



An Update on Planning the Third Decade (Cycle 3) of the NAWQA Program

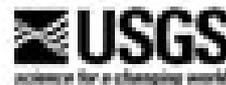
National Water Quality Monitoring Council meeting
Reston, VA

July 14, 2010

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NAWQA Cycle 3 Planning Team
Denver, Colorado

Initial Feedback on Priority Issues

- Climate Change and Variability
- Land-Use and Demographic Change
- Hydrologic Modification and Water Re-use
- Effectiveness of Policy, Regulations and BMPs
- Effects of Energy/Resource Development
- Common Chemical and Microbial Contaminants
- Emerging Contaminants
- Excess Nutrients
- Multiple Stressors
- Sediment
- Streamflow Alteration



Design of Cycle 3 of the National Water-Quality Assessment Program, 2013–2023:

Part 1: Framework of Water-Quality Issues and Potential Approaches

Critical Issues

Excess nutrients

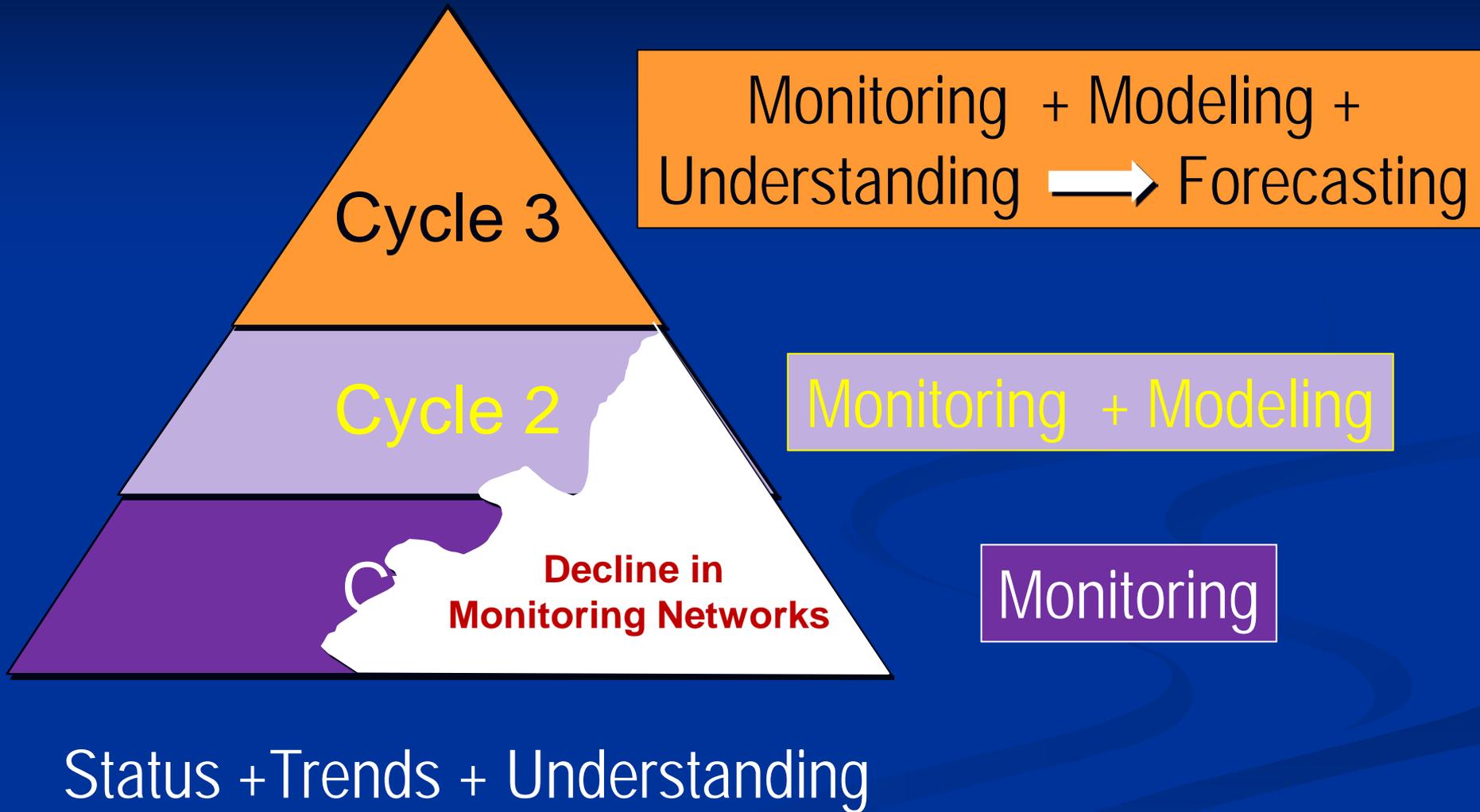
Contaminants

Sediment

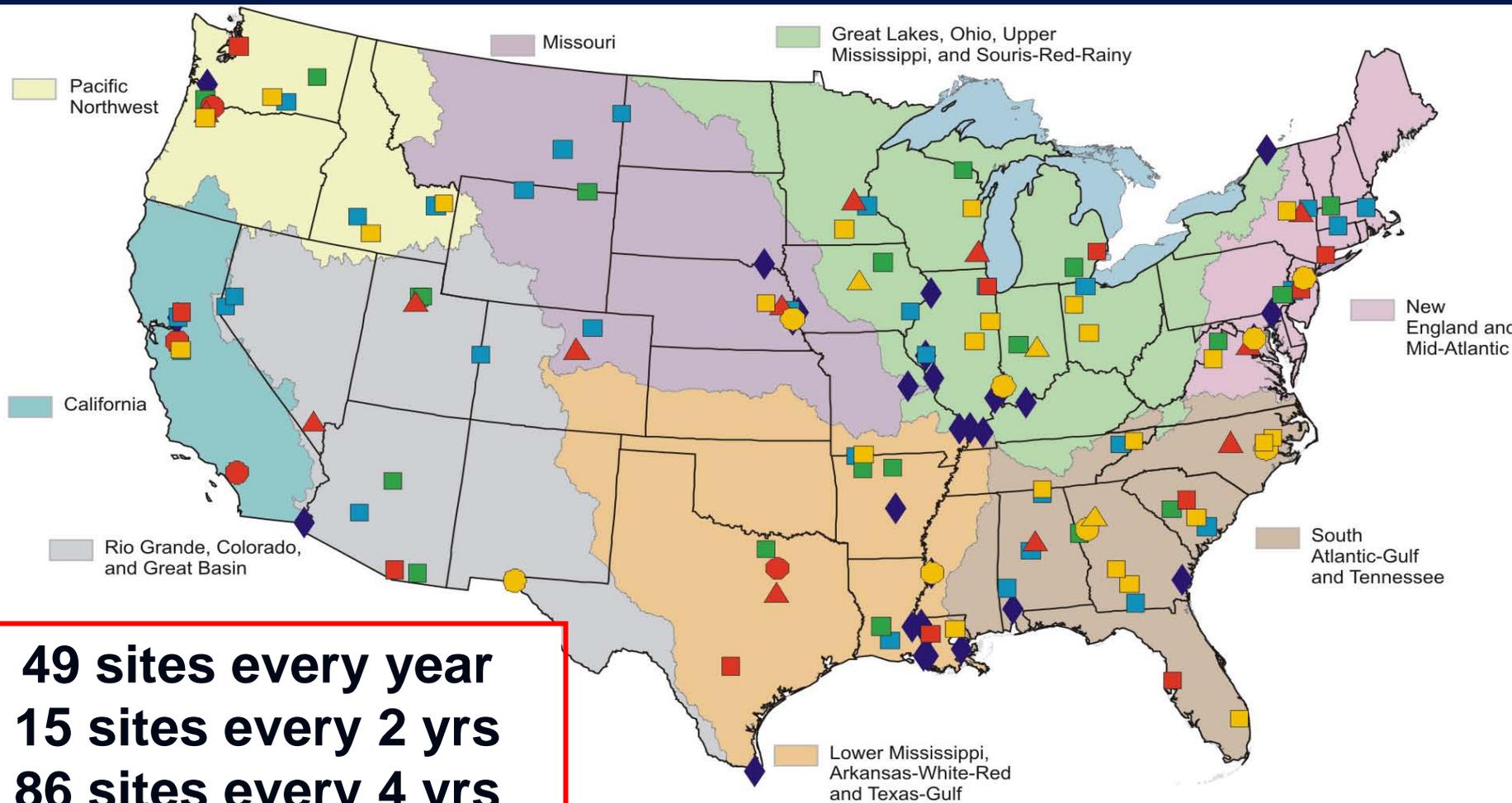
Streamflow Alteration



Rebuilding the Foundation



Current Fixed-Site SW-QW Network





Possible Changes for Fixed-Site Network

Current Network

Cycle 3 Network

150 sites

⇒ ~310 sites

Most only sampled every 2 or 4 yrs

⇒ All sites sampled all years

No continuous monitors

⇒ Most with real-time monitoring

58 ecological sampling sites

⇒ 88 ecological sites (30 reference)

Single-year intake sampling

⇒ 10-yr sampling at 70 DW intakes

No lake or reservoir sites

⇒ 50 lake or reservoir DW intake sites

13 coastal sites

⇒ 46 coastal sites (33 NASQAN)

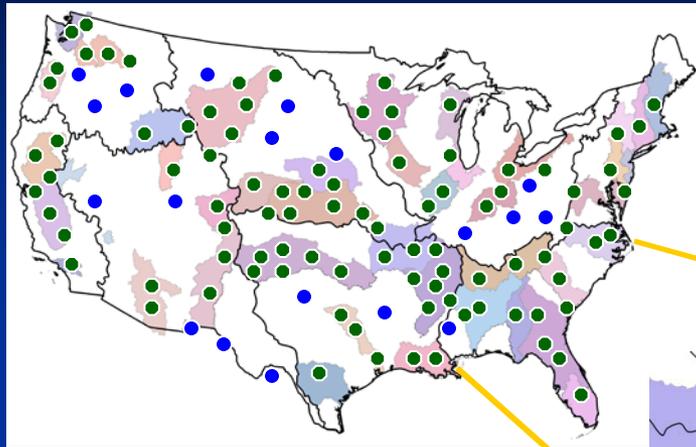
Existing contaminant analyses

⇒ Expanded contaminant coverage

Minimal suspended sediment

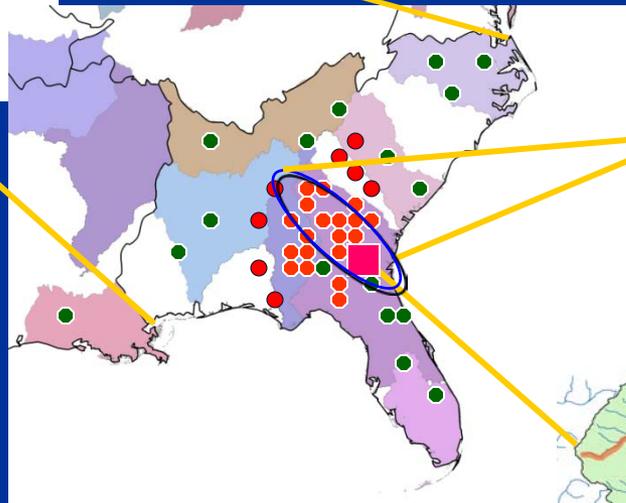
⇒ Suspended sediment and turbidity

Scale of SW/Ecology Studies



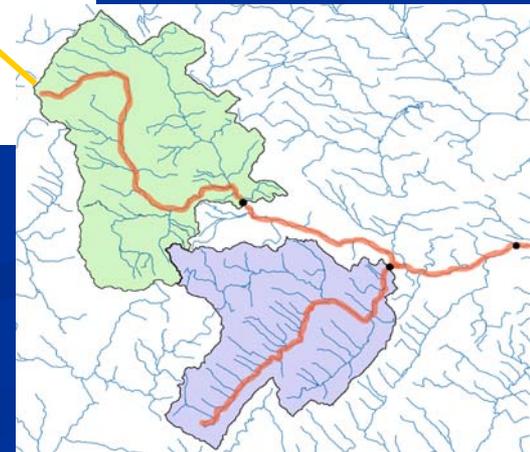
National Fixed Site Network

Regional Synoptic Studies



Integrated Watershed Assessments

Local-Scale Studies



New Design Features

Real-Time Water-Quality Monitoring

Continuous monitoring of temp, spec cond, DO, and turbidity

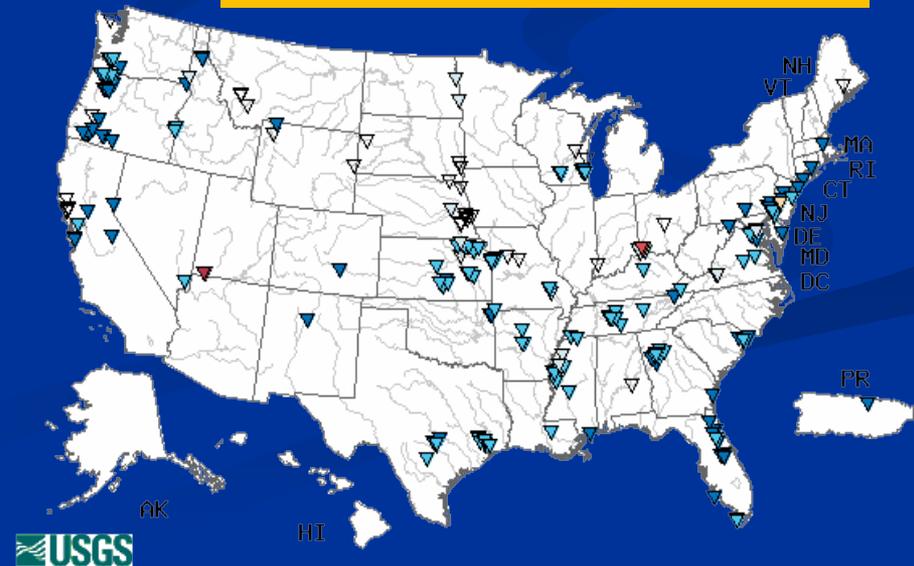
Provides surrogates for sediment, bacteria

Improved temporal resolution (storms)

More accurate load estimates

Richer data sets for calibration

Real-Time Turbidity Stations



New Design Features

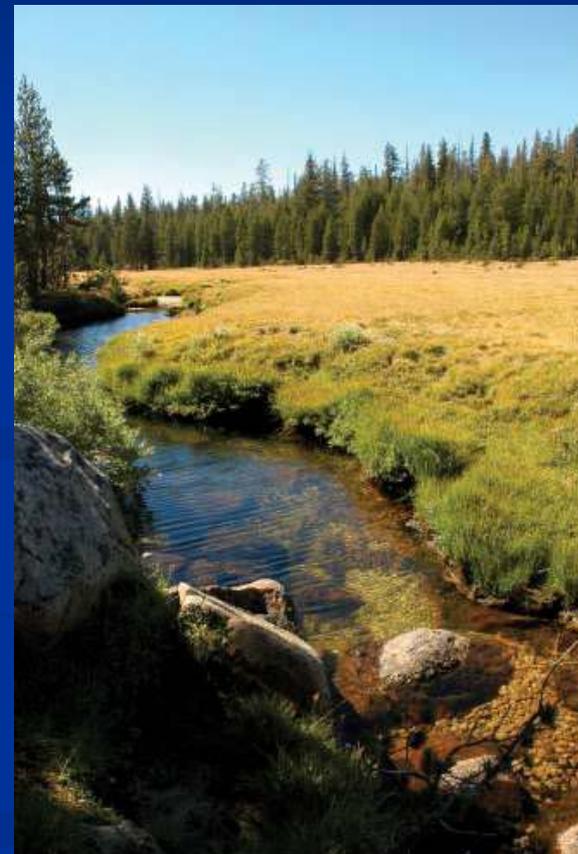
More Reference Sites

Provides benchmarks for evaluating:

- biological condition
- background concentrations
- effects of changing climate

All sites sampled annually

Build and maintain a National Reference Site monitoring network



New Design Features

Dynamic Models  Forecasting

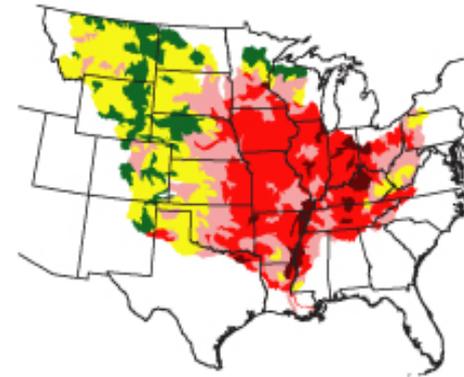
Go from “average” conditions to “time-varying”

Range of time scales: (monthly, seasonal, annual)

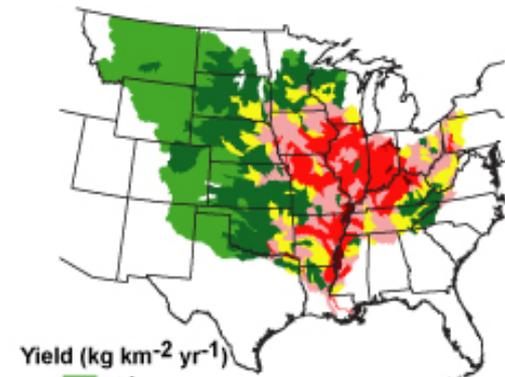
To do this we need:

- contaminant concentrations/loads over time
- ancillary data over time (satellite data?)
- understanding studies

Phosphorus Yield to Gulf of Mexico (spring)



Phosphorus Yield to Gulf of Mexico (fall)



Yield ($\text{kg km}^{-2} \text{ yr}^{-1}$)



New Design Features:

Lake and Reservoir Intake Monitoring

Important source-water category

Start with drinking-water intakes

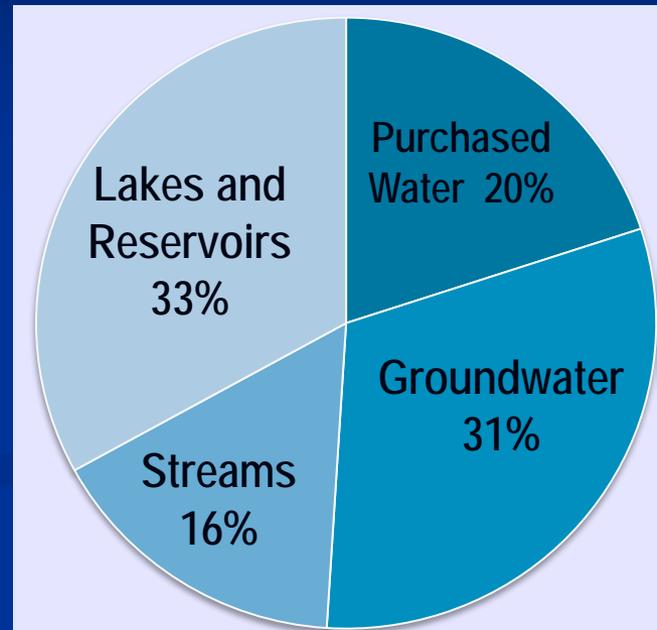
Pilot understanding studies

Human health focus:

Organic contaminants

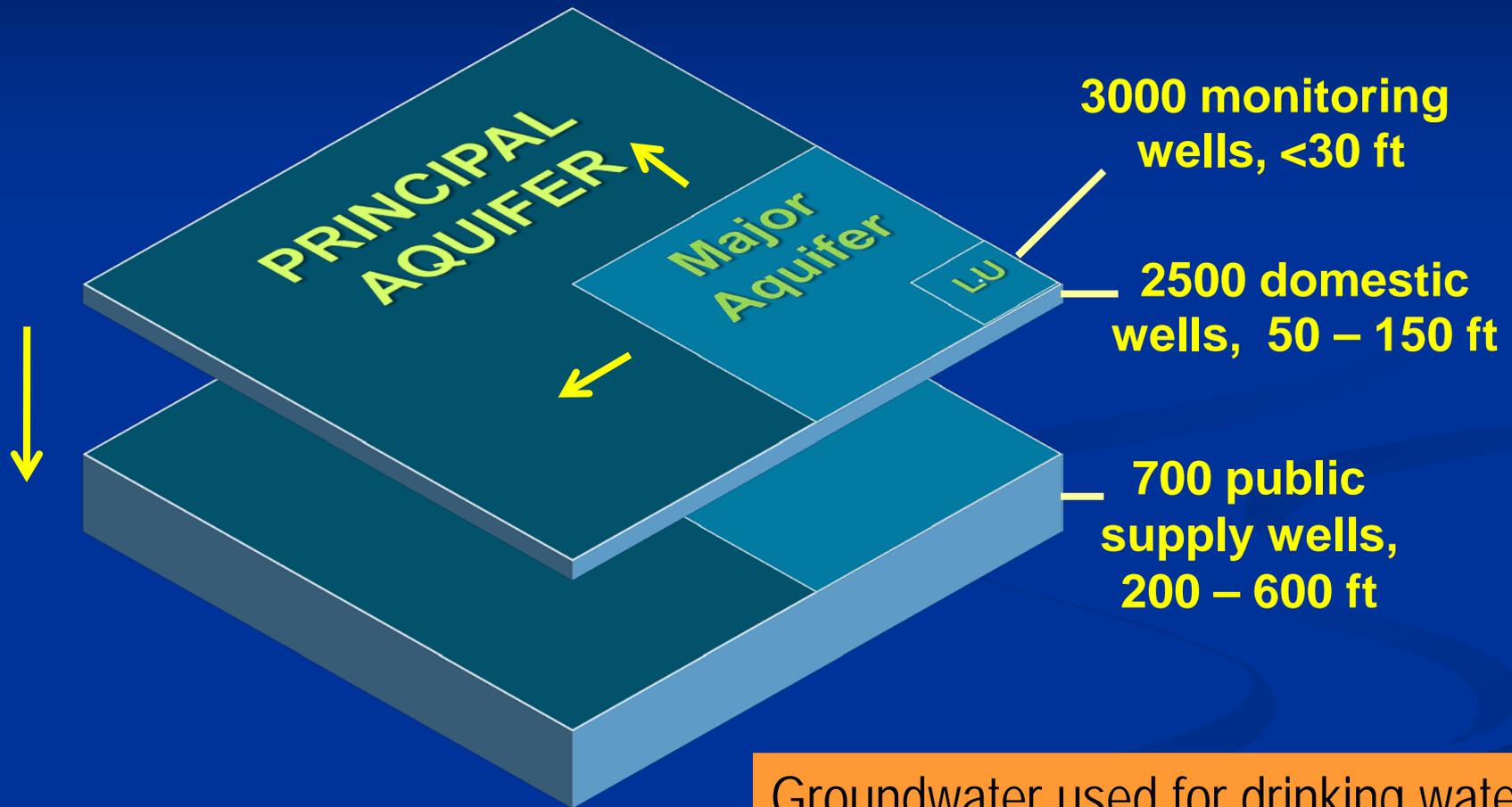
Algal toxins,

Pathogens



New Design Features

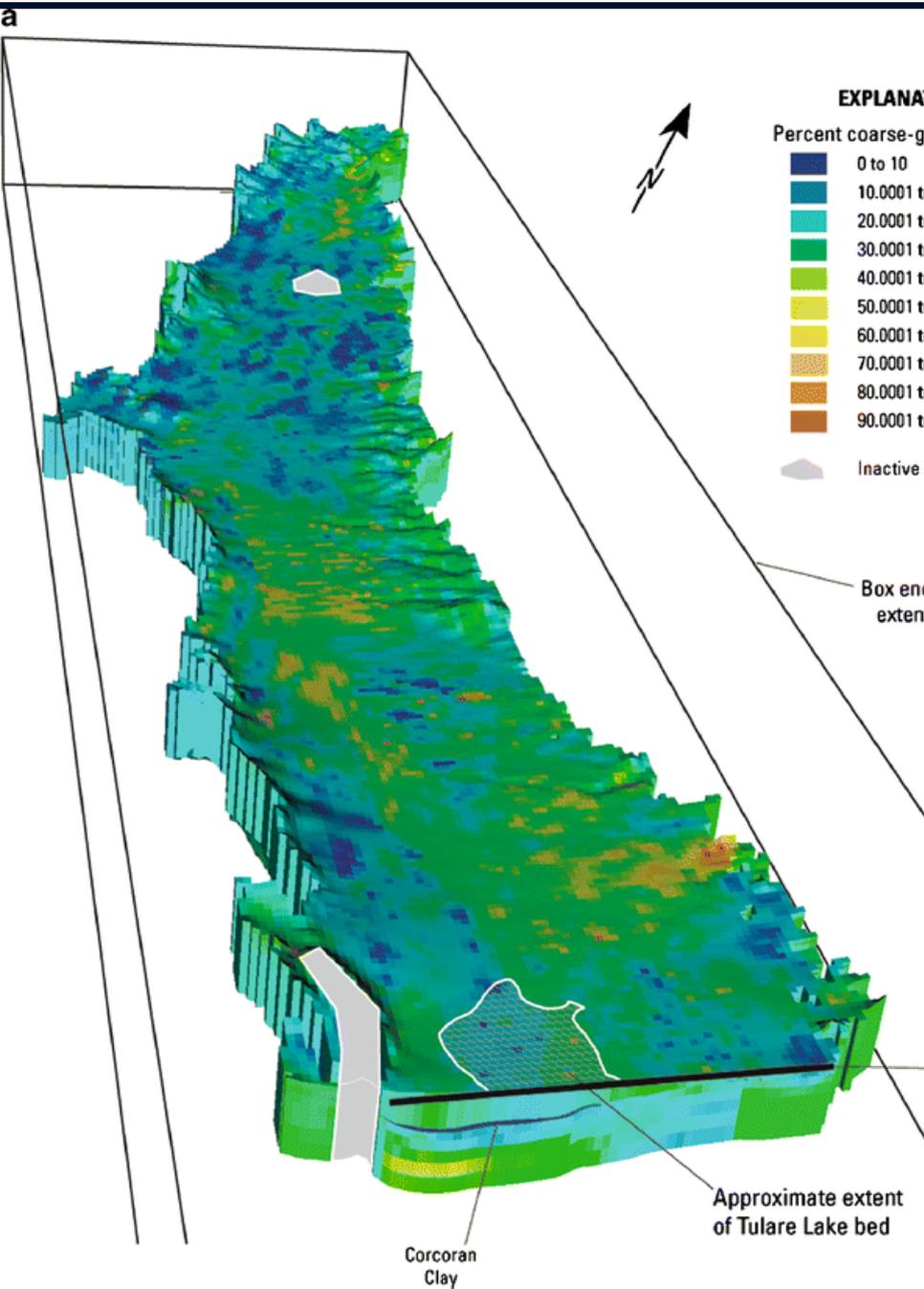
Deep Groundwater and Public Supplies



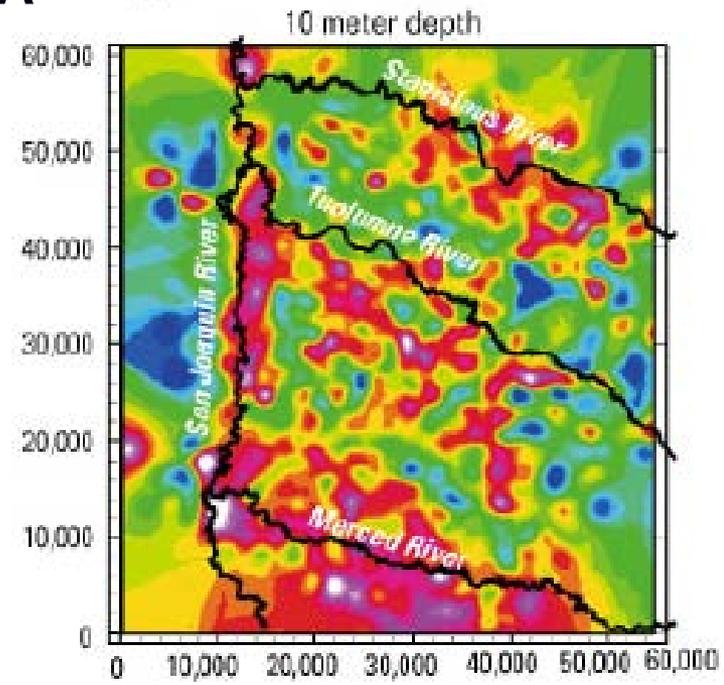
Groundwater used for drinking water:

82% Public supply, 18% Domestic

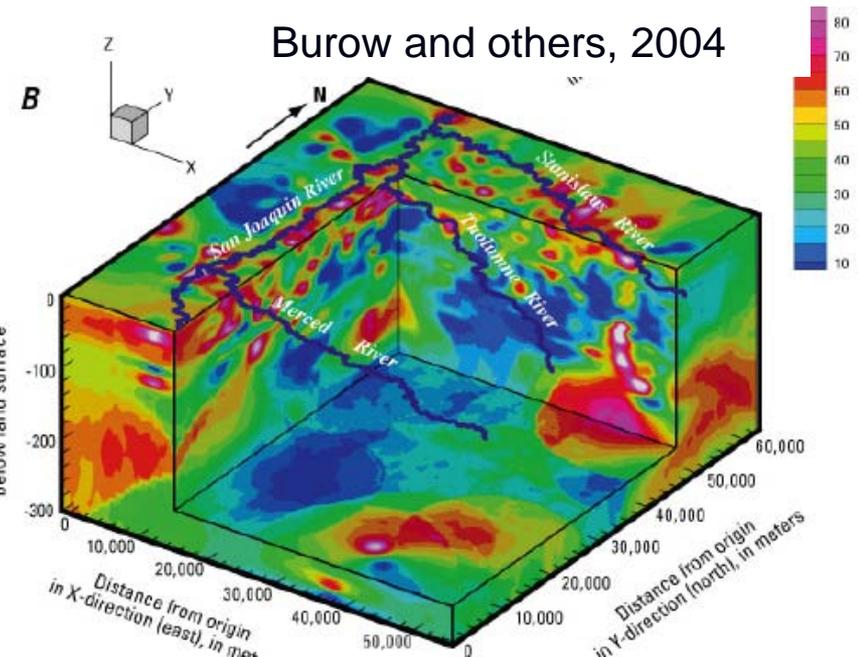
3-D modeling of San Joaquin Valley aquifer, CA



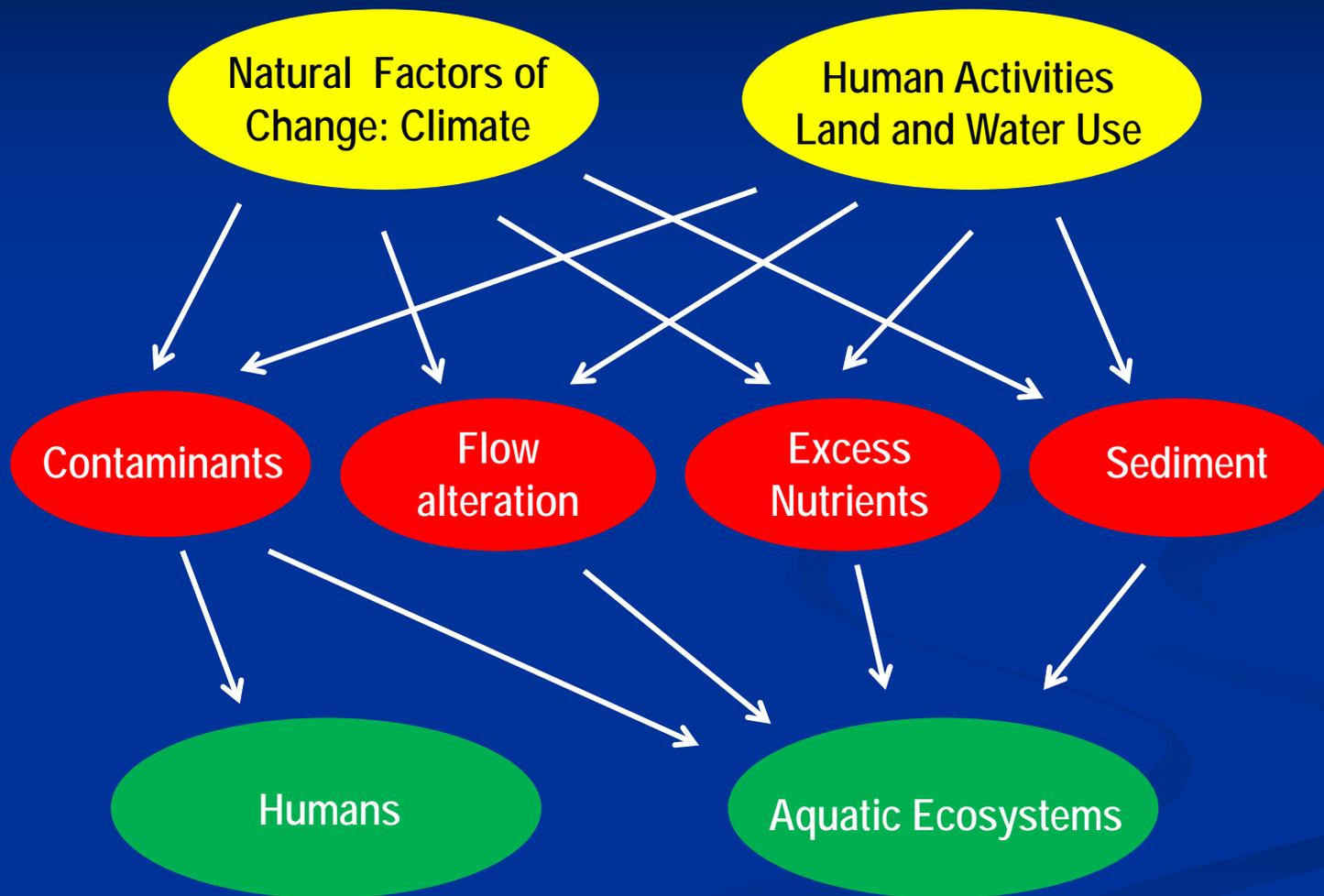
A



Burow and others, 2004



Cycle 3 Design Framework



We can't do this alone!

“National Assessment”

EPA

NAWQA

WaterSMART

NOAA

USDA

**Groundwater
Resource Program**

**National Streamflow
Information Program**

**State and Local
Agencies**

Next Steps

Finalize details of draft Cycle 3 design and evaluate options under different budget scenarios (mid-Sept)

Meet with National Research Council Committee (October 26)

Discuss science plan priorities with stakeholders (Nov 19)

Complete final draft of science plan and begin implementation planning



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