

Life Cycle Quality of EPA's Performance Measures

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Outline:

- Purpose
- Define performance measurement
- How are measures used in performance management
- Quality documentation
- Where OCFO needs help in applying the Quality System

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Why am I here today?

- Explain how OCFO oversees programs' use of environmental data
 - Data are used for performance measurement
 - Data are subject to the Agency's Quality System
 - Data are distinguished from Agency's financial data
- Seek assistance

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What is Performance Measurement?

- Ongoing monitoring and reporting of program's accomplishments (its activities, outputs, outcomes)
- Program performance is measured relative to a target

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How is Performance Measurement Used?

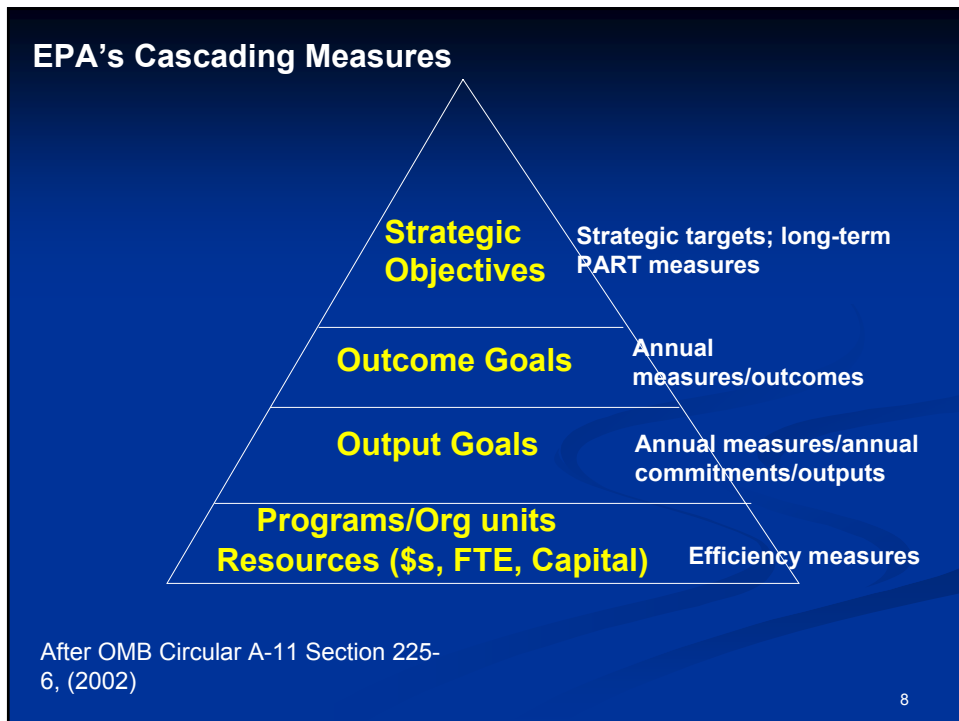
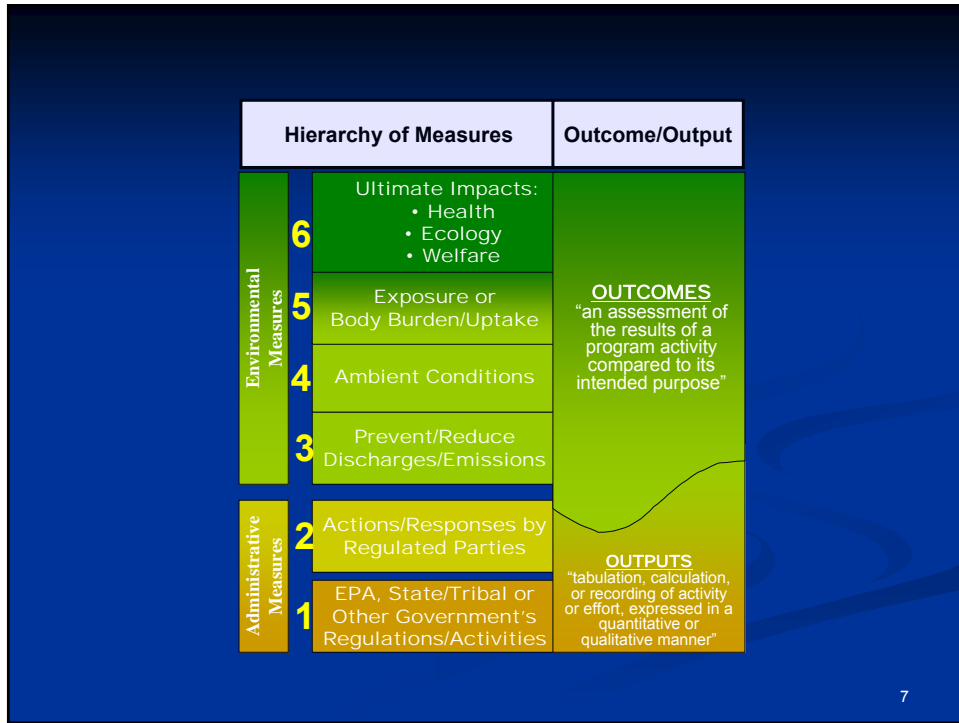
- Demonstrate progress toward goals/objectives
- Determine what level of performance is achieved by program
- Provide early warning to management
- Make management decisions on program funding and level-of-effort

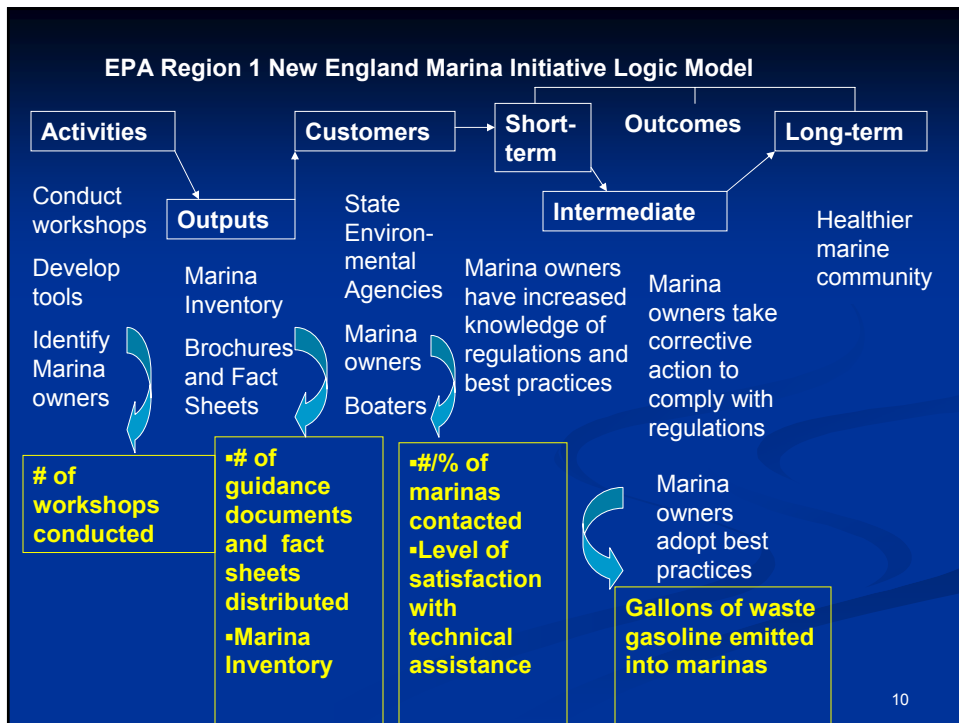
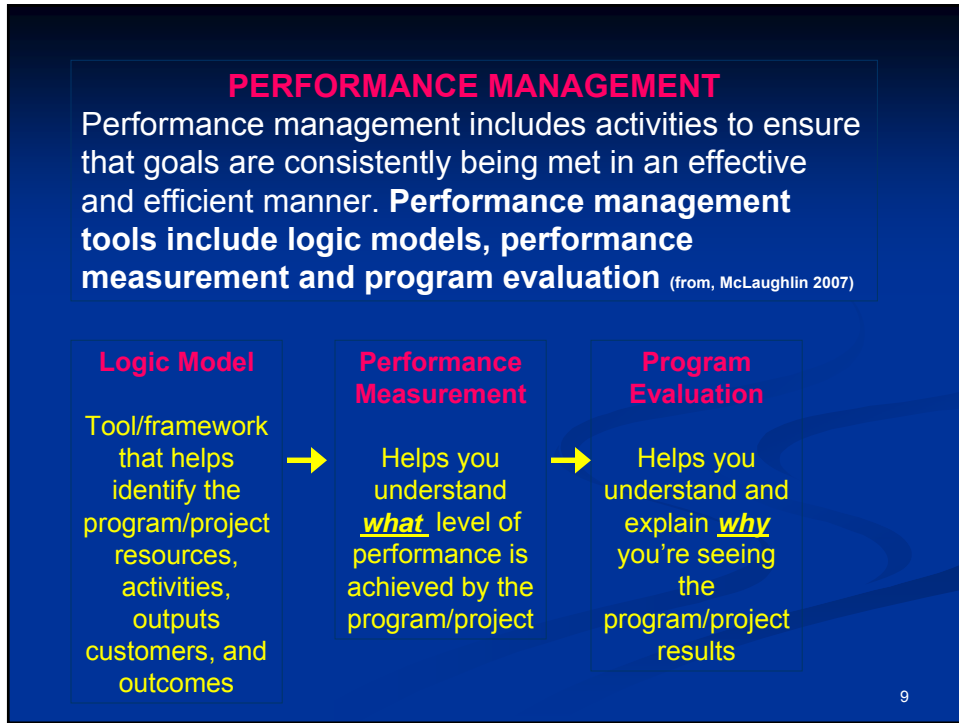
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Performance Management



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Criticisms of EPA's Performance Measures

- Difficult to attribute environmental results to program efforts
- Measures capture improvements, but what is optimum level?
- Measure language is too technical
- Many measures are administrative
- Poor alignment of measure and goal
- Measures not carried forward year-to-year

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EPA's Quality System for Environmental Data

- Applies to the collection, evaluation and use of environmental data
- Applies to existing data— the use of environmental data collected for another purpose or from another source
- The quality of scientific data must be assessed (known) and documented, regardless of its source

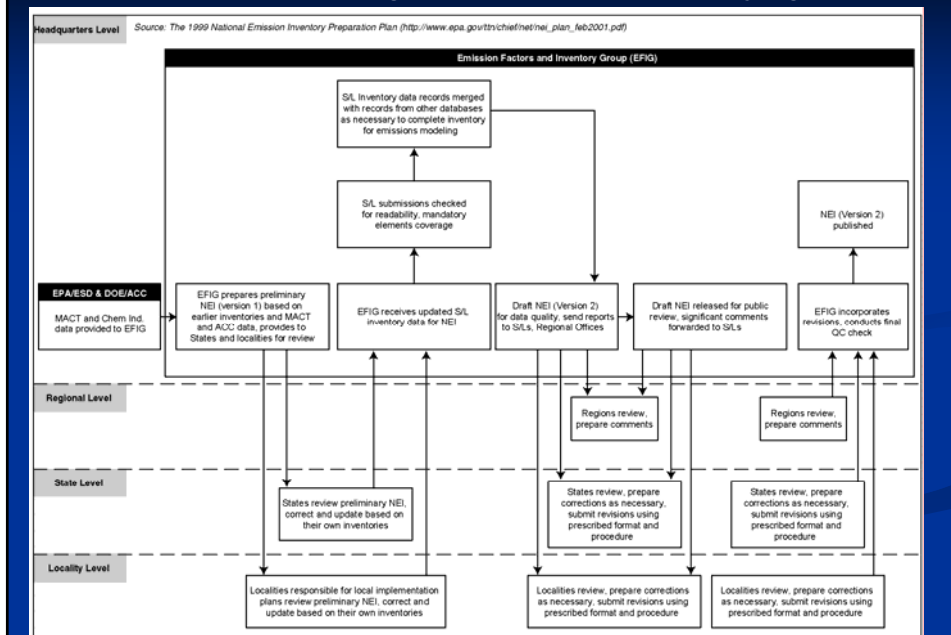
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Performance Measurement often relies on existing data:

- Data often administrative—frequency counts (e.g., Superfund sites)
- Data often heavily manipulated—ratcheted to national-level/regional-level
- Often units are percentages or cumulative totals

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National Emissions Inventory (NEI) – Conceptual map of data flows and sources, responsible organizations, and relevant quality regimes



How does OCFO document performance measurement quality?

- **Verification/Validation of Annual Measures**
 - + *Verification*- Accuracy and precision of measurement
 - + *Validation*- Is it the best measure of program performance?
- **OCFO's Information Quality Guidelines**
 - <http://intranet.epa.gov/ocfo/policies/iqg/index.htm>
 - + Predissemination Review Checklist
 - + OCFO's IQGs Compliance Form

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Limitations of OCFO's V+V

- Information too general for reproducibility of result
- Accuracy of information provided questionable
- Quality information on 3rd party data is limited
- No mechanism to follow-up on data problems
- Program Policy and QA staff do not collaborate
- Data quality should be part of planning but in reality is "after-the-fact"

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What's Needed

- Formal mechanism to standardize quality information for performance measurement, adhering to Agency and International standards
- Method of determining compliance with Quality System
- QA and Policy staff collaboration

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“The Road Ahead and Beyond”

- DA's vision for using Measures to manage programs and make decisions (1/07)
4 objectives: improve and align measures; strengthen data quality and system governance; increase access and use of data; reinforce reporting and accountability
- Defining Roles (11/9/07): “OEI will promote and ensure compliance with data quality standards policies and review program progress”

.....Executive hand in OCFO and OEI cooperation....

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Life Cycle Quality for Performance Measures – Sediment Remediation Examples

Pat Mundy
Environmental Scientist
US EPA/OEI
Quality Staff

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Illustrated by sediments case study

- Broad view of Quality System policies as applied to performance measurement

- Quality concerns
 - Policy applicability
 - Measures & supporting data congruence
 - Transparency/clarity of limitations/uncertainty
 - Completeness of documentation

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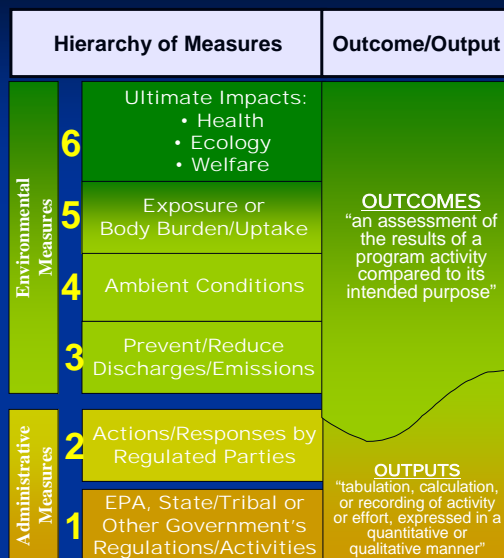
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Goal 4, Objective 3

- **Restore and Protect the Puget Sound Basin** By 2011, improve water quality, air quality, and minimize the adverse impacts of rapid development in the Puget Sound Basin
 - *By 2011, remediate 200 acres of prioritized contaminated sediments*
 - 3 others – lifting shellfish harvest restrictions, wetlands restoration and diesel emissions mitigation
- **Cubic yards of contaminated sediments remediated (cumulative since 1997) in the Great Lakes**

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Sediment Case Study “Players”

- OCFO budget process managers
- Superfund & OW/GLNPO budget implementation managers
- Puget Sound & Great Lakes sediment remedial program staff, grantees, contractors
- Region 10 & GLNPO data quality staff
- Superfund & GLNPO data base managers
- Superfund & GLNPO staff who report measures

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Quality System Guidance

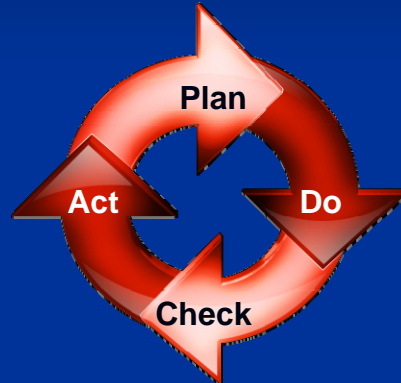
- Performance management (CFO)
 - 2007 Development Guide Part 2
 - Guidance for Verification & Validation
 - Pre-Dissemination review (IQGs)
- Info management & technology (CIO 2100)
 - Data standards & other data procedures
 - Life cycle procedures for IM/IT investments
- Env. quality programs manual & guidance

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Broad View of Quality System

- OMB Circular A-119 re consensus standards



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ASQ & ISO
quality
standards &
EPA 5360.1

- Proposed Quality Policy reinforces this for EPA

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Performance Measure Quality Cycle - Plan

- **Systematic planning**
 - Program staff
 - Stakeholders
 - IT/IM staff
 - QA & 2^o data experts
- **Measure selection**
 - Data search & criteria
 - Data storage decision
 - Documentation



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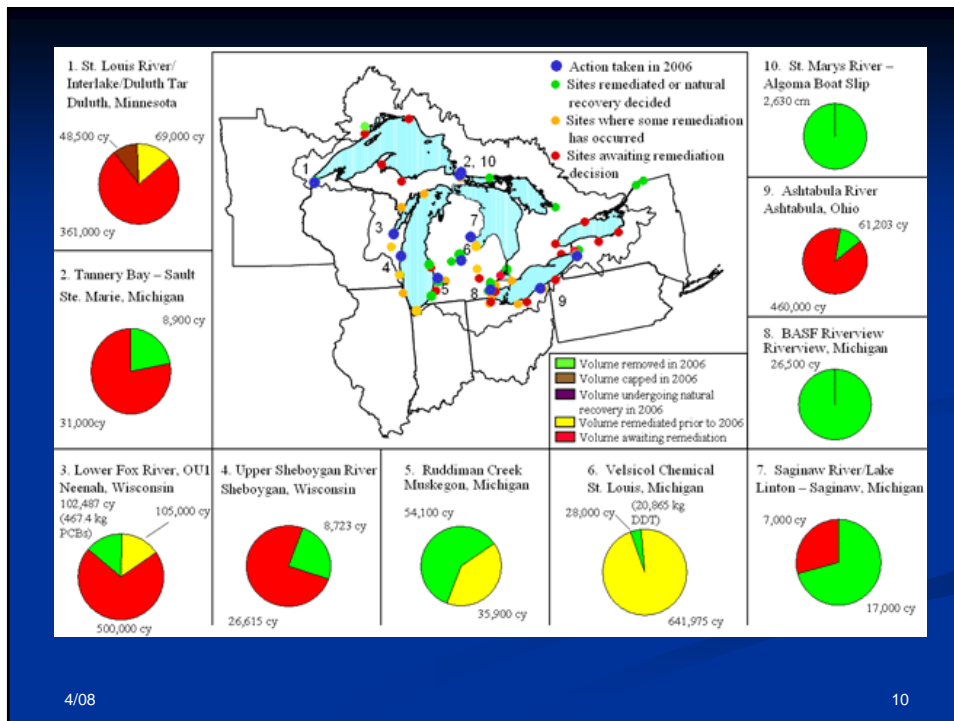
Performance Measure Quality Cycle - Do

- Implementation
 - Data collection
 - Calculate measurement value
- Suitability of measure and data (internal evaluation)
- Screen data for meeting criteria
- Quality oversight by measure owners



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Performance Measure Quality Cycle - Check

- IQG product pre-dissemination review
- External reviews
 - OMB PART
 - GAO program \$
 - OIG data base
 - QA env. data + data base?
- P-DR compliance statement & V+V documentation



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Performance Measure Quality Cycle - Act

- Iteration because
 - Strategic plan changes
 - Accountability
 - Progression to outcomes
- Measure revision because
 - Reality of data
 - Different measure
 - Better defined



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Completing Life Cycle Management



- Achieve objective, measure
- Retire data base
- Determine archive/record needs

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Quality Concerns

- Policy applicability questions
- Congruity between measure and supporting data
- Completeness of referenced documentation
- Transparency/clarity of limitations/uncertainty

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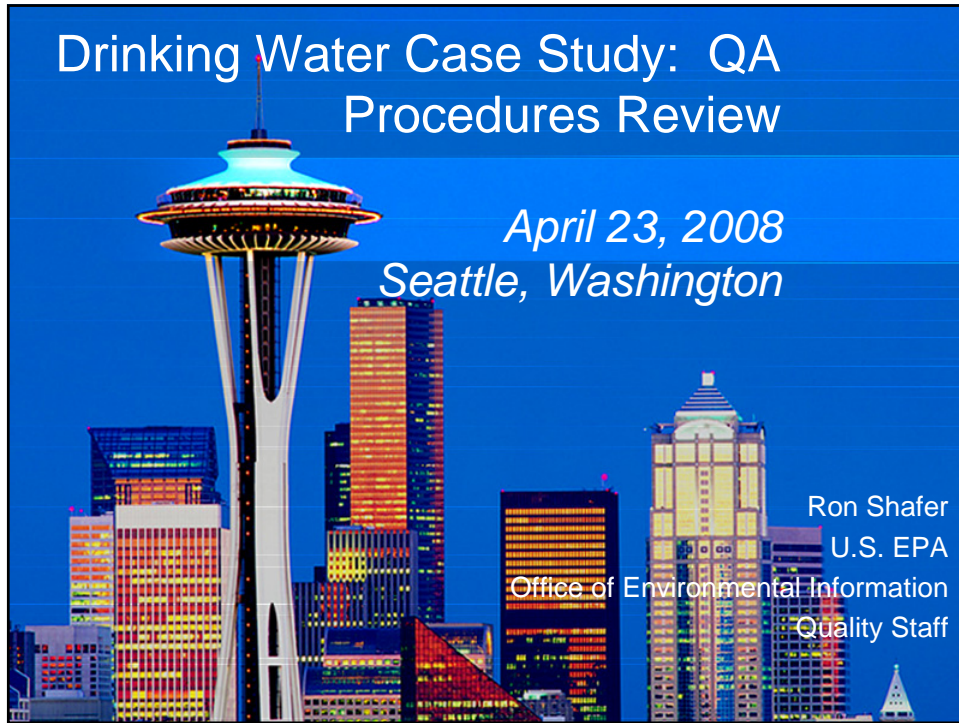
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Getting Results – Filling Gaps

- Σ Increase involvement and communication
 - Σ Program office managers
 - Σ Quality experts
 - Σ IT/IM managers
 - Σ Technical experts
- Σ Expand guidance linking measures and data
- Σ Collect “good” examples of documentation
- Σ Provide technical assistance, training & tools – checklists, generic plans or QAPPs

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Drinking Water Case Study: QA Procedures Review

*April 23, 2008
Seattle, Washington*

Ron Shafer
U.S. EPA
Office of Environmental Information
Quality Staff


Agenda

- Case study goals
- Case study methodology
- Selected performance measure
- Initial review of data sources and QA processes
- Initial review of QA process for performance measure reporting
- Next steps

9 May 2008

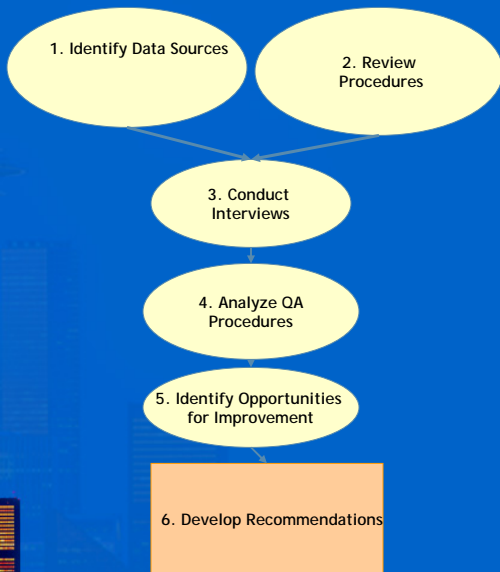
Goals of Case Study

- Use drinking water performance measures to illustrate how data are collected and used for EPA performance measures
- Identify potential improvements for data quality planning and procedures used in performance measurement reporting
- Provide recommendations for possible guidance under existing quality order



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Methodology for Case Study



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graph TD; A(1. Identify Data Sources) --> C(3. Conduct Interviews); B(2. Review Procedures) --> C; C --> D(4. Analyze QA Procedures); D --> E(5. Identify Opportunities for Improvement); E --> F[6. Develop Recommendations];
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9 May 2008

Selected Drinking Water Performance Measure

- Goal 2: Clean and safe water
 - Objective 2.1: Protect human health by reducing exposure to contaminants in drinking water (including protecting source waters), in fish and shellfish, and in recreational waters
 - Sub-Objective 2.1.1: By 2011, 91% of the population served by community water systems will receive drinking water that meets all applicable health-based drinking water standards through effective treatment and source water protection.
 - Drinking Water FY 2009 Performance Measure: 89% of the population served by community water systems will meet all applicable health-based drinking water standards through approaches including effective treatment and source water protection



Data Source

- Safe Drinking Water Information System - Federal Version (SDWIS/FED).
 - SDWIS/FED contains basic water system information, population served, and detailed records of violations
 - SDWIS/FED has provided annual results for ten years and reports on a fiscal year basis
 - Regulated water systems provide the initial source of data
 - Regulatory agencies with primary enforcement authority for the Public Water System Supervision program collect the data from the regulated water systems



Data Flow to SDWIS/FED

- Public Water Systems
 - Water Samples
 - Samples to Lab
- Certified Labs
 - Sampling Results
- States
 - Report Violations
- EPA HQ SDWIS/FED
 - National Priorities
 - Public Information
- EPA Regions
 - Oversight



QA Procedures for SDWIS/FED

- Community Water Systems follow requirements of 40CFR141
- Labs must be certified
- States covered by EPA grant QA requirements
- EPA conducts data verifications (on-site audits) of primacy state and tribal drinking water programs



QA Procedures for Reporting

- V &V process
 - Data Sources
 - QA procedures
 - Methods
 - Data Quality Review
 - Limitations
 - Error Estimates
- Potential Issues
 - Difficulty of reporting compliance statistics using violation data
 - Planning and Data Reviews
 - Transparency



Challenges

- March 5, 2004 IG Report – EPA Claims to Meet Drinking Water Goals Despite Persistent Data Quality Shortcomings
 - Accuracy and Completeness of SDWIS/FED Data
 - Issue Never Fully Addressed by OW
- September 21, 2006 IG Report – Promising Techniques Identified to Improve Drinking Water Laboratory Integrity
 - Potential Impact of Poor Data Quality on Human Health
 - Oversight and Policy



Opportunities

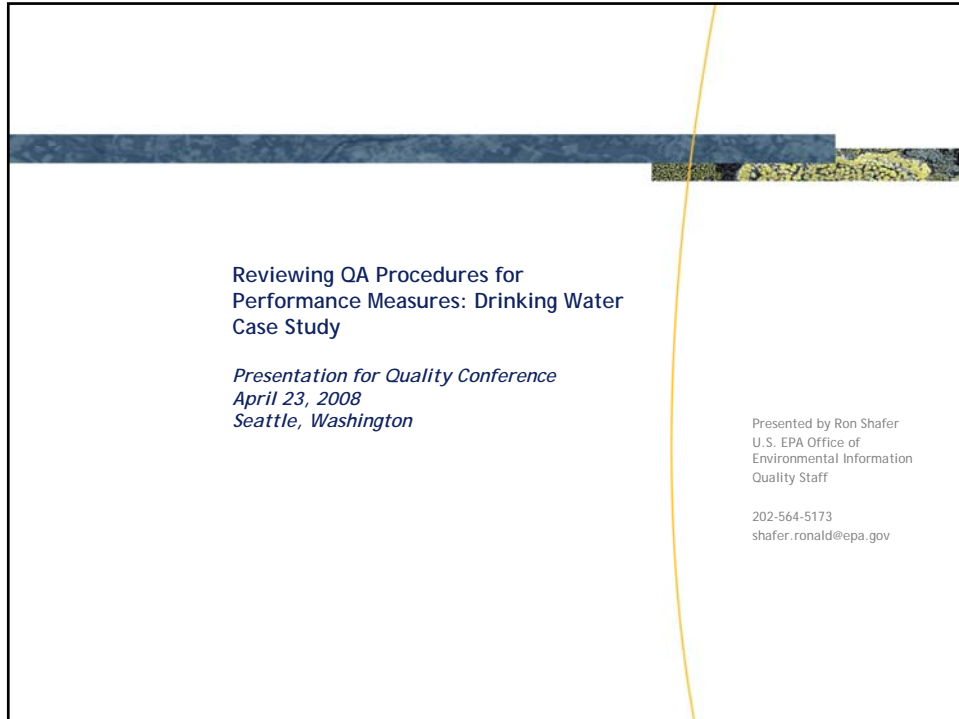
- Performance Measure Development and Reporting
 - Data Collection and Analyses
 - QA Plans
 - Audits and Corrective Actions
 - Lab SOPs
 - Measure Reporting
 - V&V: QA Procedures, Quality Review, Error Estimate and Limitations
 - Potential Benefit to the Process:
 - Clarify that Performance Measurement Reporting is covered by QS
 - Planning Documentation
 - Data Quality Reviews and Documentation



Next Steps

- Identify areas where more information is needed
- Identify potential interviewees
- Conduct interviews
- Analyze existing QA procedures
- Develop recommendations



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**Reviewing QA Procedures for
Performance Measures: Drinking Water
Case Study**

*Presentation for Quality Conference
April 23, 2008
Seattle, Washington*

Presented by Ron Shafer
U.S. EPA Office of
Environmental Information
Quality Staff

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shafer.ronald@epa.gov

Cover by Presentation

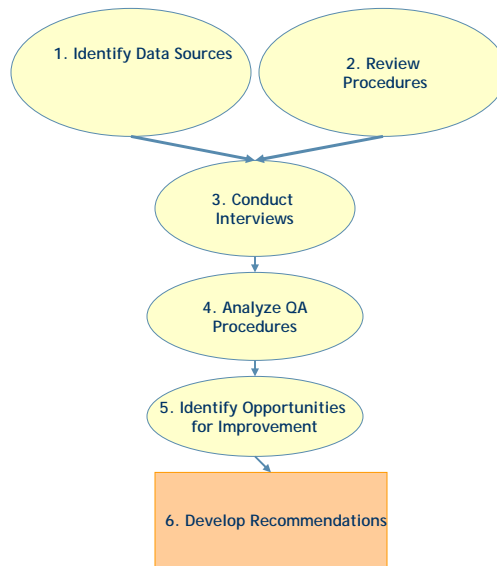
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Opportunity for Continual Improvement

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