Panel Session A6

Meeting the Nation’s Needs for Water-Quality Information in the Next Decade:
Planned Contributions from the NAWQA Program

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Gary Rowe
U.S. Geological Survey, NAWQA Program
Denver, Colorado
What is the current quality of the Nation’s surface water and groundwater?” (Status)

Is water quality getting better or worse?” (Trends)

What are the natural and human factors that control water quality?” (Understanding)
Important Features of NAWQA

• Operates perennially on a decadal time-scale
  Cycle 1 (1991-2001)
  Cycle 2 (2002-2012)
  Cycle 3 (2013-2023)
• Consistent sampling and analytical methods
• Targeted design (based on land and water use)
• Multidisciplinary—hydrology, chemistry, ecology
• Multiple scales—local, regional, national
Transition from Cycle 1 to Cycle 2

Study units to...
  Regional assessments

Status to...
  Trends and Understanding

Monitoring to...
  Monitoring and Modeling

NAWQA Data...
  NAWQA & Other Agency Data
Use of steady-state water-quality models like SPARROW to estimate nutrient delivery to Gulf of Mexico

Watershed ranking of nitrogen delivery

Nitrogen
Priorities for Cycle 3

- Nutrients
- Contaminants
- Sediment
- Streamflow Alteration
Cycle 3 Design Framework

Large-Scale Drivers
- Climate Variability
  - "Natural Factors"
- Land and Water Use
  - "Human Activities"

Water-Quality Stressors
- Contaminants
- Nutrient enrichment
- Sediment
- Streamflow alteration

Receptors
- Humans
- Aquatic Ecosystems
Cycle 3 Science Plan Goals

- **Goal 1**: Assess the current quality of the Nation’s freshwater resources and how water quality is changing over time (*status and trends*)
- **Goal 2**: Evaluate how human activities and natural factors, such as land use and climate change, are affecting the quality of surface water and groundwater (*understanding causes*)
- **Goal 3**: Determine the effects of contaminants, excessive nutrients, sediment, and streamflow alteration on aquatic ecosystems (*assessing effects*)
- **Goal 4**: Predict the effects of human activities, climate change, and management strategies on water quality and ecosystem condition (*forecasting*)
Expected Contributions

- Restoration of monitoring networks
- Reliable and timely trend analyses
- Models and decision-support tools
- Understanding relations between critical stressors and stream ecosystem condition
- Forecasts of future conditions
Two Budget Scenarios

• “Science Plan” Scenario
  – Developed to meet national needs identified by NAWQA stakeholders and NRC Committee
  – Full implementation cost would be about 4 times current (FY12) funding level (~$63M)

• “Current Funding” Scenario
  – Starts at current funding level in 2013
  – Assumes flat budget over 10 years with 4% annual inflation rate
  – ~30% loss in spending power by 2023
Two Stream and River Water Quality Networks

“Science Plan”

“Current Funding”
Integration and Partnering are Critical

“National Assessment”

State and Local Agencies

Water Census (WaterSMART)

USDA (ARS, NRCS)

National Monitoring Network

NAWQA

EPA (NARS, ORD, OST, OGWDW)

Groundwater Resources Program

NOAA and other Federal Agencies
What You’ll Hear about Today:
Approaches and Contributions

- **Surface Water Status & Trends Assessment** (Bob Gilliom)
  - NARS Wadeable Streams Survey (Ellen Tarquinio)
  - Temperate Plains Synoptic Study (Pete VanMetre)
- **Stressor Effects on Stream Ecosystems** (Mark Munn)
- **Groundwater Monitoring and Modeling** (Ken Belitz)
- **Integrated Watershed Studies** (Paul Capel)
- **Forecasting Studies** (Dave Wolock)