(b) reporting

• Can assist with 404 permitting decisions and 319 planning
How Do Wetlands Fit In?
National Wetland Assessment and Monitoring Strategy

- Wetland monitoring is a **national priority**
- May 2002: National Wetlands Monitoring WG
- Ongoing and Future Plans:
  - National Monthly Conference Calls
  - Region 7 Wetland Monitoring Work Group
  - Training
How Do Wetlands Fit In?

Wetland Monitoring is a Regional Priority

- Workload
- Funding
- Training
- Technical Assistance
Resources: Information and Support

• **Wetlands Division Web Page:**
  – http://www.epa.gov/owow/wetlands/bawwg/

• **Wetland Monitoring:**
  http://www.epa.gov/owow/wetlands/monitor/

• **“State of the Science” Bio-assessment Modules:**
  – http://www.epa.gov/waterscience/criteria/wetlands/

• **Funding - Wetlands and Watershed Monitoring:**
  – http://www.epa.gov/owow/wetlands/grantguidelines/
How To Obtain Information
Wetlands Helpline

• **Hours:** Monday through Friday, excluding Federal Holidays, 8:30am to 5:30pm Eastern Standard Time.
  – Voice mail available after business hours.
• **Telephone:** (toll free U.S.) **1-800-832-7828.**
  – International callers: (202) 260-6029.
• **FAX:** (202) 260-0386.
• **E-Mail:** wetlands.helpline@epa.gov
• **Helpline Publications List:**
  http://www.epa.gov/owow/wetlands/wetpubs.html
• **Mailing Address:**
  Wetlands Helpline
c/o EPA Water Resource Center
Mail Code RC-4100
1200 Pennsylvania Ave NW
Washington DC 20460
Wetlands Monitoring Is Worth It!

“For if one link in nature’s chain might be lost, another might be lost, until the whole of things will vanish by piecemeal.”

- Thomas Jefferson
The End? Or The Beginning?