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Sustainable Infrastructure Solutions Now and in the Future

Doug Smith

16 July 2009



Water – Our Most Precious Resource



Clean Water Act – Regulatory Driver of Change

Federal Water Pollution
Control Act

1948

Water Quality Act

1965

Clean Water Act

1977

Federal CSO Policy

1994

ARRA Funding for Clean
Water Act Projects

2009

1956

Water Pollution
Control Act

1972

Federal Water Pollution
Control Act Amendments
of 1972 passed

1987

Water Quality Act

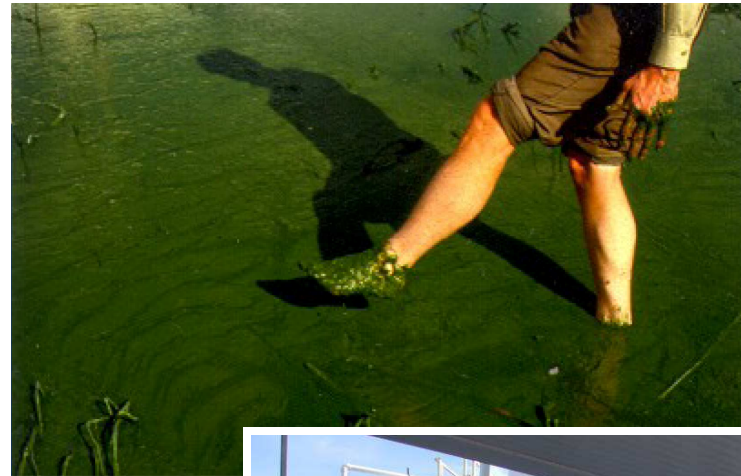
2000

Wet Weather Water
Quality Act



21st Century Challenges

- ▶ Nutrient Removal
- ▶ TMDL Implementation
- ▶ Micro-constituents
- ▶ Reducing CSOs/SSOs
- ▶ Climate Change
- ▶ Water Reuse
- ▶ Resource Optimization (energy and chemicals)



Milwaukee Metropolitan Sewerage District

- ▶ Nearly \$4B invested since 1980 in reducing sewer overflows using predominantly “end-of-pipe” solutions
- ▶ 2003 embarked on 2020 Facilities Plan and Regional Water Quality Management Plan Update efforts
- ▶ Collaborative watershed approach to improving water quality, especially non-point sources



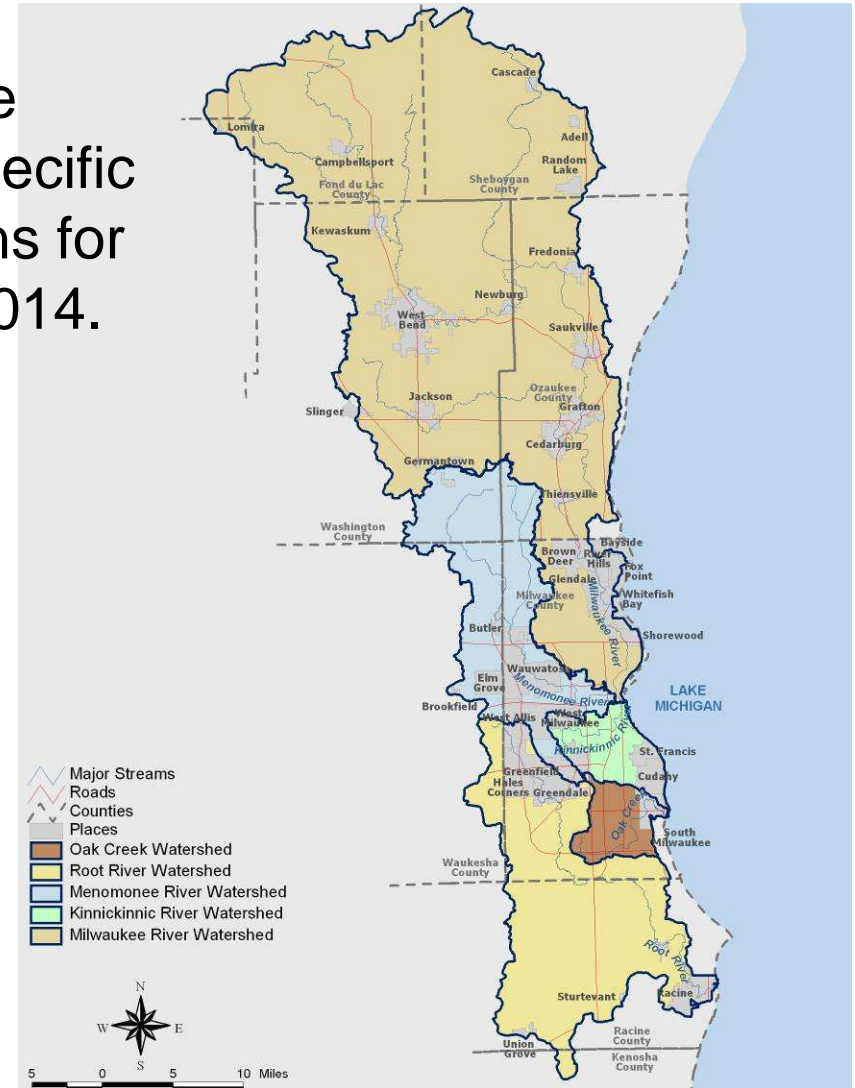
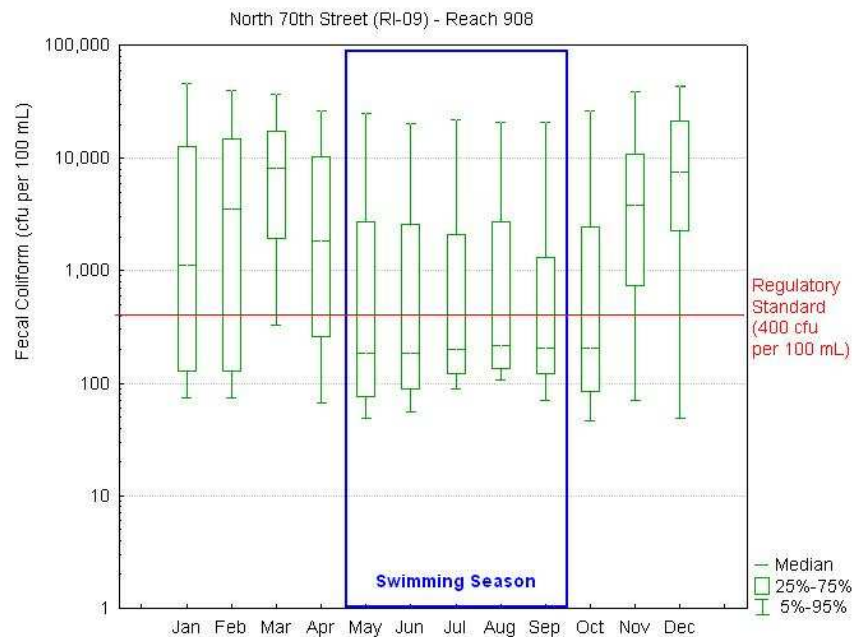
Milwaukee Metropolitan Sewerage District

- ▶ 2020 Facilities Plan includes mix of “engineered” and holistic approaches:
 - ▶ Maximizing use of existing facilities
 - ▶ Greenseams Initiative
 - ▶ Green solutions – rain gardens, rain barrels, green roofs, etc.
- ▶ Regional collaboration is key to success of programs
 - ▶ Working regionally to develop watersheds and select pilot project



Milwaukee Metropolitan Sewerage District

- Watershed Restoration Plans are under development to identify specific water quality improvement actions for implementation between 2009-2014.



Louisville Metropolitan Sewer District

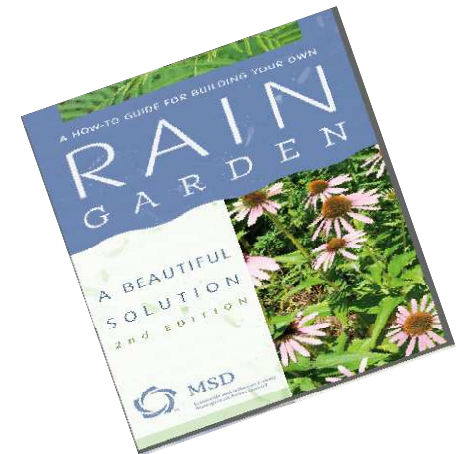


- ▶ Since 1989, \$1.4B invested in infrastructure rehabilitation, private-property programs, CSO treatment, regionalization and “end-of-pipe” solutions.
- ▶ In 2002 initiated “Holistic Watershed Approach” addressing both point and non-point sources impacting water quality
- ▶ Collaboration among the City (MSD), EPA, State regulators and the consulting community to use the *EPA Watershed Approach*



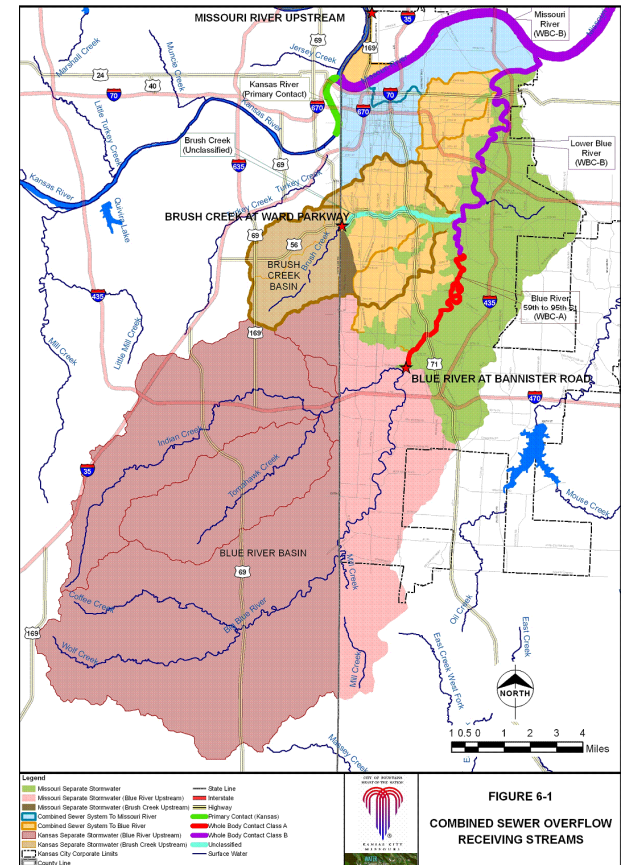
Louisville Metropolitan Sewer District

- ▶ Resource Management Process (RMP) to prioritize investments taking into account regulatory requirements, environmental benefits, habitat, biodiversity and community livability
- ▶ Beargrass Creek pilot project (TMDL) ongoing since 1995 used as a model for other watersheds
- ▶ 2009 Integrated Overflow Abatement Plan submitted to EPA sets framework for \$850M of additional improvements embracing green solutions and adaptive management



Kansas City Water Services Department

- ▶ CSO/SSO and Stormwater Program Planning Completed
- ▶ Preparing to implement:
 - ▶ \$2.4B Overflow Control Plan (OCP)
 - ▶ ~\$1.8B Comprehensive Stormwater Management Program (KC-ONE)
- ▶ Water quality challenges extend beyond the City boundaries



Kansas City Water Services Department

- ▶ Embracing “Green Solutions” and Watershed Management
 - ▶ U.S EPA’s Demonstration of Advanced Drainage Concepts Using Green Solutions for CSO Control (Middle Blue River Basin Pilot Project)
- ▶ Adaptive Management approach planned from the beginning



Program Similarities

- ▶ Initial significant investments in “end-of-pipe” solutions
- ▶ “Holistic Watershed Approach”
- ▶ Green Solutions
- ▶ Adaptive Management
- ▶ Pilot Projects



Sustainability Now & In the Future

- ▶ Continue to implement end-of-pipe solutions
- ▶ Identify non-point sources
- ▶ Widespread implementation of “green” solutions
- ▶ Embrace holistic watershed approach
- ▶ Work across internal organizational & jurisdictional boundaries





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