NAWQA Liaison Committee Update

Briefing for Advisory Committee on Water Information

July 13, 2011

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Purpose of today's briefing:

- ✓ Update ACWI on NAWQA Liaison activities
- ✓ Provide short refresher on the plans for the Program's third decade (Cycle 3)
- ✓ Highlight assessment activities, products, and outcomes that are coming out soon
- ✓ Answer any questions on the Science Plan and discuss next steps

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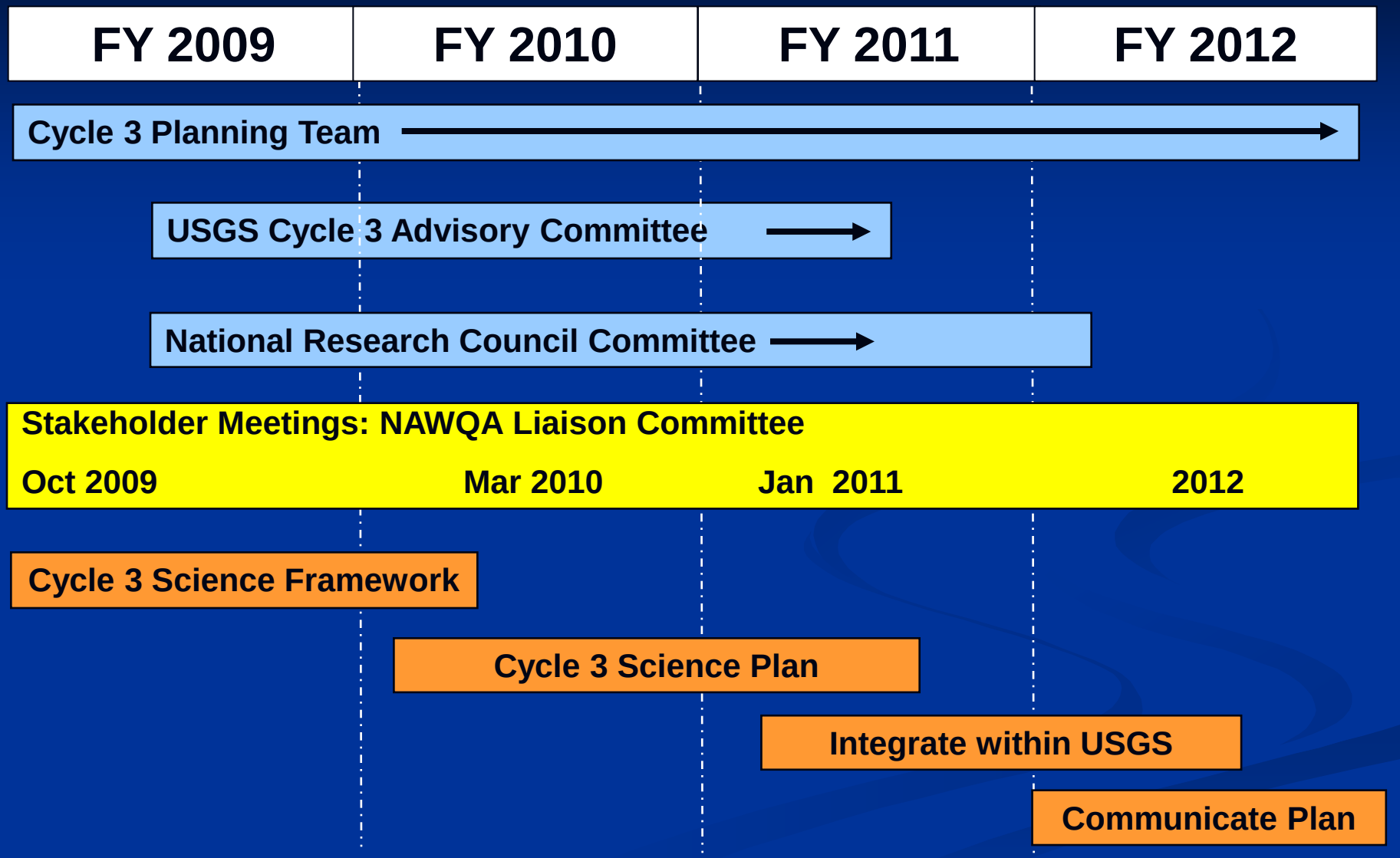
Overview of Planning Effort and Cycle 3 Science Plan

Planning Timeline



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Cycle 3 Vision

Science-based strategies can protect and improve water quality for people and ecosystems even as population and threats to water quality continue to grow, demand for water increases, and climate changes

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Critical Issues

Excess nutrients

Contaminants

Sediment

Streamflow Alteration

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Elements of NAWQA

- **Decadal-scale national program—**
  - **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)**
- **Multiple scales**
- **Multidisciplinary—hydrology, chemistry, ecology**
- **Multi-level communication strategy**

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Transition from Cycle 1 to Cycle 2

Study units to….

Regional assessments

Status to….

Trends and Understanding

Monitoring to….

Monitoring and Modeling

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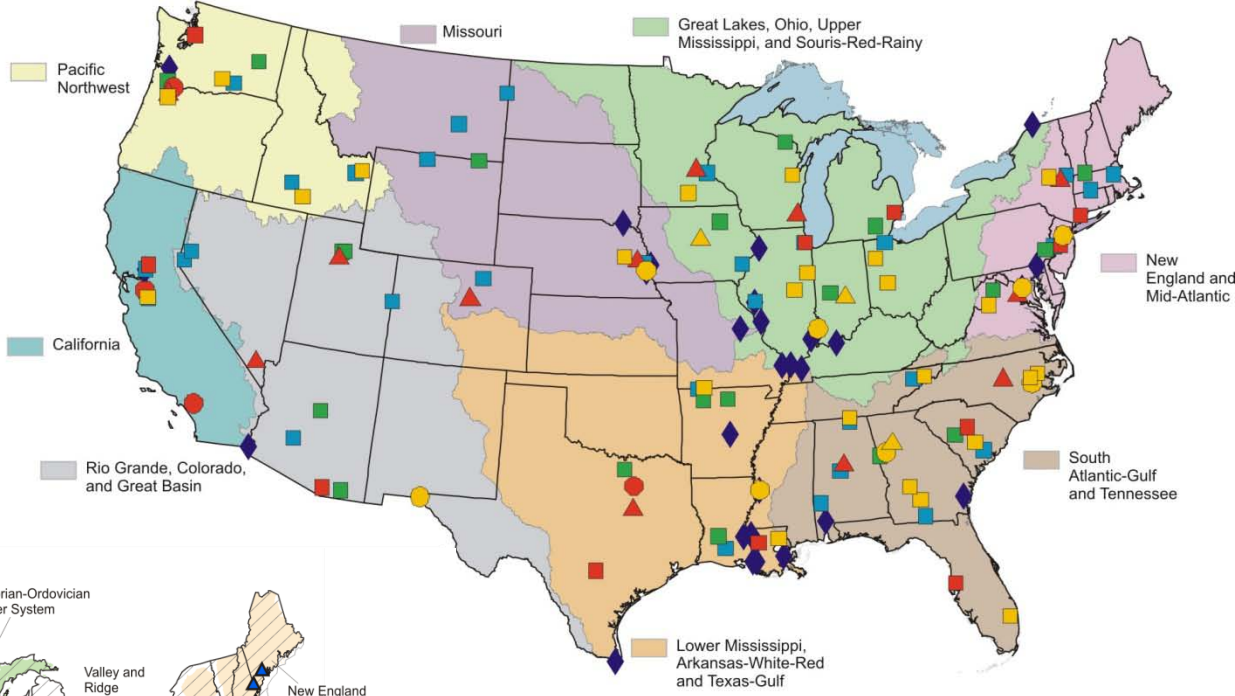
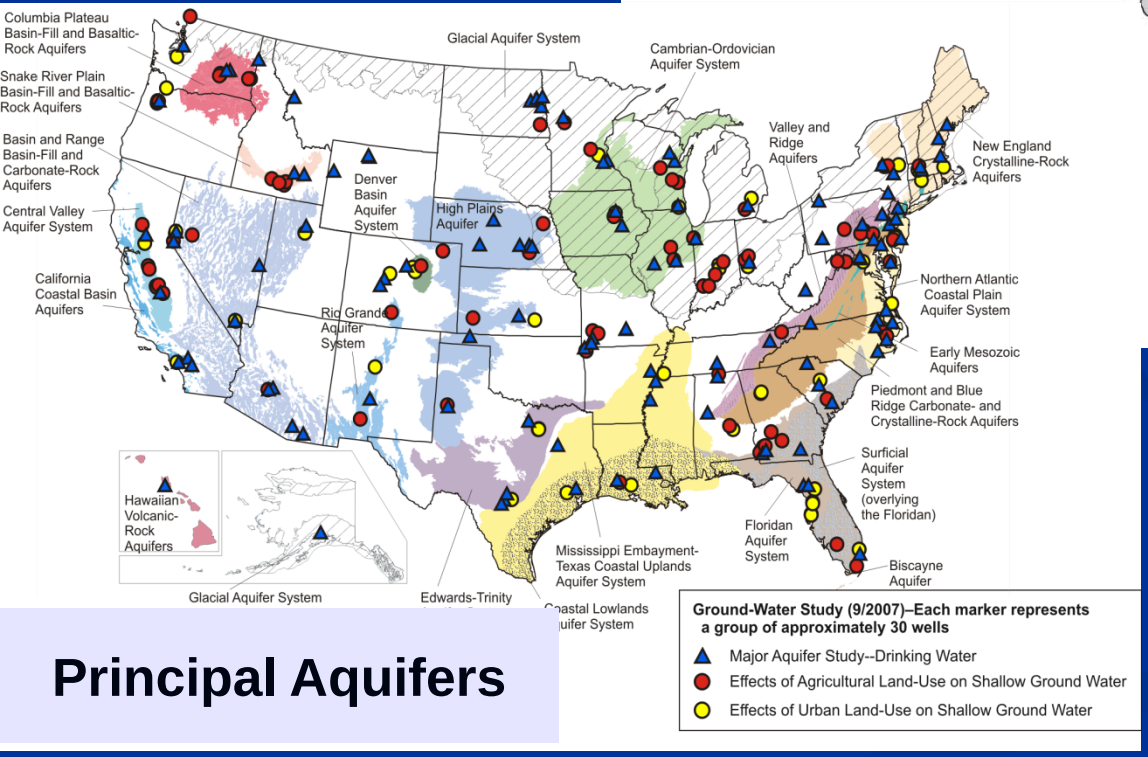
From study units to….



Major River Basins



Principal Aquifers

Regional Assessments

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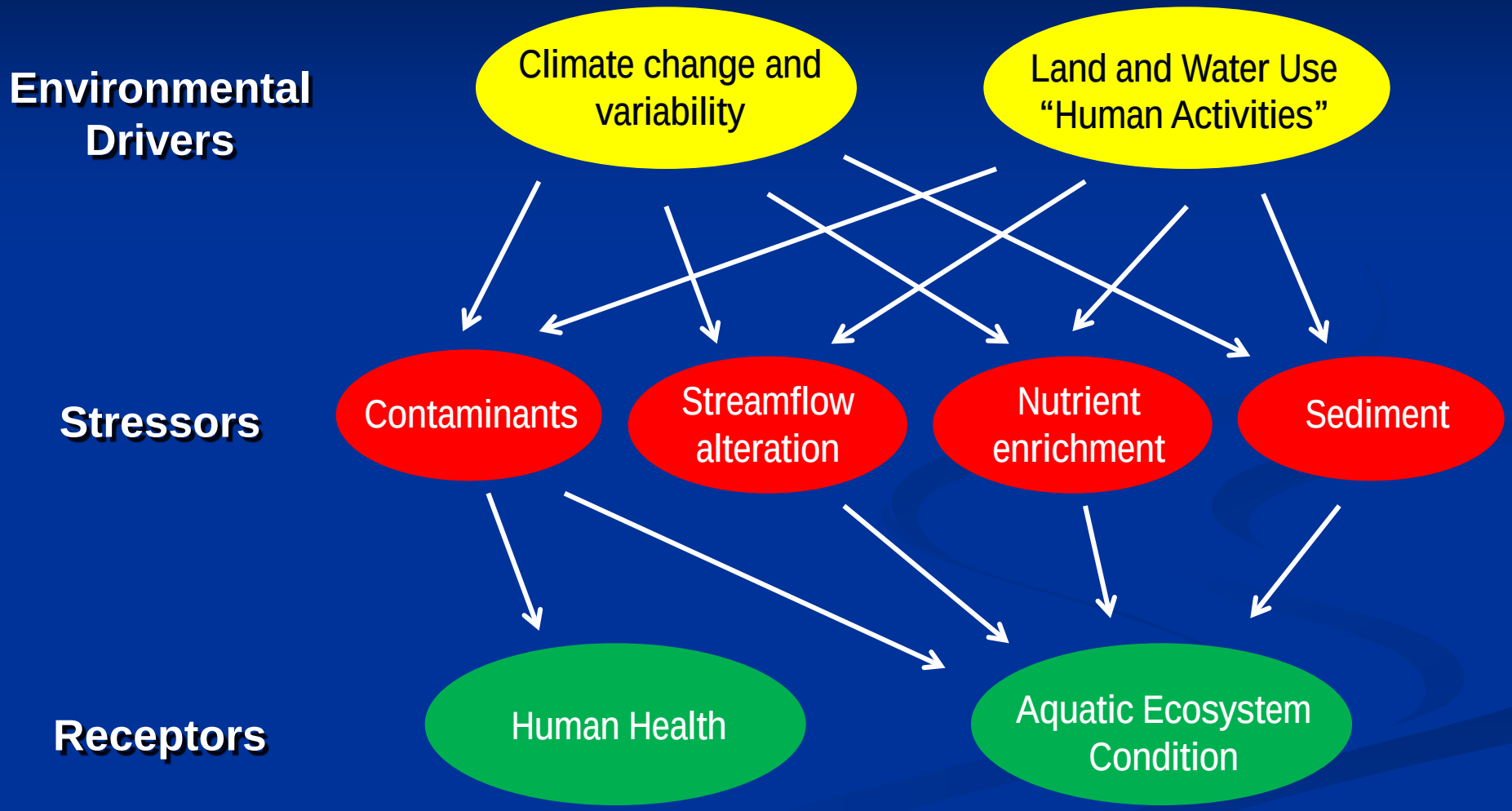
Cycle 3 Design Framework



Cycle 3 Goals -an extension of existing goals

- ✓ Status and Trends **What is current status of Nation's water quality and how is it changing over time?**
- ✓ Understanding

  -How do natural and human factors affect water quality and the key stressors that drive water quality?

  -How do key stressors (contaminants, excess nutrients, sediment, and streamflow alteration) affect aquatic ecosystems?
- ✓ Forecasting **-How will water quality and aquatic ecosystems respond to changes in human activities, management practices, and climate**

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Trend Assessment at Time Scales and Sensitivities Needed to Support Management

- Trends in Stressors: contaminants, nutrients, sediment, and streamflow alteration
- Trends in effects of stressors on ecological conditions

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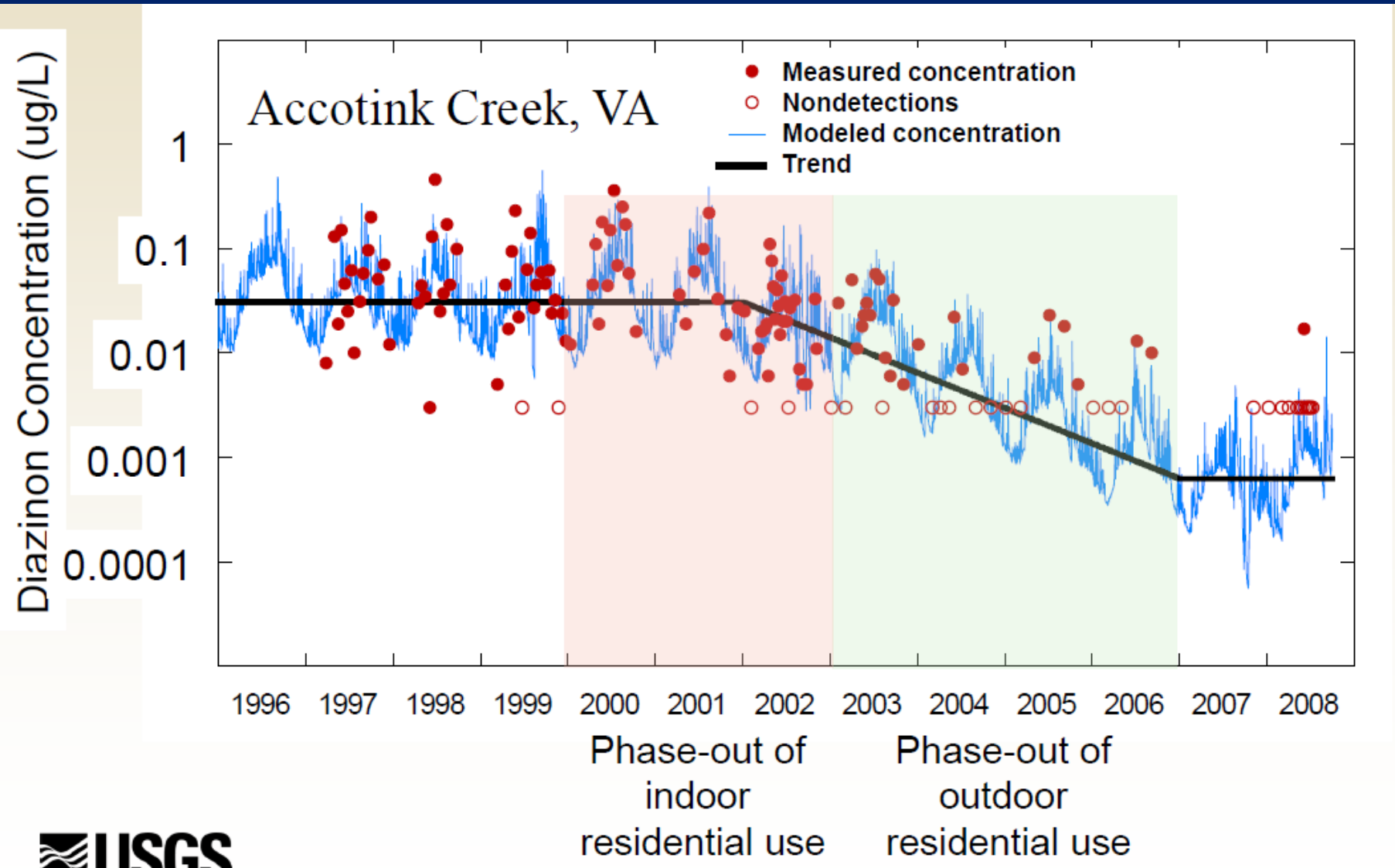
Cycle 3 Sampling Design Will Support Management-Relevant Trend Analysis



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Models and decision-support tools that link sources and management to water-quality benefits.

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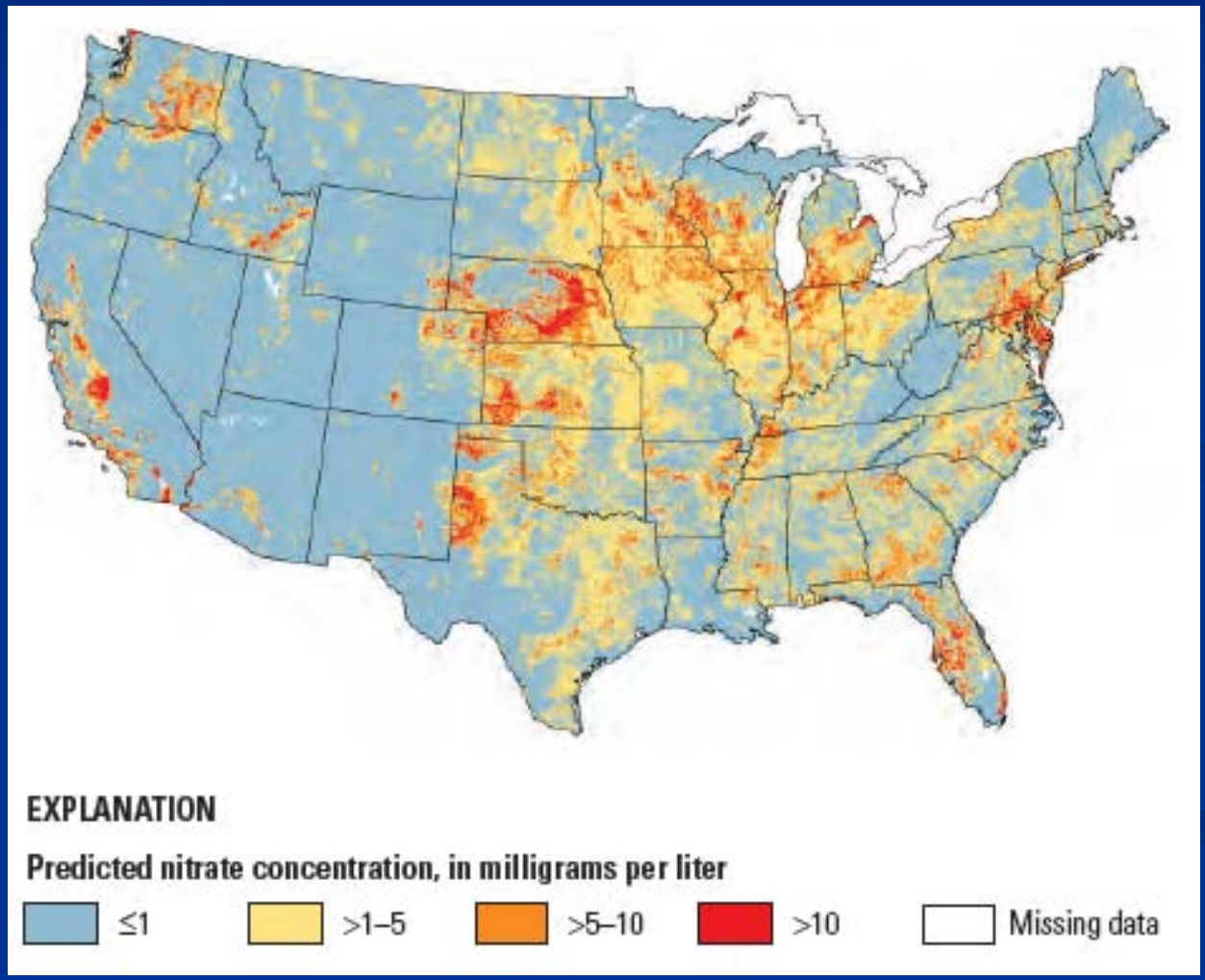
A model of nitrate in shallow groundwater provides a starting point for modeling transport to deeper water-supply aquifers



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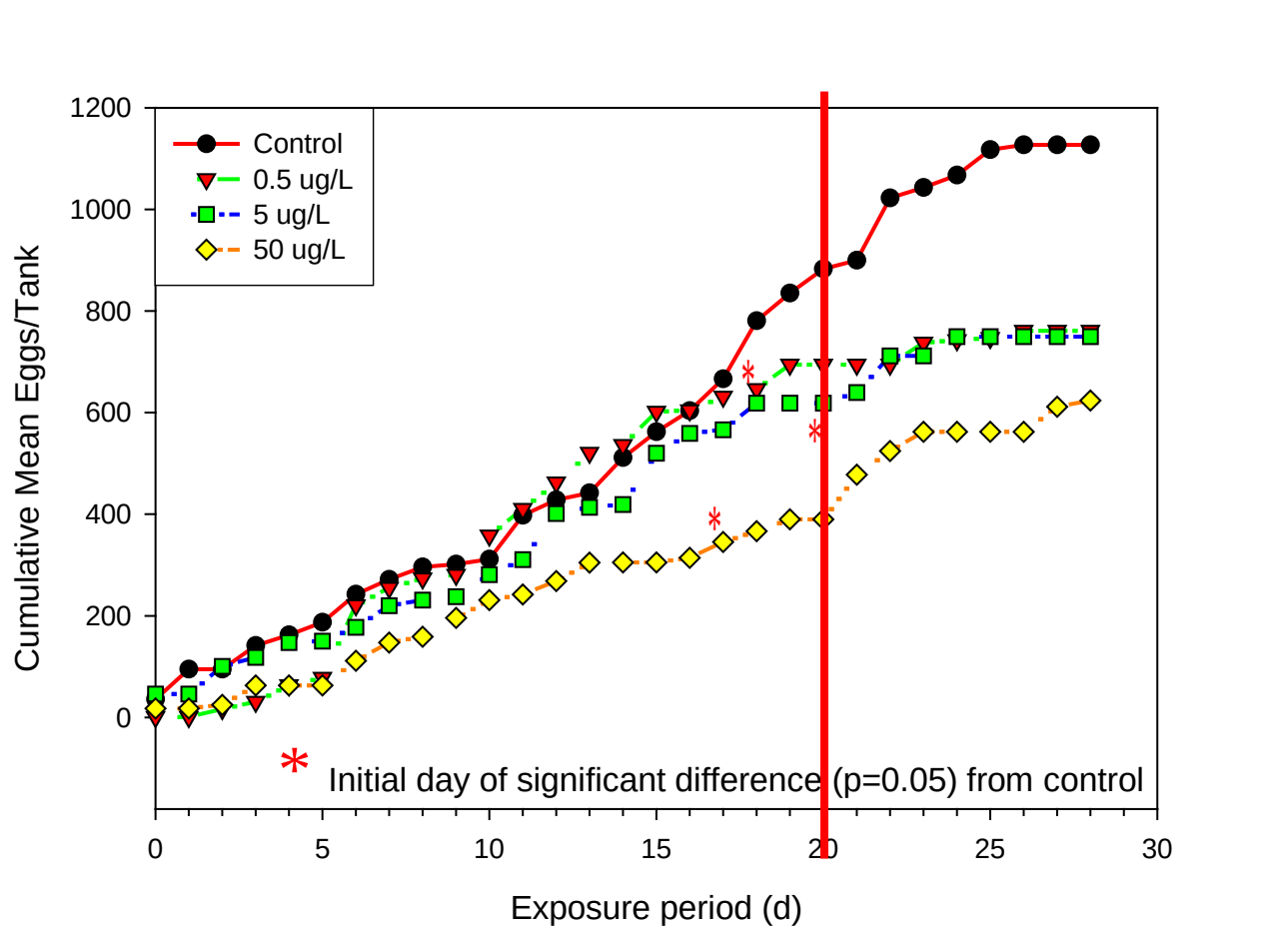
Lab studies showed that fish egg production was reduced by atrazine as low as 0.5 ug/L



By 21 days, all test levels showed effects

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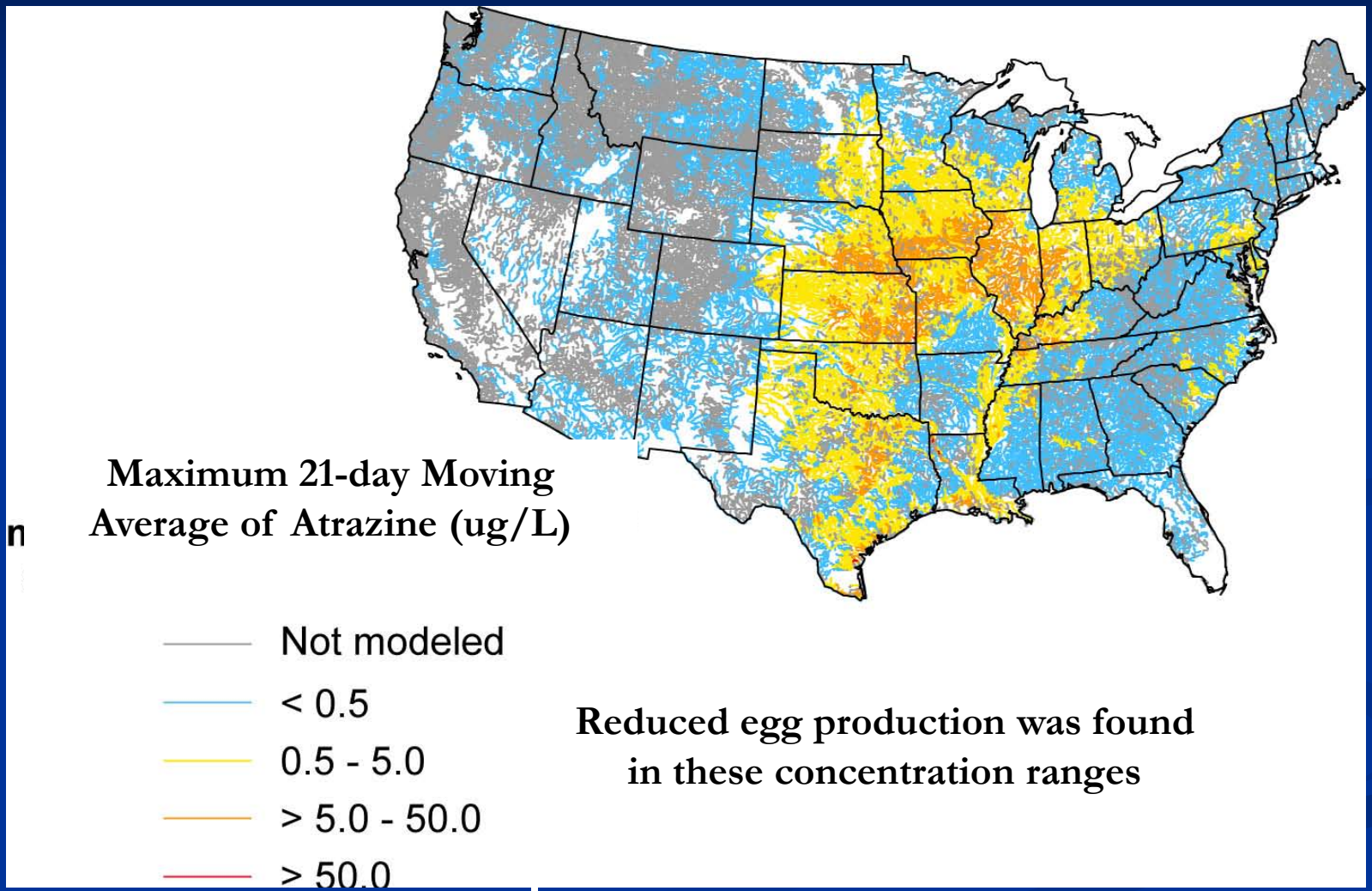
The model estimates the distribution of streams with atrazine concentrations that may affect egg production



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Understand cause-and-effect relations between stressors and ecosystem impacts so that management can target the most important causes.

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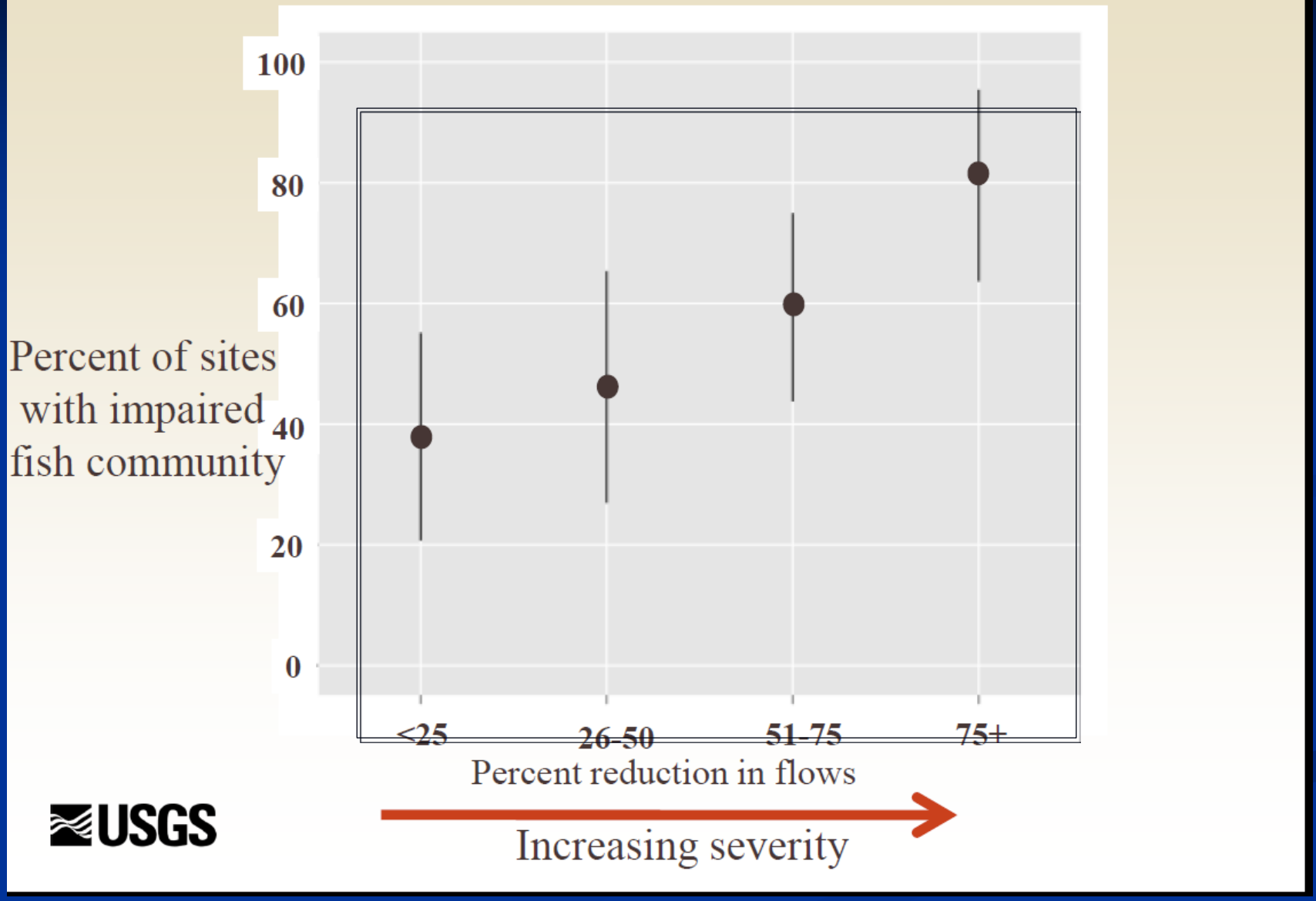
Reduced Minimum Flows Impact Fish



http://water.usgs.gov/nawqa/pubs/Carlisleetal_FLowAlterationUS.pdf

Forecasts of the effects of future conditions of land-use, management practices, and climate

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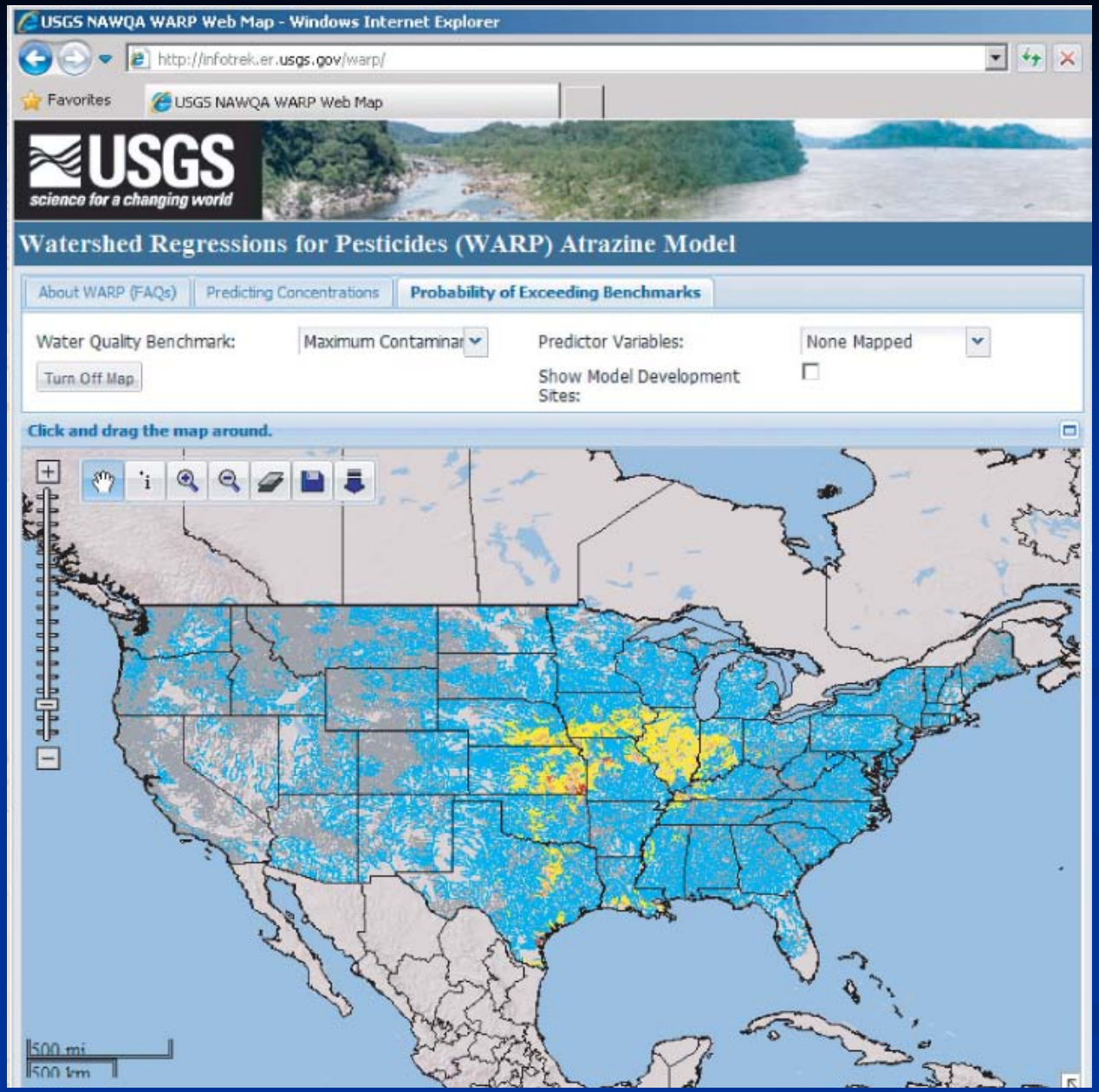
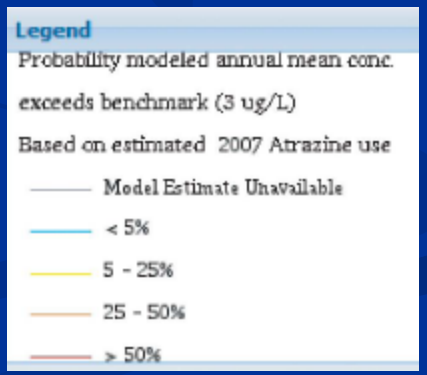
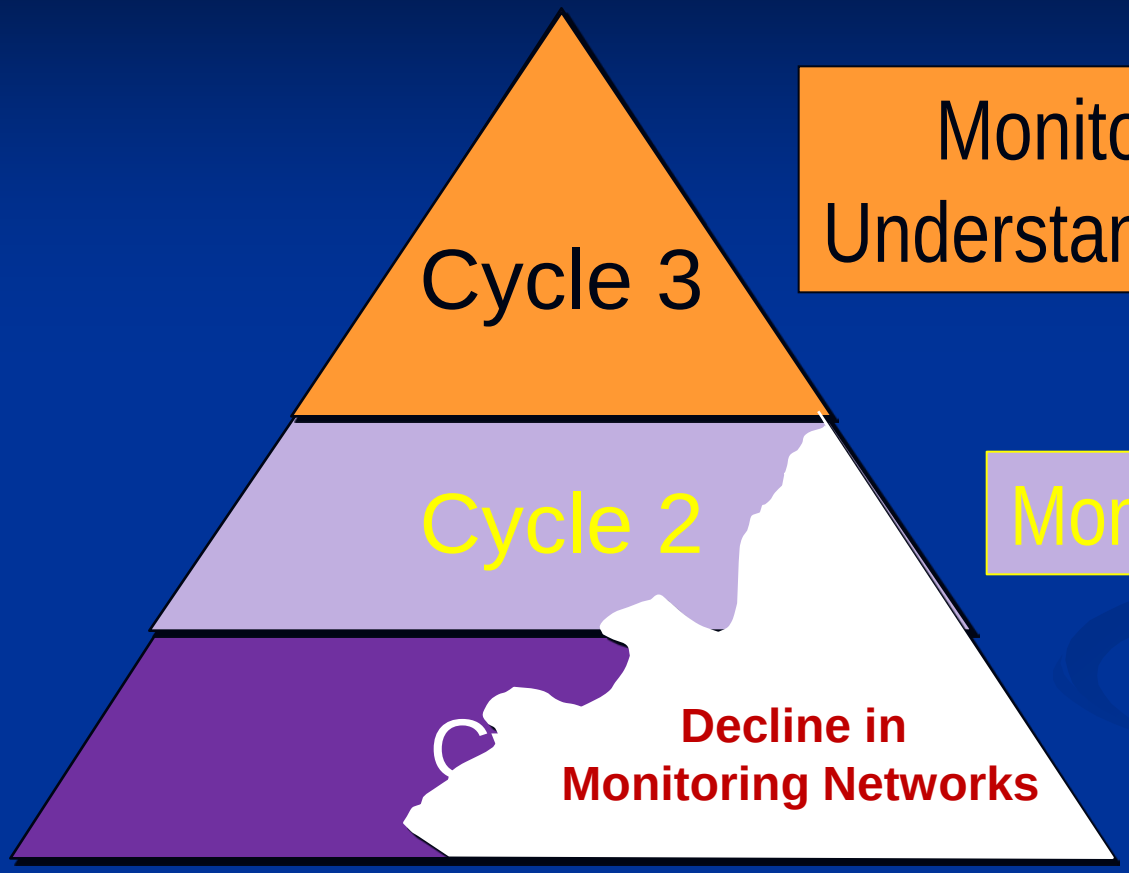
Interactive Web-based Atrazine Model: Example of MCL Exceedance Probability





http://infotrek.er.usgs.gov/warp/

Rebuilding the Foundation



Monitoring + Modeling + Understanding ⟶ Forecasting

Monitoring + Modeling

Monitoring

Status +Trends + Understanding

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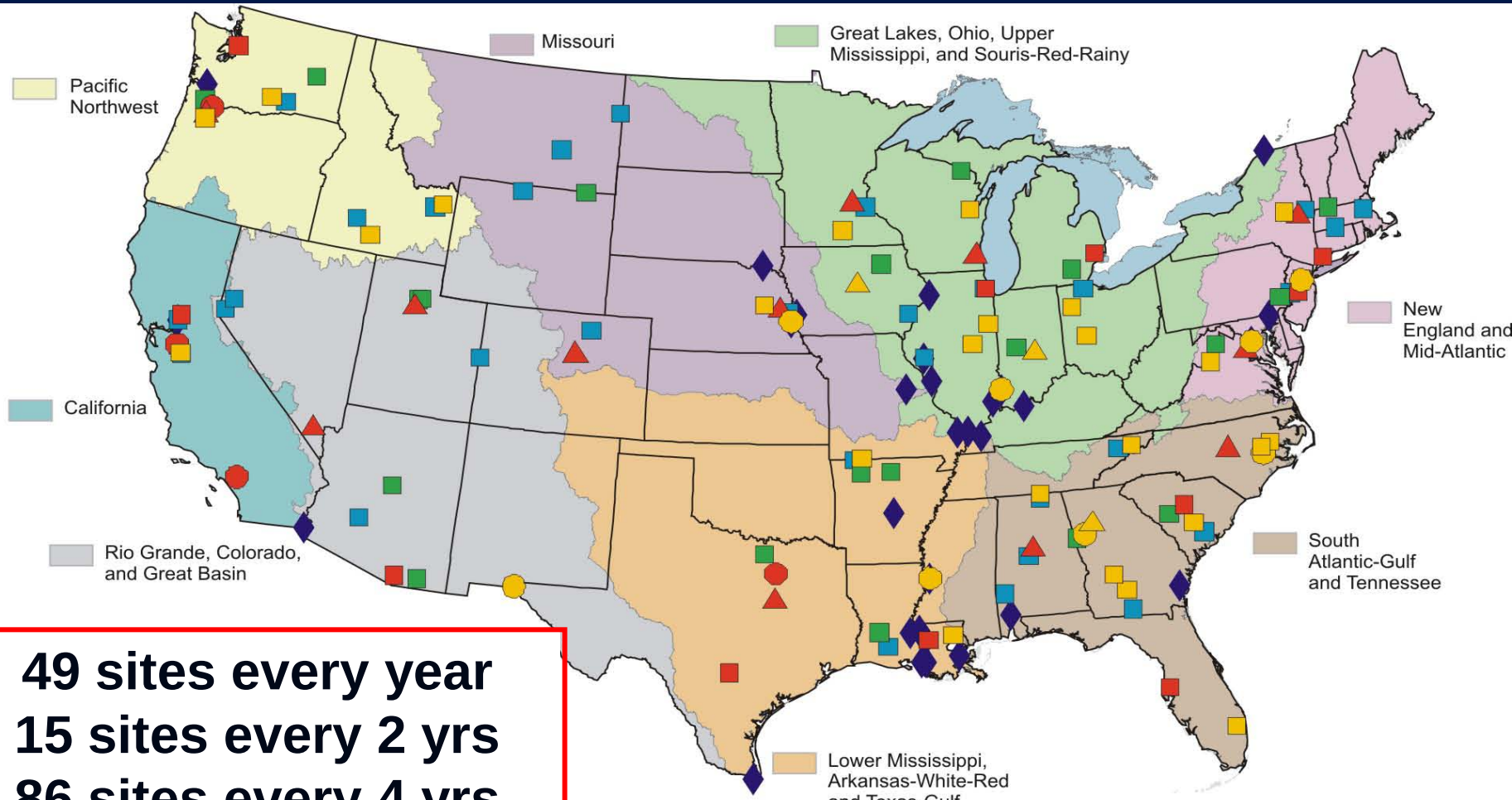
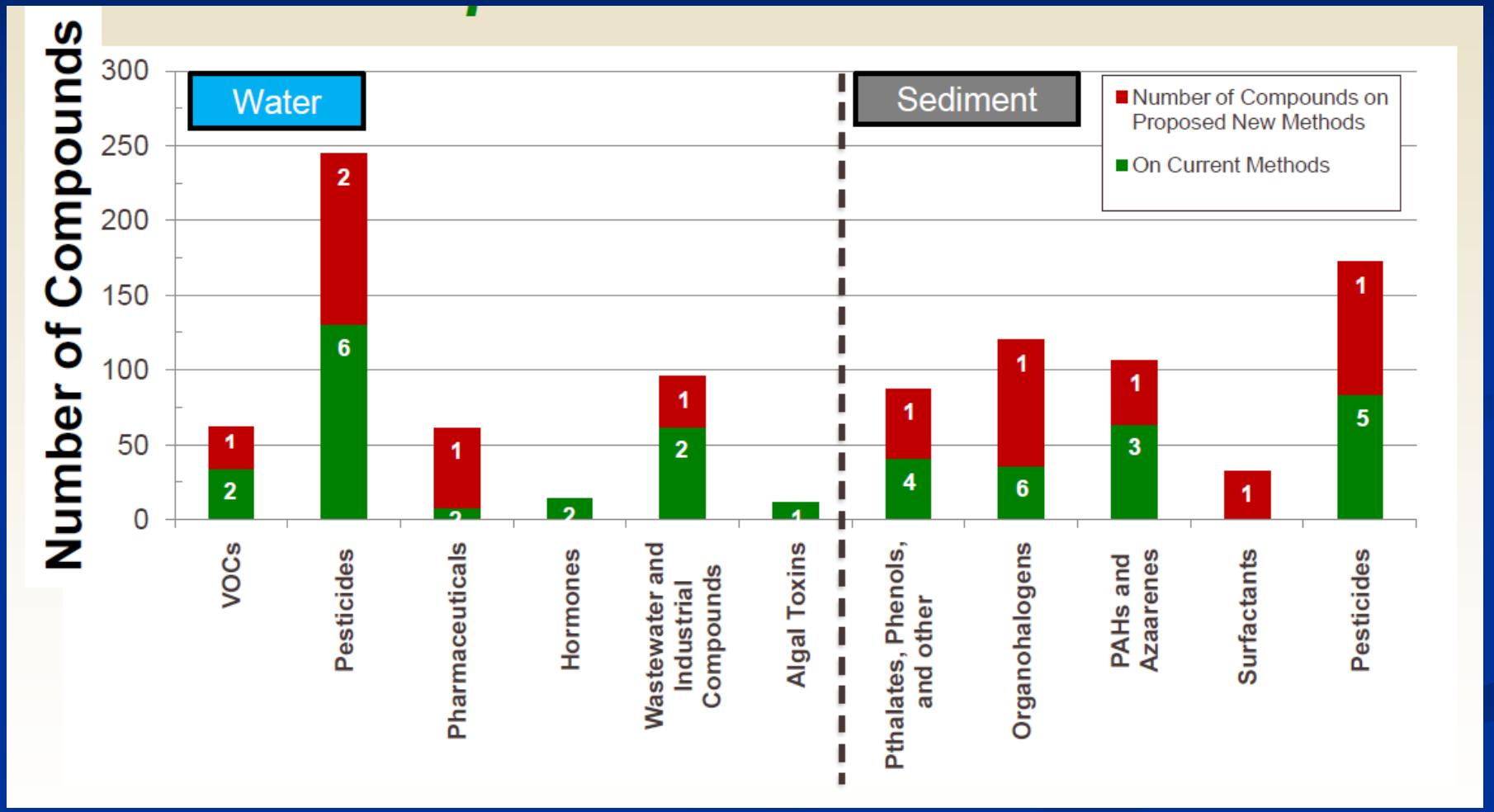
Current Fixed-Site Network



49 sites every year
15 sites every 2 yrs
86 sites every 4 yrs

New Analytical Methods:
More Compounds with Fewer Methods



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Restoration of the SW-Quality Network

Cycle 2

150 sites

Most only sampled every 2 or 4 yrs

No continuous monitors

58 ecological sampling sites

Single-year intake sampling

No lake or reservoir sites

Existing contaminant analyses

Minimal suspended sediment

Cycle 3

- ⇨ ~330 sites
- ⇨ All sites sampled all years
- ⇨ Most with real-time monitoring
- ⇨ 88 ecological sites (add 30 reference)
- ⇨ 25 stream or river DW intake sites
- ⇨ 50 lake or reservoir DW intake sites
- ⇨ Expanded contaminant coverage
- ⇨ Expanded suspended sediment with turbidity monitoring

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Critical Status Gaps Filled

- Update contaminant coverage
- Sources of public drinking-water supplies
  - Reservoirs and lakes
  - Principal aquifers
- Microbial contaminants in streams and rivers used for recreation
- Reference-site monitoring for tracking climate change and ecological background
- Loading of nutrients, contaminants and sediment to coastal waters

Cycle 3 plan provides starting point for integrating NAWQA assessment activities with other USGS Activities

- Key water-quality issues and science needs identified
- Provides water-quality foundation for other USGS Water activities such as Water Census
- Plan is aligned with and supports Programs in other Mission Areas (Ecosystems, Environmental Health, Global Change)
- 20 year foundation of data and science

What will the Nation gain from NAWQA Cycle 3?

- Critical status gaps filled
- Reliable and timely trend analyses
- Models and decision-support tools
- Causes of ecosystem impacts
- Forecasts of future conditions

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Questions

- ✓ What resonates with you?
- ✓ How does NAWQA gain support for the science plan?
- ✓ Any additional suggestions going forward?

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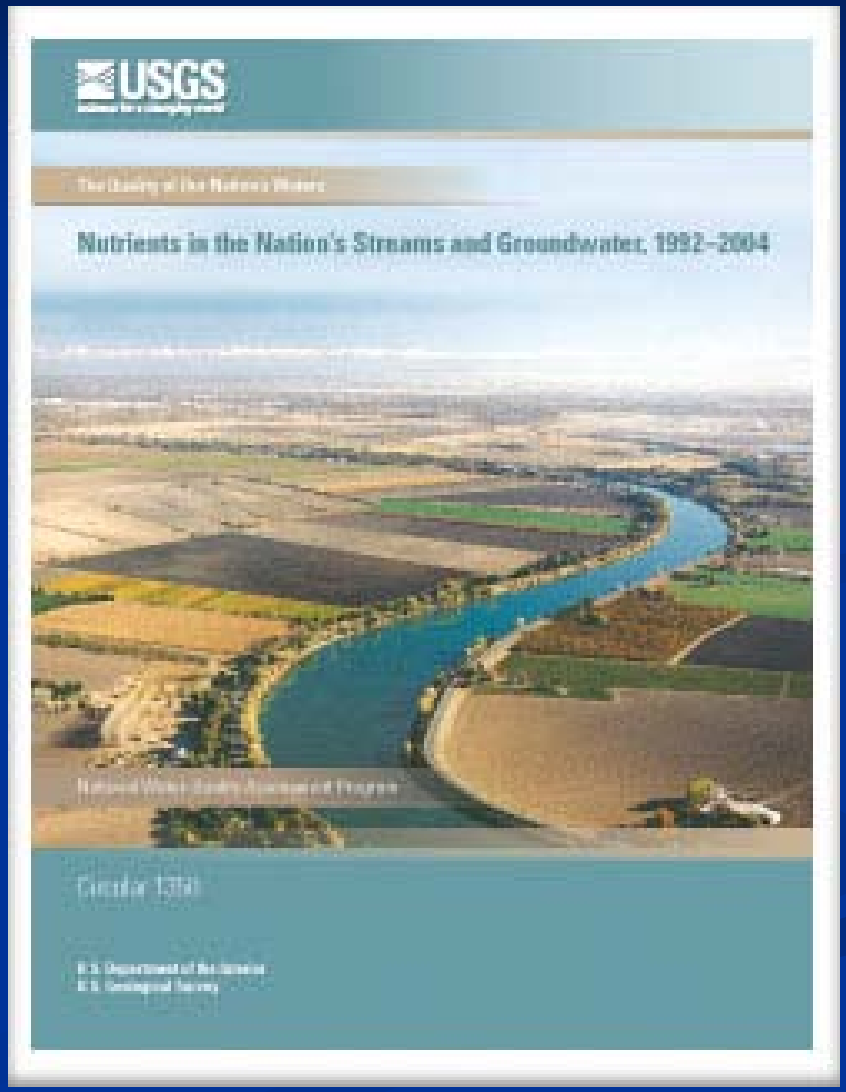
Products and Briefings

- National Circular on Nutrients (last fall)
- Flow Alteration (recent journal article)
- National Circulars coming this fall and winter with briefings
  - Effects of Urbanization on Stream Ecosystems
  - National Synthesis of NAWQA Ecological Studies



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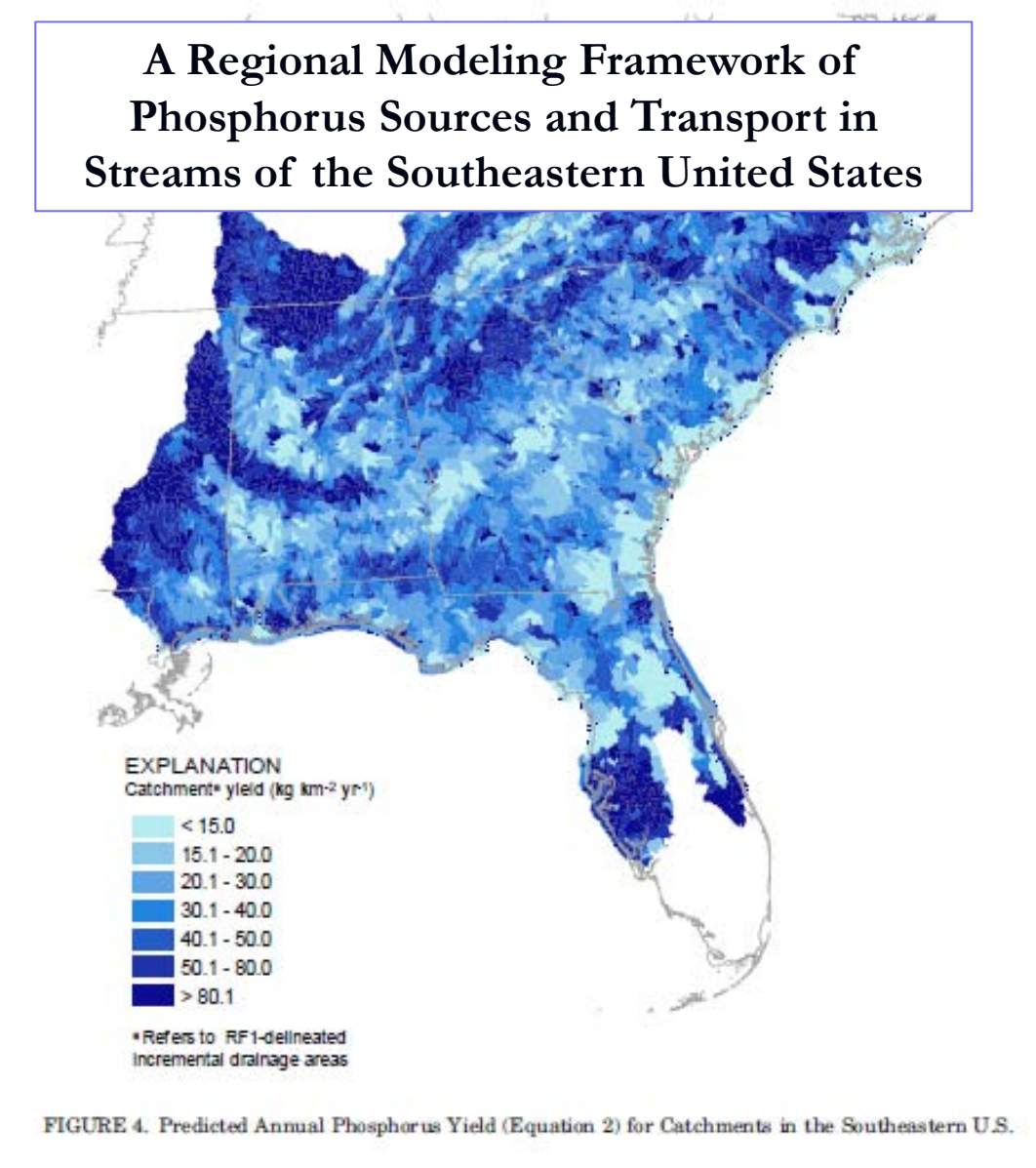
SPARROW model special volume in JAWRA

- 13 papers available to the public on-line
- Briefing in October or November 2011

BioData to be released



http://water.usgs.gov/nawqa/pubs/phosphorus_streams/