

Toward Sustainable Water Information

Presented to the National Water Quality
Monitoring Council

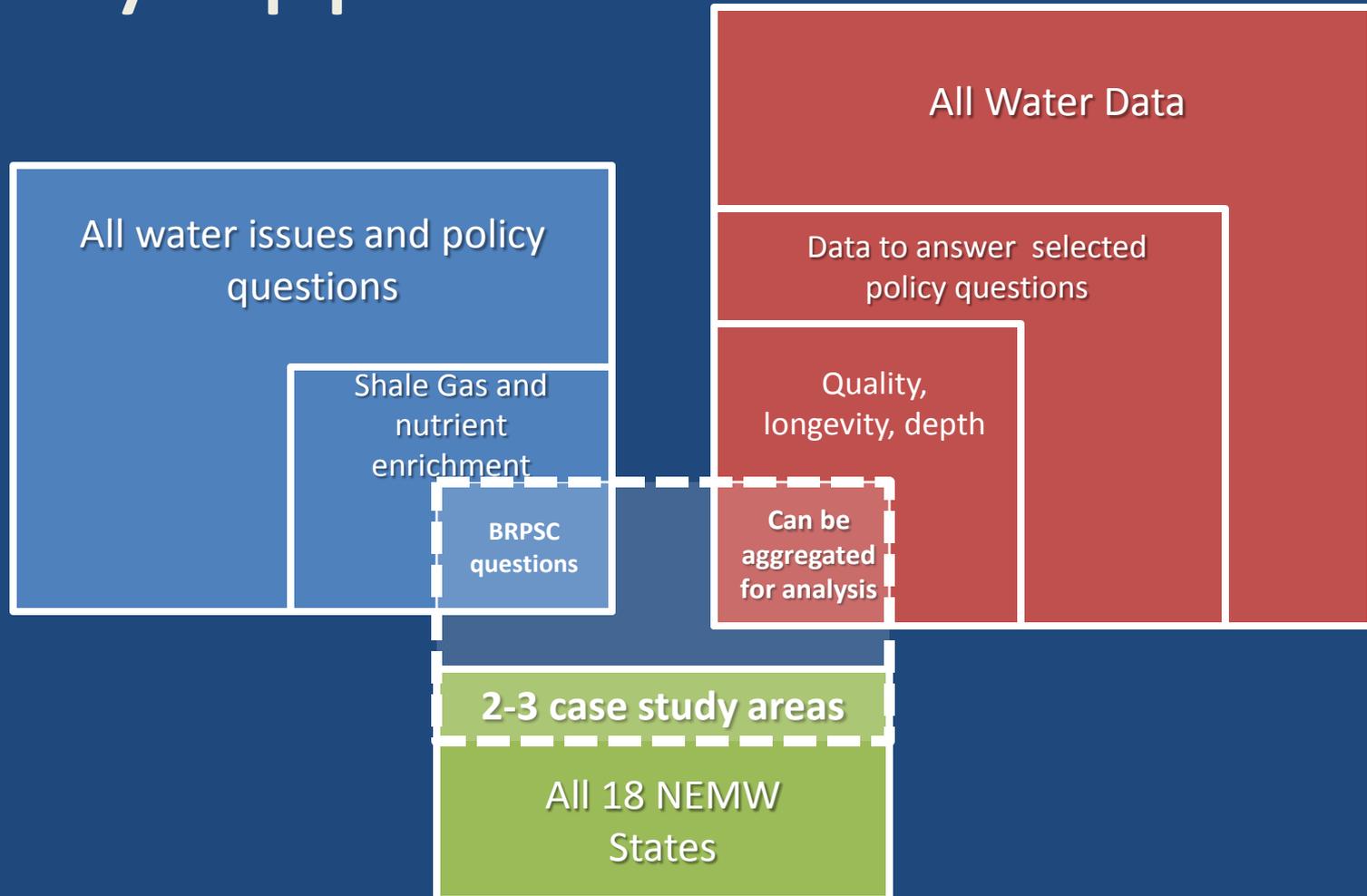
November 27, 2012



Problem Statement

- Do we have the water monitoring and data analysis capacity to answer the science and management questions that need to be addressed in order to make informed policy decisions?
- Do we have the current and ongoing water monitoring and data analysis capacity to know if our water resources are at risk?

Study Approach



TSWI Case Studies

Define for each case study:

- Policy Question
- Data Questions
- Geography
- Criteria for identifying required data
- Analysis required

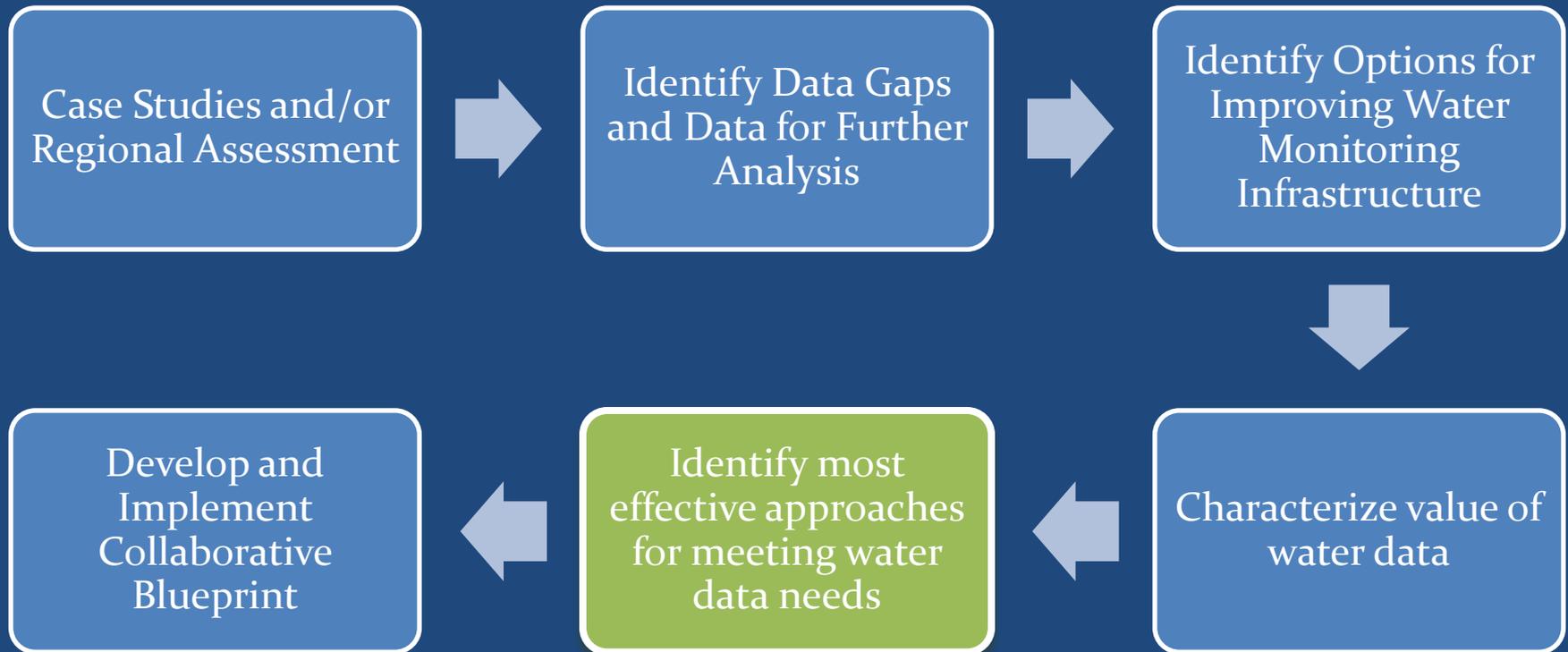
Steps for each case study:

- Define all the items in the left box
- Collect available data
- Outline data analysis process required to answer the data questions
- Determine whether existing data meet criteria
- Identify data gaps
- Identify opportunities to collect data or analyze more efficiently

Case Study Results:

- What data and analysis capacity we have to answer the question
- What we can know about the question from existing monitoring programs
- What we are unable to know about the question from existing monitoring programs
- What additional monitoring would improve ability to answer the data questions

Study Approach (cont'd)



Project Schedule

2013 Report: State of the NEMW
Region's Water Information



2014 Develop Collaborative
Blueprint



2015 Implement Collaborative
Blueprint



2017 Evaluate Progress

First Year Goals and Objectives

- Draw attention to the role and value of water monitoring and data
 - Characterize benefits of water monitoring
- Evaluate the region's existing water monitoring capacity using example case studies
 - Identify data gaps
- Develop options for improvement

Blue Ribbon Project Steering Committee Role

- Keep the project relevant to the most pressing concerns and policy issues facing the region
- Select policy questions to be evaluated
- Frame issues for the TAC
- Help us answer:
 - How can water data investments better align with management objectives?
 - How can our project best improve the water information you receive as a decision maker?

BRPSC Members

Name	Organization
Allegra Cangelosi	Northeast-Midwest Institute
Blayne Diacont	Range Resources
Bob Tudor	Delaware River Basin Commission
Carlton Haywood	Interstate Commission on the Potomac River Basin
James Miller	Organic Valley
Jeff Myers	New York DEC
Jeff Stoner	USGS
Jennifer Hoffman	Chesapeake Energy
Joe Depinto	Limnotech
Jonathan Higgins	The Nature Conservancy
Judy Beck	EPA Region 5
Julius Ciaccia	Northeast Ohio Regional Sewer District
Laura Rubin	Huron River Watershed Council
Mark Walbridge	Agricultural Research Service, USDA
Paul A. Biedrzycki	City of Milwaukee Health Department
Susan Weaver	Pennsylvania DEP
Susy King	New England Interstate Water Pollution Control Commission
Suzanne Bricker	NOAA's National Estuarine Eutrophication Assessment
Ted Yuzyk	International Joint Commission
Tim Eder	Great Lakes Commission

Technical Advisory Committee Role

- Provide scientific and technical feedback to the project
- Provide subject expertise on policy questions
- Design technical aspects of case studies around the policy questions
- Identify the following for each policy question:
 - Data needs and criteria
 - Data sources
 - Data quality
 - Ability to aggregate data from different sources
- Identify water data gaps and opportunities for improving efficiencies from a technical perspective

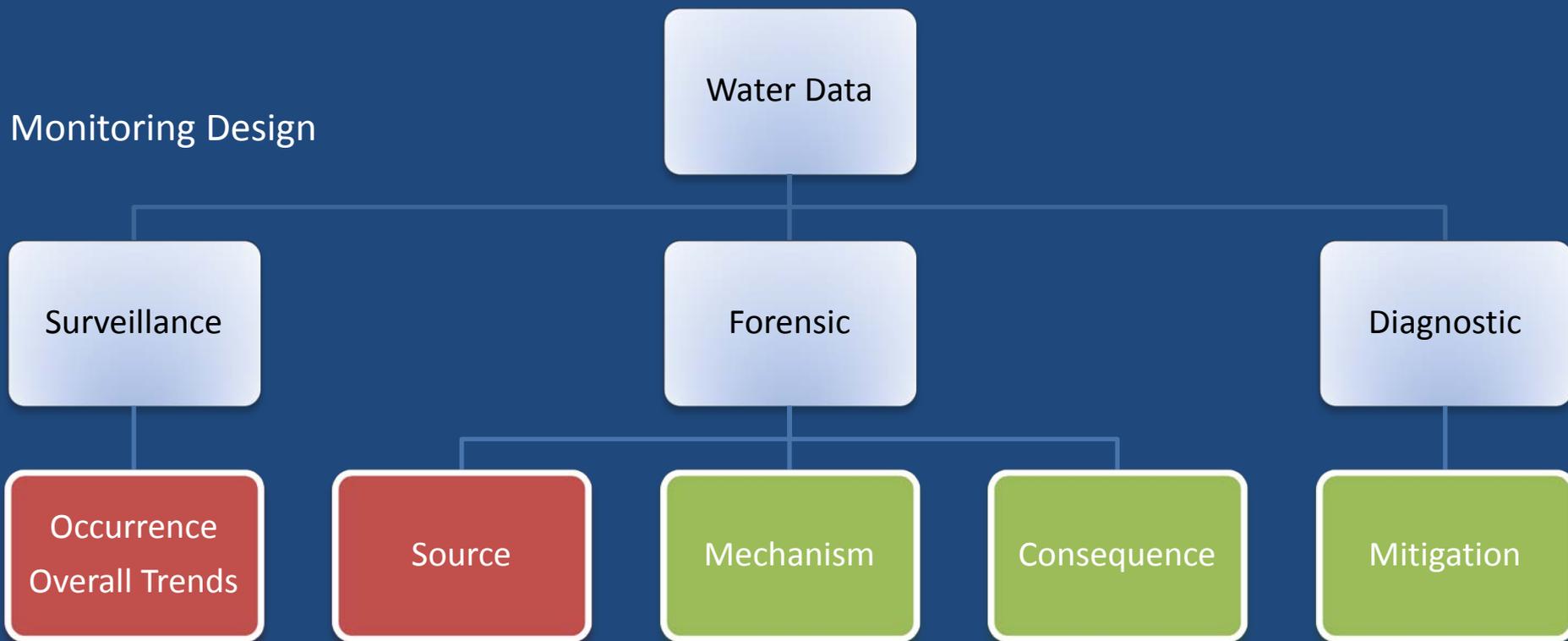
Nutrient TAC Members

Person	Organization
Anne Choquette	USGS
Paul Stacey	Great Bay National Estuarine Research Reserve in New Hampshire
Bill Brown	Pennsylvania DEP
Pete Richards	Heidelberg University
Mark Tomer	USDA Agricultural Research Service
Elizabeth Toot-Levy	Northeast Ohio Regional Sewer District

Shale Gas TAC Members

Person	Affiliation
John Wilson	USGS
Andrew Gavin	SRBC
Daniel Soeder	DOE National Energy Technology Lab
Pete Murdoch	USGS
Tony Shaw	PA DEP
James Saiers	Yale School of Forestry and Environmental Studies
Adam Goehner	Pembina
David Yoxheimer	Penn State University
Bert Smith	Chesapeake Energy

Water Data and Policy Questions



Types of Policy Questions

- = place based
- = may be transferrable

Data requirements for each type of study design

- Frequency of sampling
- Spatial distribution
- Period of record
- Constituents and methods
- Ancillary data
 - Context: flow, rainfall, temperature, etc.
 - Consequences: chlorophyll *a*, dissolved oxygen
 - Mitigation: date of implementation

TSWI Case Studies

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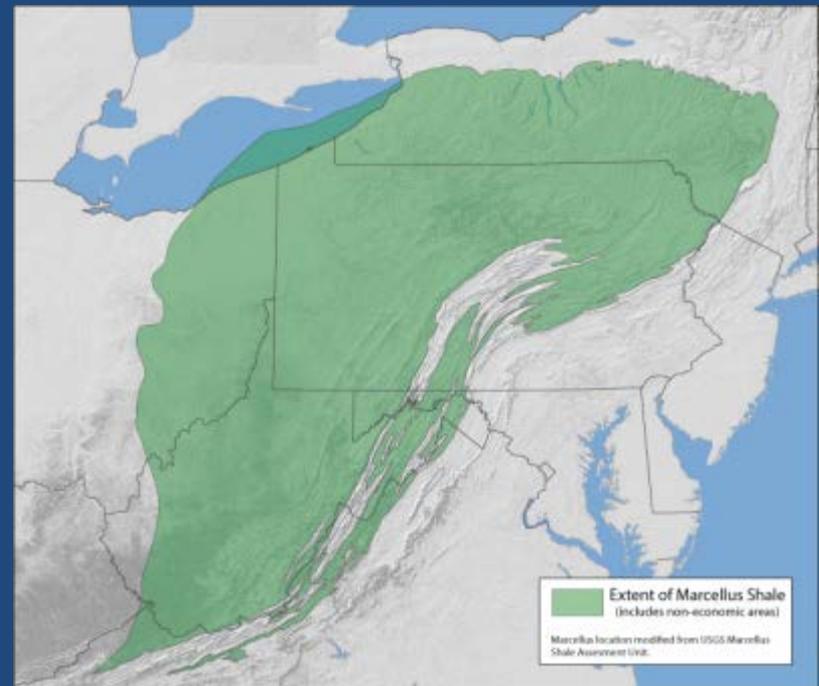
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Shale Gas Development Case Study

- **Policy Question:** Can Shale Gas Development or Hydraulic Fracturing contaminate ground water or surface water?
- **Geography:** The Susquehanna River Basin



Shale Gas Development Case Study (cont'd)

- Data Questions for Ground Water and Surface Water:
 - Are contaminants detected before or after Shale Gas development activities? What is the baseline prior to Shale Gas development activities? Do concentrations increase after development activities?
 - What indicators could be used to signal contamination is occurring in lieu of measuring all possible contaminants? Are those indicators detected? Do concentrations of these indicators increase after development activities?
 - Are monitoring programs capable of detecting contaminants from specific shale gas processes?

Shale Gas Development TAC Thoughts

- Shale Gas Development involves rapidly changing technology and techniques; how can a monitoring approach be flexible enough to adapt to rapid changes in the industry?
- Need good baseline water quality data in areas that are or will be experiencing shale energy development
- While geology tells us hydraulic fracturing is low risk to ground water, no real dedicated programs to monitor and verify over time; limited funding and access to drilling sites
- Effective targeted monitoring requires access to industry development activity data

Nutrient Case Study

- **Policy Question:** What policies are most effective at reducing nutrient loadings to reduce the risk of excessive algal blooms and hypoxic conditions?
- **Geography:** One of the following:
 - Lake Erie basin
 - Long Island Sound basin
 - Upper Mississippi basin
 - Lake Pepin watershed



Nutrient Case Study (cont'd)

- **Data Questions:**

- How have chlorophyll-a and nutrient concentrations changed over time? What is the baseline prior to development activities?
- What is the relative contribution of nutrient sources to nutrient related impacts? When and where are point sources or non-point sources the dominant contributor to nutrient concentrations?



Nutrient Enrichment TAC Thoughts

- Nutrients are not toxic contaminants with a clear threshold
- Achieving designated use is a universal endpoint, but the sources, mechanism, and consequences of nutrient enrichment are site specific
 - One size does not fit all when it comes to acceptable or “healthy” nutrient concentrations
 - Weight of evidence approach is appropriate
- Nutrients act in the context of a multi-stressor environment
- Uncertainty is inherent when trying to generalize policy from so many location specific circumstances

Next Steps

- Looking at National Water Quality Monitoring Network Design as a model for defining necessary science
- Working with data compiled by USGS
- Illustrating the role of water data and analysis in policy making