

# Water Programs Science Needs

Michael Shapiro  
Deputy Assistant Administrator, Office of  
Water  
SAB, 11/09/09

The background of the slide is a solid blue color. In the lower right quadrant, there are several faint, concentric circular ripples, resembling water droplets or raindrops, which are a lighter shade of blue than the background.

# Water Issues are High Priority for EPA

- Administrator's Priority Issue
  - Protecting America's water
- SPC Science Priorities
  - Theme 3: Modernization of (water) Infrastructure



# OW Needs Are Broad and Complex

- Multiple legislative mandates set limits of authority and responsibility for clean and safe water
  - CWA
  - SDWA
  - Food Quality Protection Act (FQPA)
  - Beaches Environmental & Coastal Health Act (BEACH Act)
  - Coastal Zone Management Act
  - Endangered Species Act

# Broad and Complex Needs

- Consider human and ecological health
- Multiple uses of ambient water
  - Navigable, pristine, drinking water source water, fishable / swim-able
- Multiple media – water, fish, sediments, sludge
- Multiple routes – ingestion, inhalation, dermal
- Security of water treatment and delivery

# 1. Contaminants

- “Classic” – regulated and those under consideration
  - All NPDWR are reviewed every six years
  - Changing conditions in water affects the spectrum of contaminants and exposure scenarios
- “Emerging” contaminants
  - Includes chemical and microbial agents
  - Example: PPCPs and PFOS / PFOA have become public concerns

## 2. Human Health Data

- Generation of effects data can't be required under SDWA. OW relies on ORD and outside parties for
  - Screening, bioassays, mode of action data, data for dose response assessment
- Water programs relies on appropriate indicators of presence of microbial pathogens
  - Rapid detection particularly prized
  - Links with data on human disease are needed.

# 3. Water Quantity and Quality

- Water re-use is— especially in arid west.
- Impacts of changing surface water quantity on water quality.
  - (e.g. what is impact of changing flow on habitats and aquatic ecosystems)
- Nutrient criteria development a top priority
  - Movement to numeric criteria and standards
- Gulf of Mexico hypoxia
- Ecosystems services
  - Defining, quantifying and monetizing

# 4. Infrastructure Modernization

- Water treatment plants aging, breaking down
  - One need is information to support movement to Green Infrastructure
- Information on biofilm impact needed; e.g. on outbreak incidence
- Performance effectiveness of existing and innovative treatments
  - Control of emerging contaminants (PPCPs, nanomaterials, prions).
  - Problems will be exacerbated as changing climate affects number, severity and location of severe weather events.
  - Information on effects of storm sewer overflow, blending of effluents will become more critical.

# 5. Climate Change

- Affects all aspects of water programs
- OW produced a Water Program Climate Change Strategy
  - Mitigation – ameliorating change
  - Adaptation – dealing with extant change

<http://www.epa.gov/ow/climatechange/strategy.html>

# 6. Decision Tools

- Information and tools to support proactive policy and management decisions
  - Simulation tools, predictive models, remote sensing technologies, ambient monitoring methods, classification methods, mapping techniques, rapid assessment field methods.
- Support for choices in many areas including
  - carbon sequestration,
  - selection of remediation sites,
  - water quality/wetland/nutrient trading,
  - placement of BMPs within a watershed,
  - land use/protection,
  - built infrastructure sustainability.
- Understanding impacts of alternative uses on quality and quantity and ecosystem and human uses

# National Water Program Research Strategy

- In draft
- Aimed at all parties that have interest in water related research

# Strategy Structure

- Four Organizing Themes
  - Healthy Watersheds and Coastal Waters
  - Safe Drinking Water
  - Sustainable Water Infrastructure
  - Water Security
- For each theme, 5 areas of investigation
  - Aquatic Life Health Effects (not applicable to drinking water)
  - Human Health Effects
  - Occurrence and Exposure
  - Method Development
  - Treatment Effectiveness

# Strategy Structure 2

## ➤ Tiers or timeframes

- Tier 1. Research on the critical path to satisfy a statutory, regulatory, court ordered, or Agency/Office strategic obligation.
- Tier 2. Research that supports or improves existing tools, guidance and policy (or enhance a critical path)
- Tier 3 Future oriented (potential environmental concerns) or opportunistic (takes advantage of serendipitous opportunity to leverage resources).