

WATERSHED IMPLEMENTATION STRATEGIES

**Emerging Policies and
Programs**

Clean Waters, Clean Lake
April 24, 2007

AGENDA

- Introductions
- Where we have been
- Where we could go
or want to go
- Strategies of how to
get there

MILWAUKEE WQI: PLAN(S) BASED ON THE WATERSHED APPROACH

- Use Nature's Boundaries
- Decisions Based on Water Quality
- Understand Water Quality Stressors
- Focus Actions on Greatest Returns (where to spend the next \$1.00)
- Public Involvement & Collaboration

Point Sources:

- SSOs
- CSOs
- WWTP's
- Industrial discharges

Non-Point Sources:

- Polluted urban & rural stormwater
- Construction & Industrial site runoff
- Transportation sources



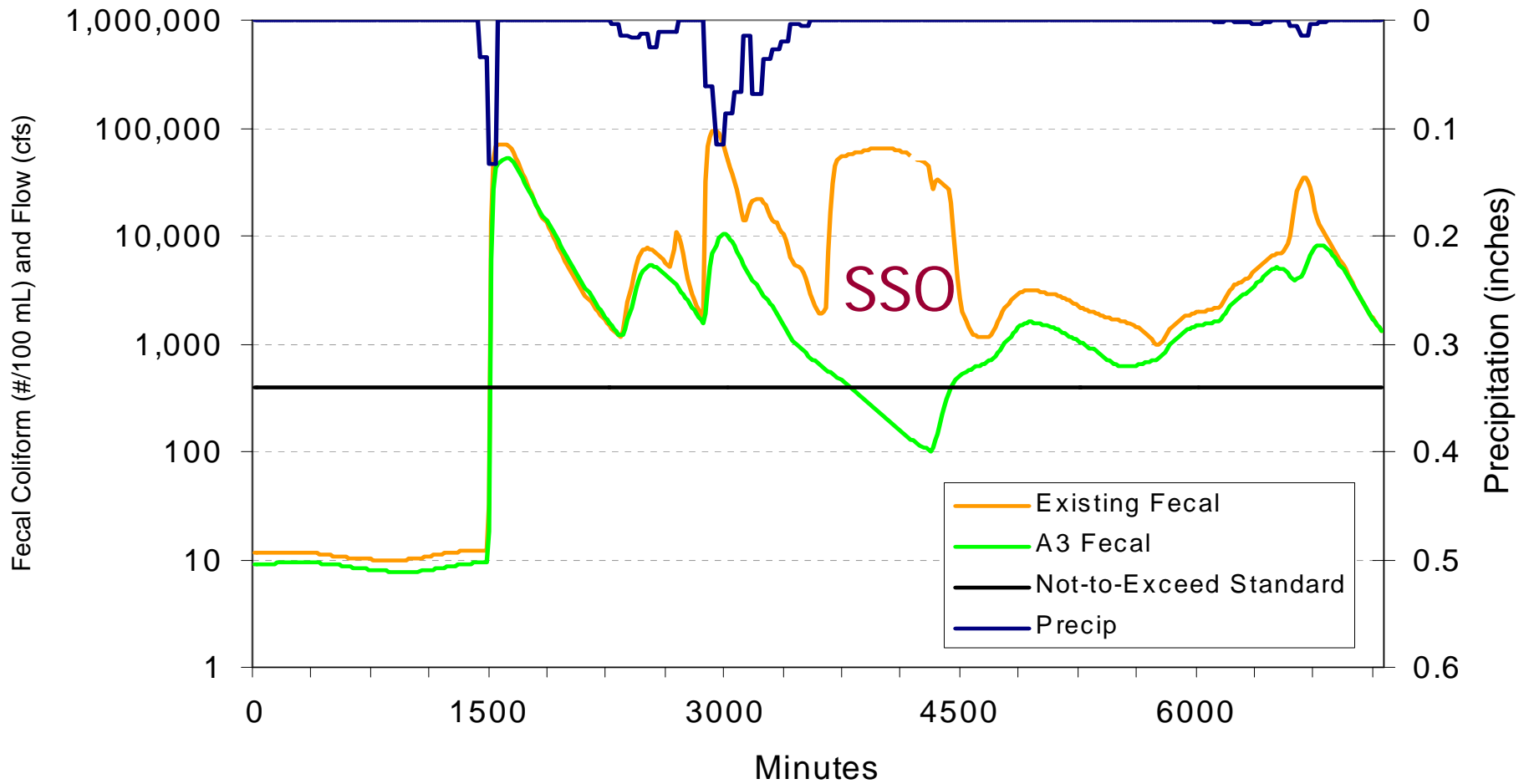
WAY AHEAD OF THE CURVE

- 25 to 30 years worth of data
- Fully developed models for MMSD system, watersheds and lake/estuary
- Detailed technology analysis
- Ground breaking research (UWM WQI)

Knowledge base here is among the best in the US

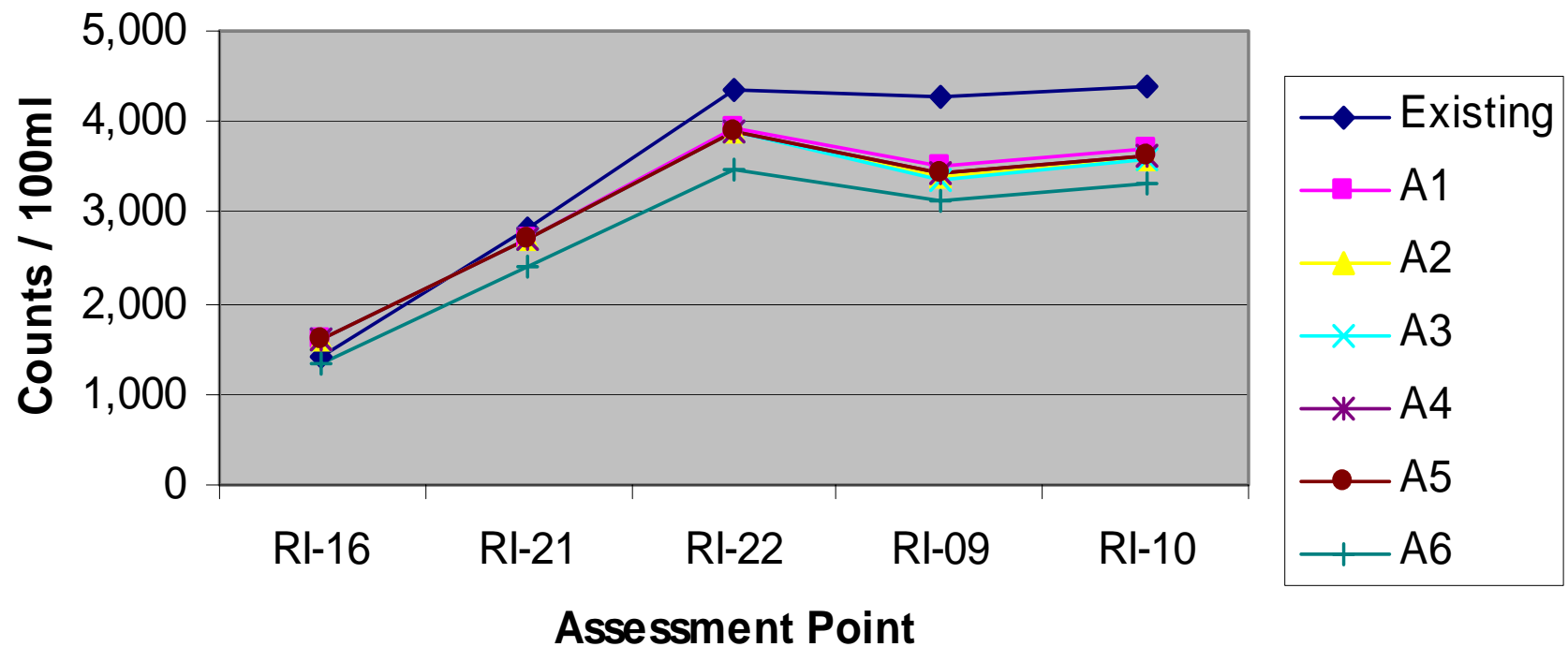
"We have learned a lot - which has shown us where we need to go"

MENOMONEE RIVER WET WEATHER EVENT



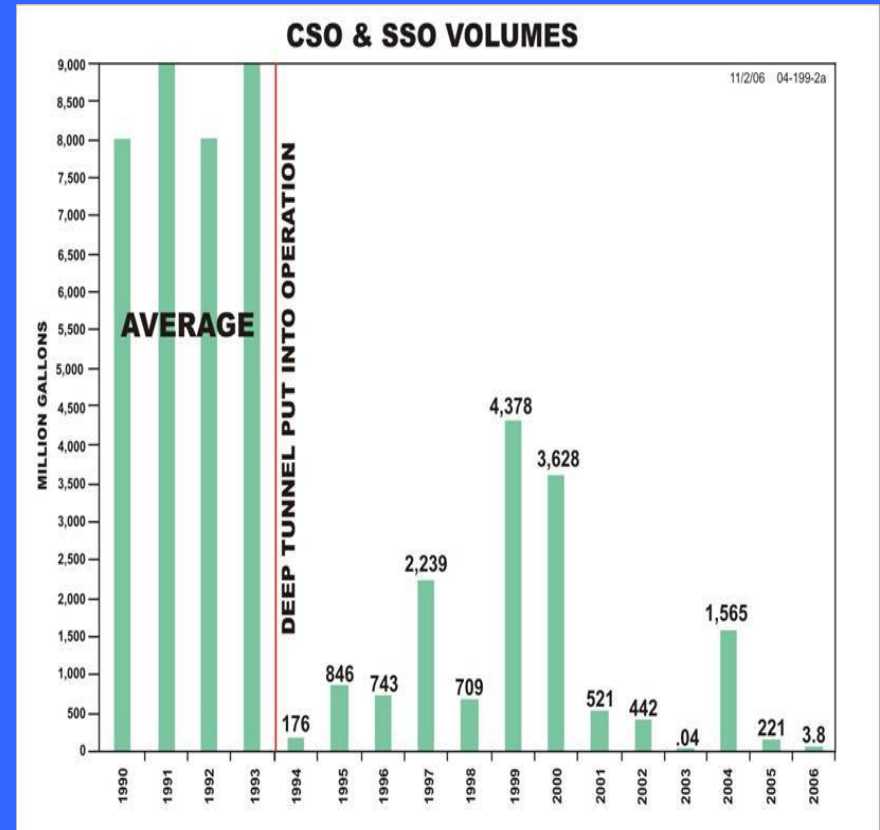
NO SSO = 13 HR WQ in 100 HR EVENT

Fecal Coliform - Mean Concentrations at Assessment Points along the Menomonee River Watershed - Entire Year

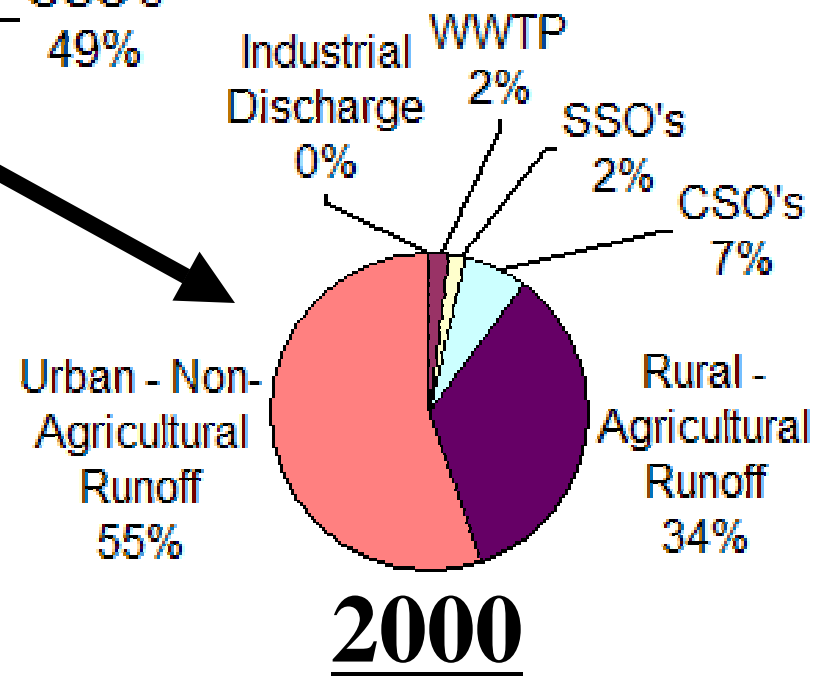
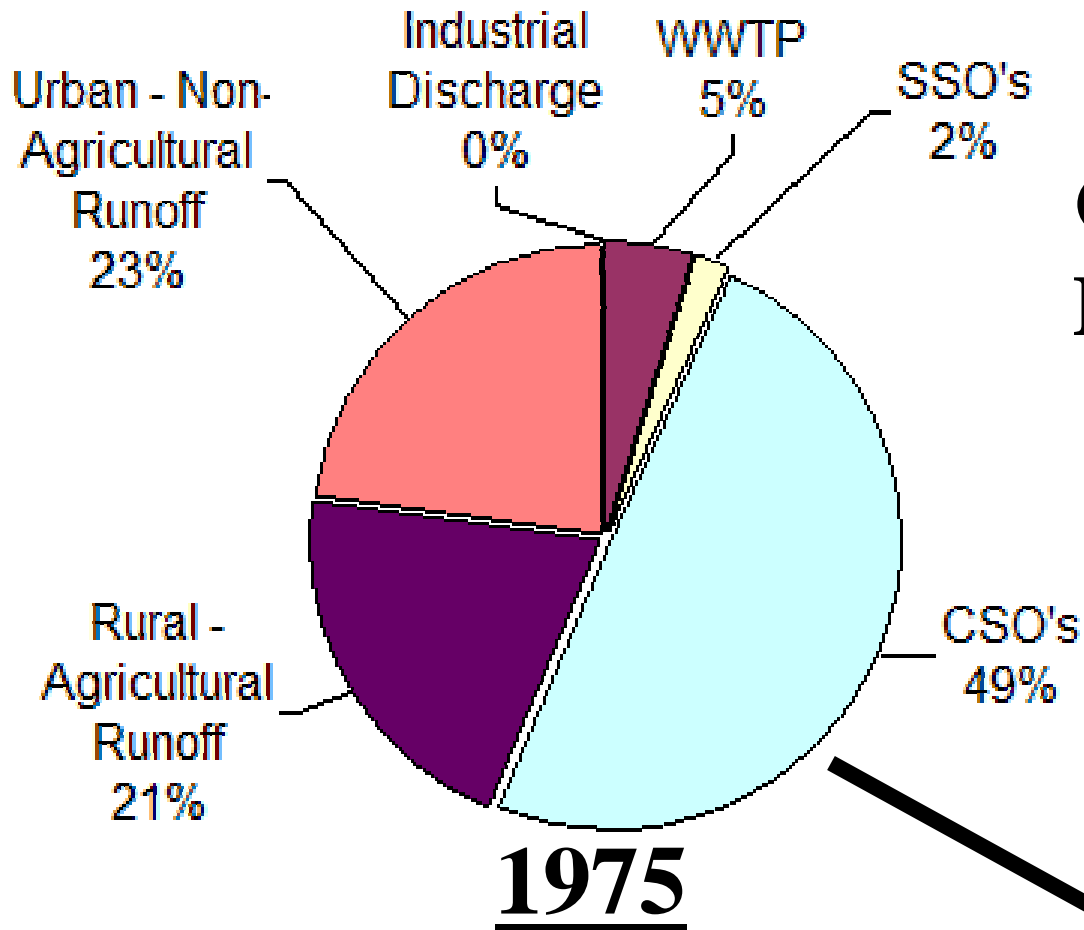


**NONPOINT CONTROLS – LESS \$ AND
MORE WQ IMPROVEMENT**

Water Quality Progress:



Greater Milwaukee Region's Combined Fecal Coliform Loadings

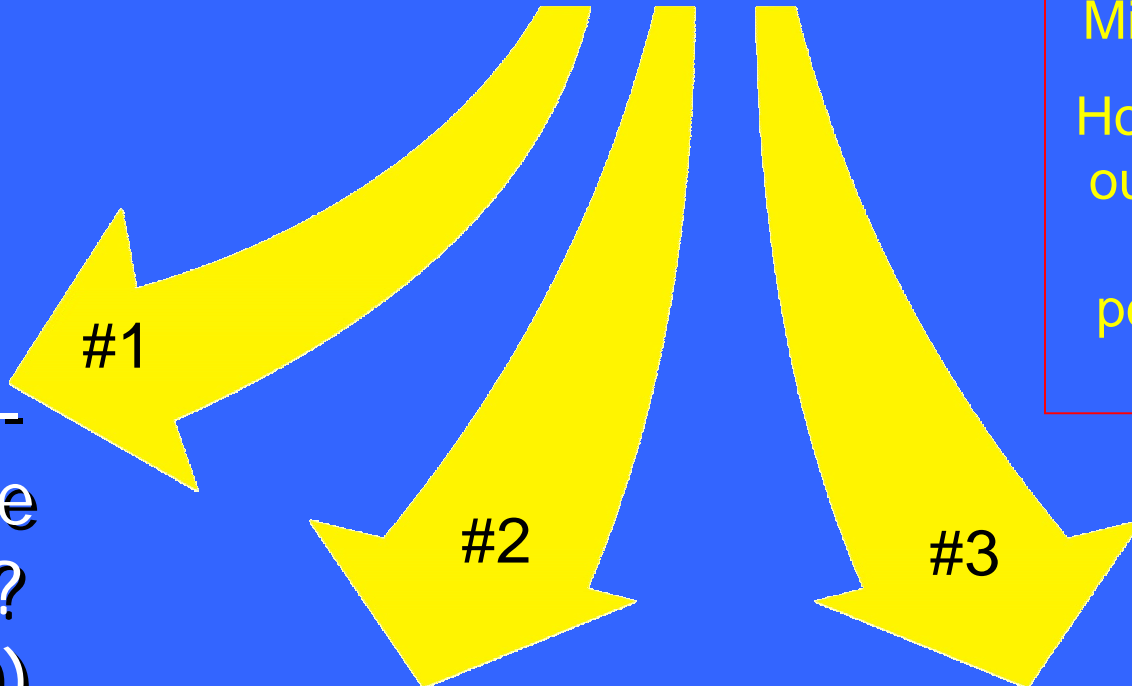


Source: SEWRPC

WHAT NEXT?

What should Milwaukee do now?
How do we leverage our knowledge with regulations and policies to improve water quality?

Stop -
we are
done?
(SILO)



WATERSHED
TMDL/WWWQS
Watershed Permits
UAA/TRADING

ADAPTIVE WATERSHED
Innovative
Watershed
Strategies

Where we have been...
and
21st Century
Approaches to Water Quality
Restoration

Federal Water Pollution Control Act Amendments of 1972 (Clean Water Act)

- Goals: “fishable & swimmable” where attainable
- Wastewater treatment requirements
- Compliance & enforcement
- Water Quality Standards

....35 YEARS LATER

- Are we meeting CWA Goals?
- Are more improvements attainable?
- What are the challenges?

ASSESSED RIVERS AND STREAMS

Supporting Uses (EPA 841-R-02-001)

Good

61%

8%

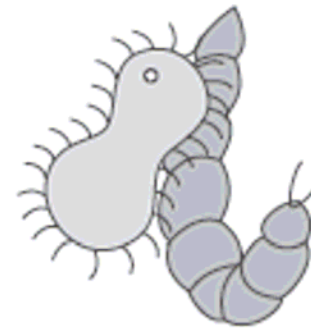
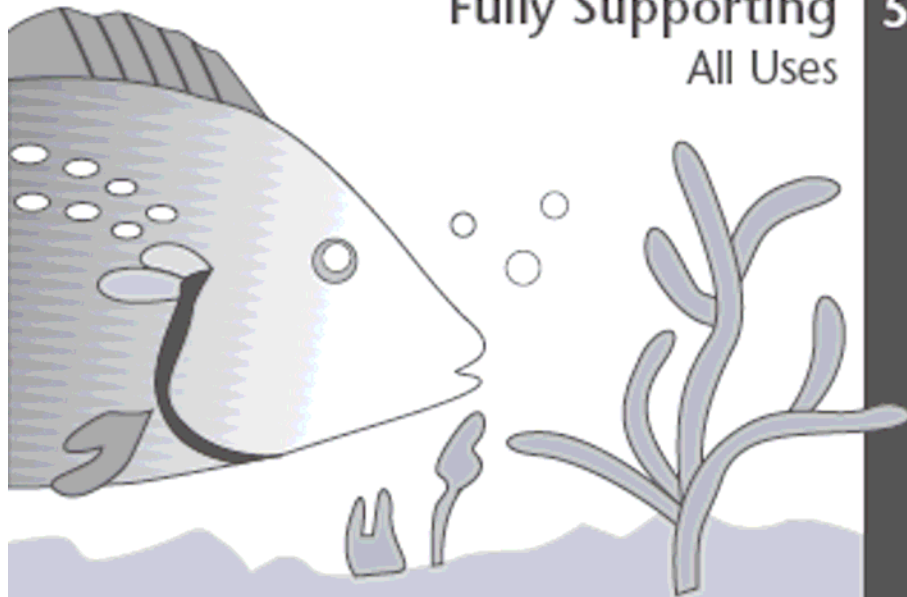
Fully Supporting
All Uses

53%

39%

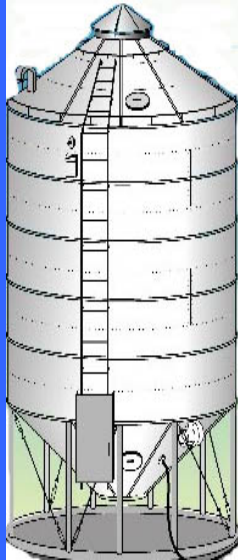
Not
Attainable

<0.05%

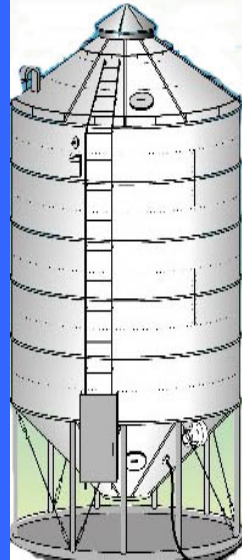


TRADITIONAL APPROACH TO WATER QUALITY PROTECTION

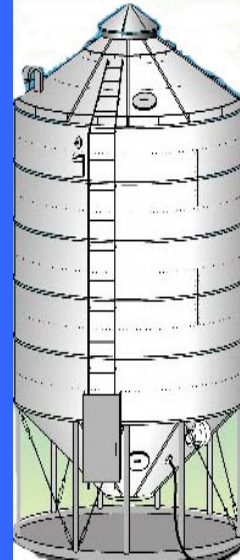
Sewage



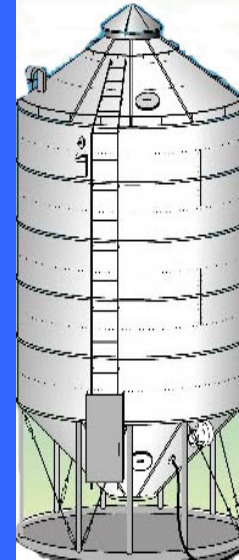
Industrial waste



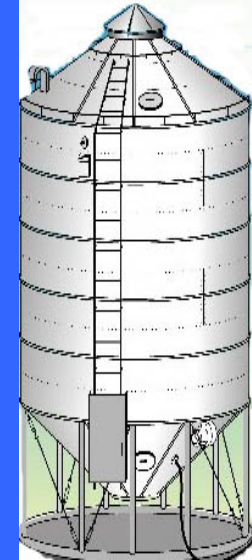
CSO



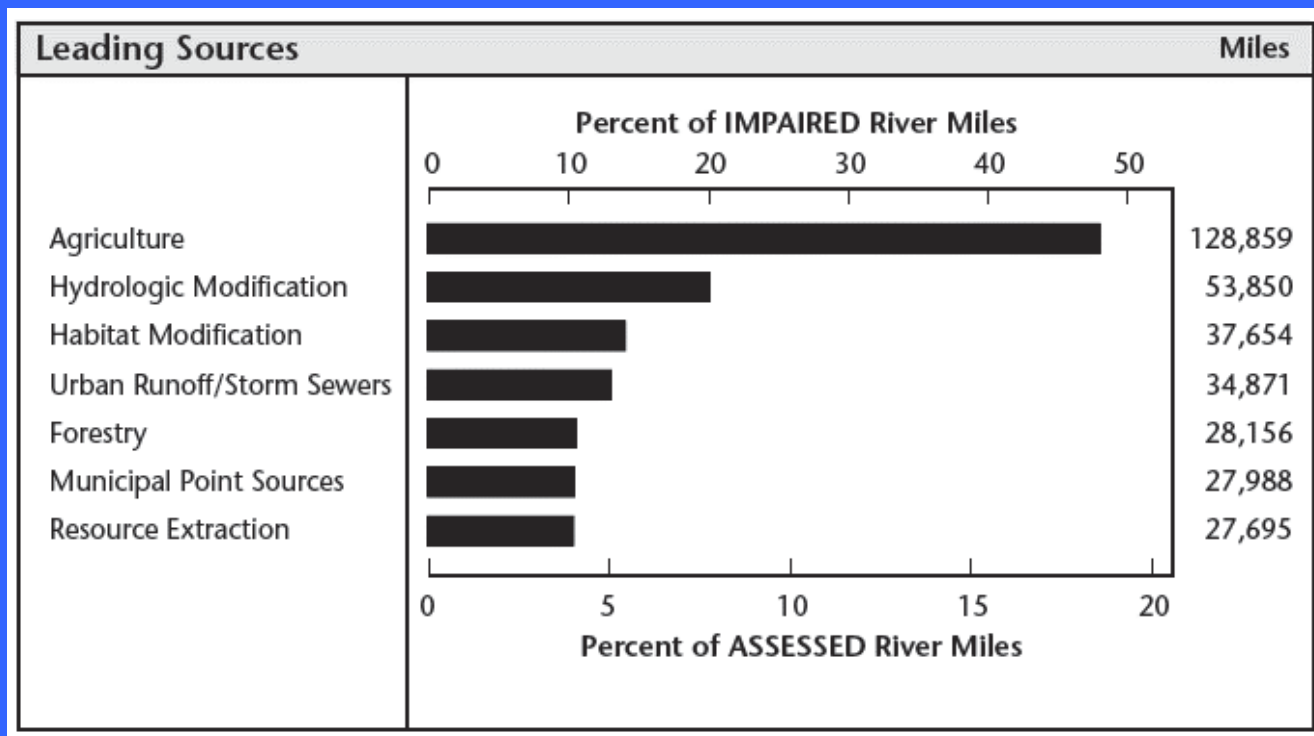
SSO



Storm Water

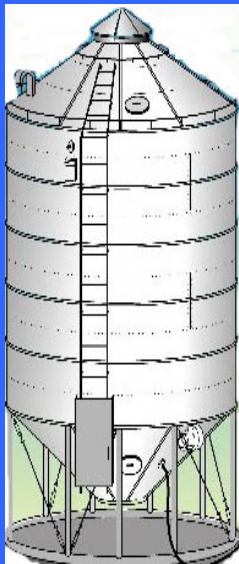


LEADING SOURCES (EPA 841-R-02-001)

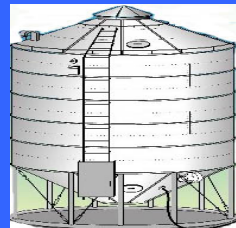


CLEAN WATER WATERSHED REGULATION

NPDES



Agriculture



**Natural
Habitat**

Flow

17TH CENTURY WISDOM

ISAAC NEWTON *(adapted)*

- Objects at rest remain at rest, unless acted upon by an outside force
- Same is true for our traditional approach to water quality protection

IMPLEMENTATION

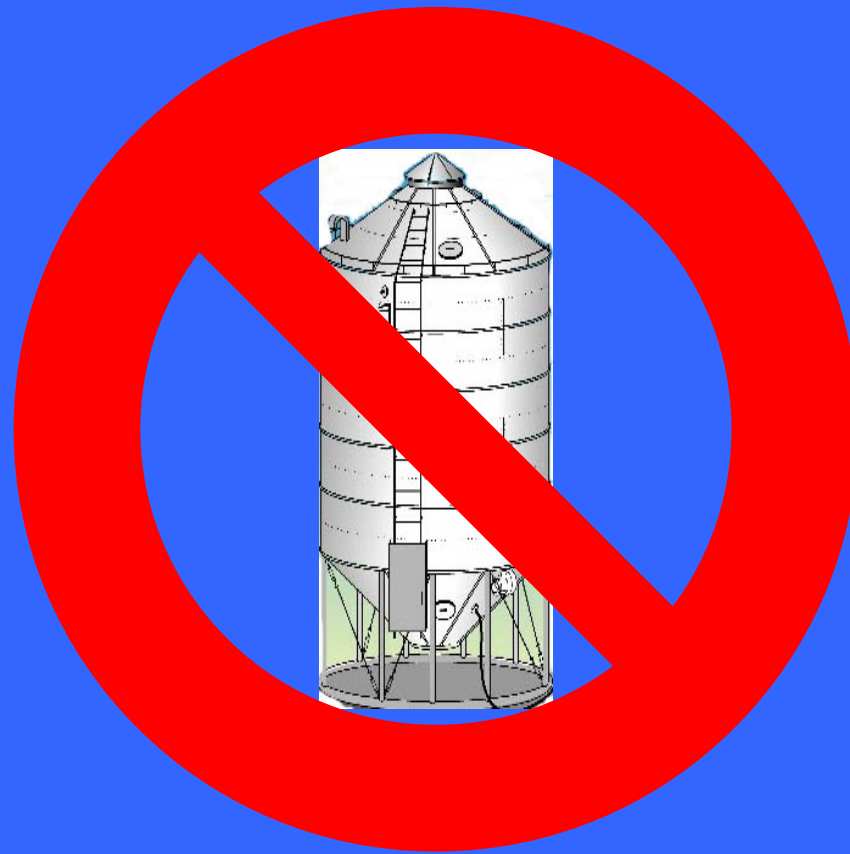
- FOLLOW THE CONVENTIONAL REGULATORY APPROACHES

OR

- ADOPT AN INNOVATIVE WATERSHED BASED APPROACH TO REGULATIONS AND GUIDANCE

Ineffective

Inefficient



21st CENTURY APPROACHES TO WATER QUALITY PROTECTION

- Watershed Management
- Adaptive Management

WATERSHED MANAGEMENT PLANS

(modified, EPA 2005)



ATTRIBUTES OF WATERSHED MANAGEMENT

- Stakeholder input
- Examine all loads & stressors
- Holistic assessment problems & solutions
- Focus on priorities, not programs
- Integrates well with TMDLs (more from Leslie)

CHALLENGES FOR WATERSHED MANAGEMENT

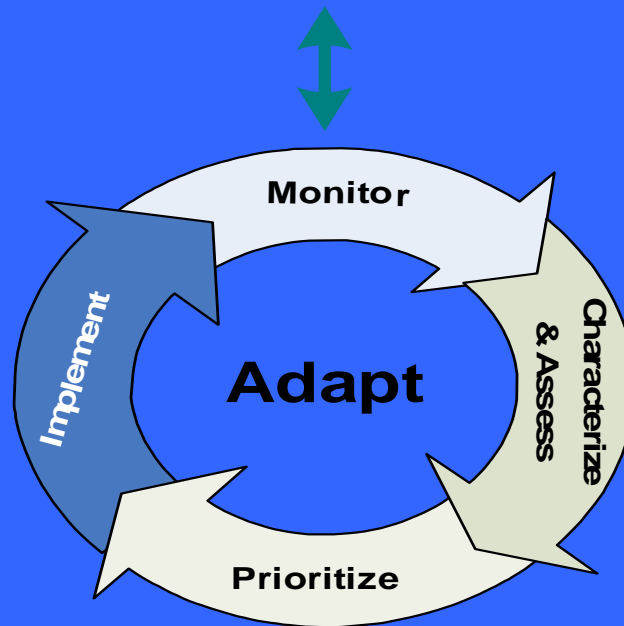
- Lack of comprehensive authority
- Lack of sufficient data
- Future uncertainty

ADAPTIVE WATERSHED MANAGEMENT

Regulators

Public

GOALS

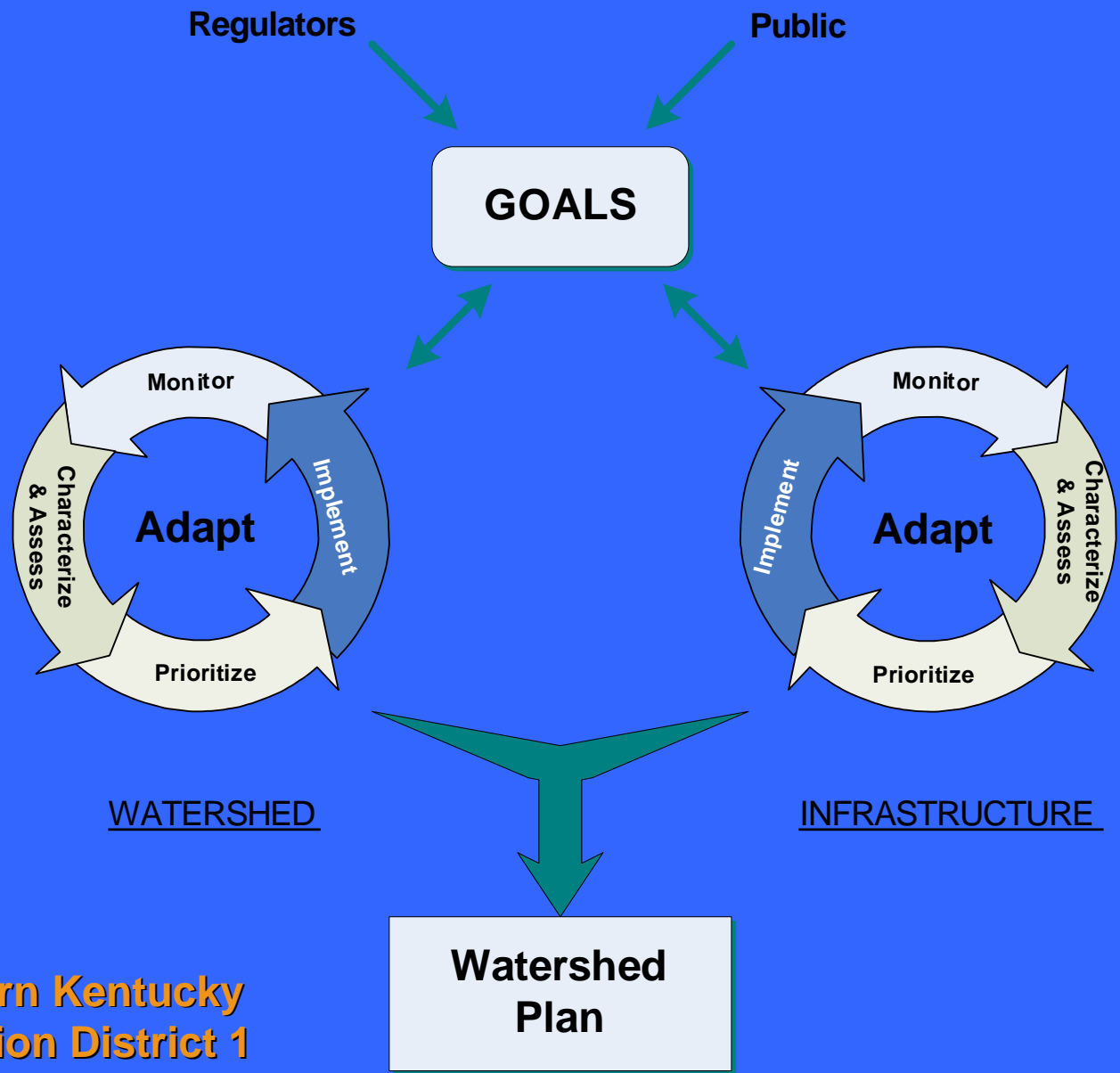


ADAPTIVE WATERSHED MANAGEMENT

- Strength of Watershed Management (holistic, prioritize. . .)
- Progress in face of uncertainty
- “Learn” while “doing”
- Persistence not impatience or avoidance
- Cost effective

EXAMPLES OF ADAPTIVE MANAGEMENT

- Resource management
- Clean Water Act
- TMDL program evolution
- Complex multi-stressor systems
 - Northern Kentucky Sanitary District 1



**Northern Kentucky
Sanitation District 1
Adaptive Watershed
Management & CSO
Control (DRAFT)**

ADAPTIVE GOALS? LEGISLATIVE & REGULATORY SUPPORT

- Triennial Reviews WQ Standards
- Use Attainability Analysis
- National CSO Policy
- Wet Weather Water Quality Act
- EPA Watershed Permitting Guidelines

USE ATTAINABILITY ANALYSIS "UAA"

What it is:

- Regulatory process for reviewing/revising designated uses in water quality standards
- Process to align designated uses with realistic expectations

What it isn't

- Application to increase pollution loads
- Process to downgrade existing uses

USE ATTAINABILITY ANALYSIS

Allowed justifications for change

- *Natural pollution*
- *Human alterations*
- *Dams, diversions...*
- *Low/no flow*
- *Physical features*
- *Socio-economic impacts*

May not change an existing use!

Can not avoid treatment required by law

UAA EXAMPLES AND CHALLENGES

Examples:

- Simple: Oklahoma 1-day UAAs
- Obvious: Cuyahoga River Shipping Channel
- Complex: Chesapeake Bay

Biggest challenge today:

- Wet weather conditions

WATER QUALITY STANDARDS WET WEATHER ISSUES

- Physical hazards
- High flow hazards
- High vs. low flow
- Non CSO/SSO
pollution
- Assessing Risk
- Storm recurrence
- Irreversible changes
- Cost effectiveness
- Affordability
- Criteria

WET WEATHER WATER QUALITY STANDARDS (WWWQS)

- Do existing water quality standards make sense in light of 21st century understanding of public health protection?
- Should standards be the same 365 days per year?
- Should changes like “A higher limit for the highest flow regimes (for instance the top five or ten percent of flows)” be considered?

EXAMPLES OF TWO POINTS OF VIEW

WEF

Existing state water quality standards typically are inadequate for addressing wet weather conditions. New standards are needed under the authority of the Clean Water Act which recognize the intermittent nature of CSO (&SSO) events and the impacts that conditions in tributary areas have on wet weather stream conditions

Natural Resources Defense Council:

“EPA's Proposed Policy on Sewage Dumping During Wet Weather Conditions”

The plan will worsen water quality, expose the public to waterborne pathogens and toxic chemicals, and adversely affect the economy.

ORSANCO: STATES AND EPA WORKGROUP CONSIDERATIONS

- A reasonable target must be established for control of wet weather pollution sources; this target must be as fixed as possible and not subject to periodic change.
- Pathogen criteria established to protect water supply use should be met at all times.
- Pathogen criteria established to protect recreation should be met at all times when the river is otherwise safe for contact recreational use.
- All sources of pathogens should be required to provide a reasonable level of control. For Combined Sewer Overflows, this includes the Nine Minimum Controls and a Long Term Control Plan.

ORSANCO: STATES AND EPA WORKGROUP CONSIDERATIONS

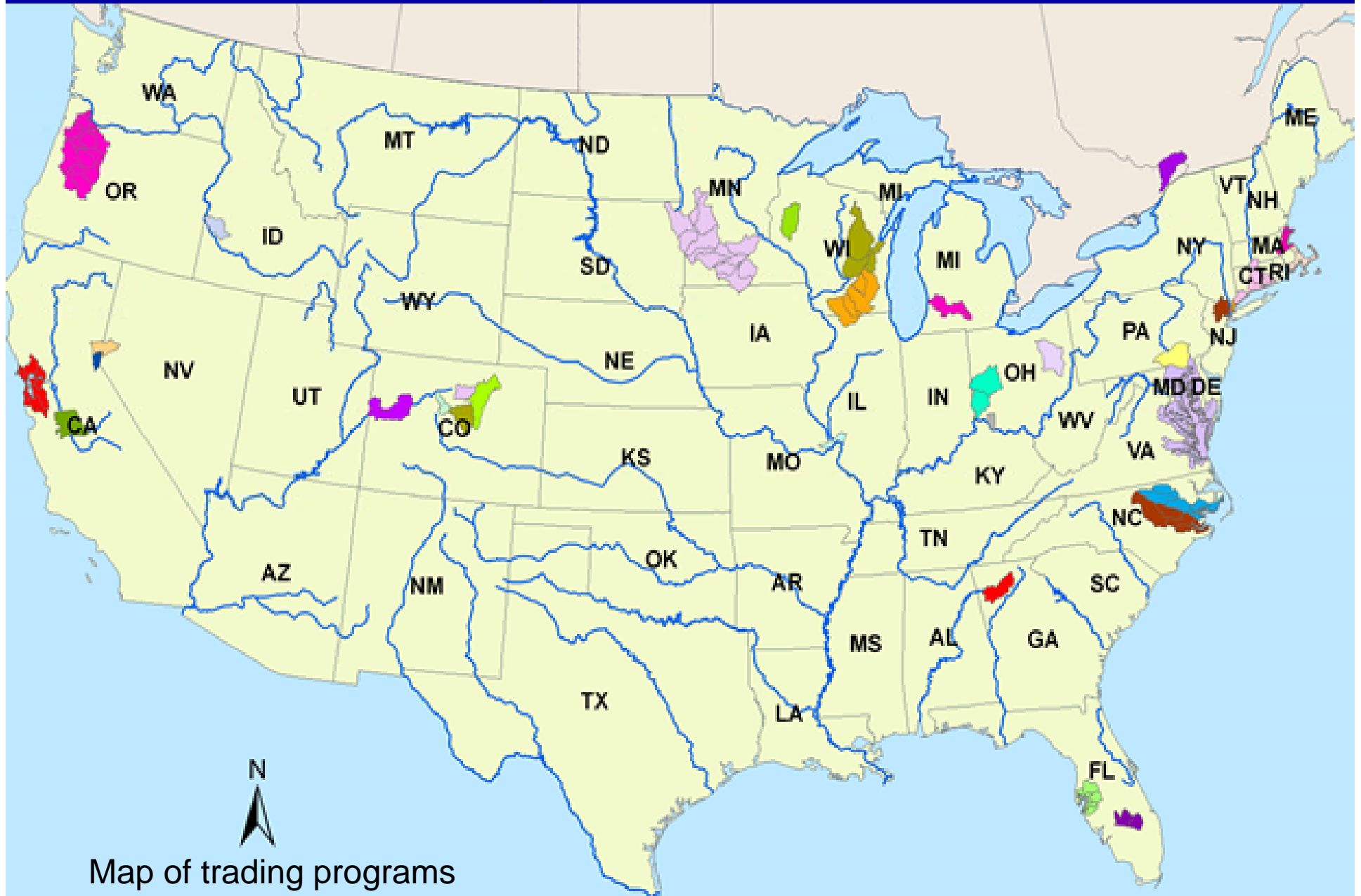
- The public needs to receive clear information regarding the risks of contact recreation in the Ohio River.
- Decisions that involve the balancing of risk to the public in recreational use of the river versus cost to the public in order to control pathogens need to be made with considerable public involvement.
- The approach taken to develop wet weather standards for the Ohio River should be appropriate for use on other waterbodies in the Ohio River watershed and across the U.S. that are affected by urban wet weather sources of pollution.

VALUE ENGINEERING (WATER QUALITY TRADING WQT)

- Watershed Approach
- **Market-based tool**
 - A **High Cost** treatment loader pays a **Low Cost** treatment loader to reduce beyond their requirement. (Win-Win)
- **Credits are Real, Quantifiable, and Surplus**
- **Resource Net Benefit**
- **Standardized Methods**



WATER QUALITY TRADING



Map of trading programs

ANCILLARY BENEFITS

- Accelerated implementation
- Upstream improvements
- Other pollutants reduced: Sediment, Sediment Born parameters and Temp
- Habitat restoration (Water and Land)
- Hydrology improvements
- Increased assimilative capacity

TOTAL MAXIMUM DAILY LOADS "TMDL"

Leslie - add 2-3 slides on topic

"TMDL" - SUCCESS STORIES

- placeholder

"TMDL" - LIMITATIONS

placeholder

Watershed permitting

LESLIE - 2 to 3 slides and discussion

Watershed permitting

placeholder

Watershed permitting

placeholder

IMPLICATIONS FOR MILWAUKEE WQI

HOW TO LEVERAGE MILWAUKEE WQI AND EMERGING POLICIES

**WATERSHED ACTIONS - WHAT
SHOULD BE DONE OR COULD BE
DONE GIVEN WHAT WE KNOW AND
EPA GUIDANCE?**

RISK BASED WATER QUALITY CRITERIA

- REASONS TO CONSIDER THIS
- COMPARE TO WWWQS
- ISSUES WITH FECAL COLIFORM, E COLI

SCIENCE ISSUE WITH PATHOGENS - SPECIAL CONSIDERATION

- REASONS TO CONTINUE STATE OF THE ART RESEARCH IN MILWAUKEE

WATERSHED PERMITTING

COLLABORATIVE COOPERATIVE IMPLEMENTATION

POSSIBLE NEXT STEPS

REGULATORY CONCERNS

HOW TO MAKE A DECISION IN THE FACE OF UNCERTAINTY

“The mark of an educated mind is to rest satisfied with the degree of precision which the nature of the problem permits and not seek an exactness where only an approximation is possible.”

Aristotle
(circa 350 BCE)