



Assessing the Quality of Alabama's Surface Waters – Making Science-based Decisions

**Nonpoint Source
Conference**

January 22, 2014

- **Terminology**
- **Assessment Methodology**
- **Assessment Process**
- **Data ≠ Data ≠ Data ???**
- **Integrated Water Quality Report**
- **Simple Example**
- **Summary**



- **Assessment – A determination of the current status or condition**
- **Water Quality Standards – The benchmark for determining use support and protecting water resources**
- **Science-based Decision – An evaluation of available information to reach a conclusion**

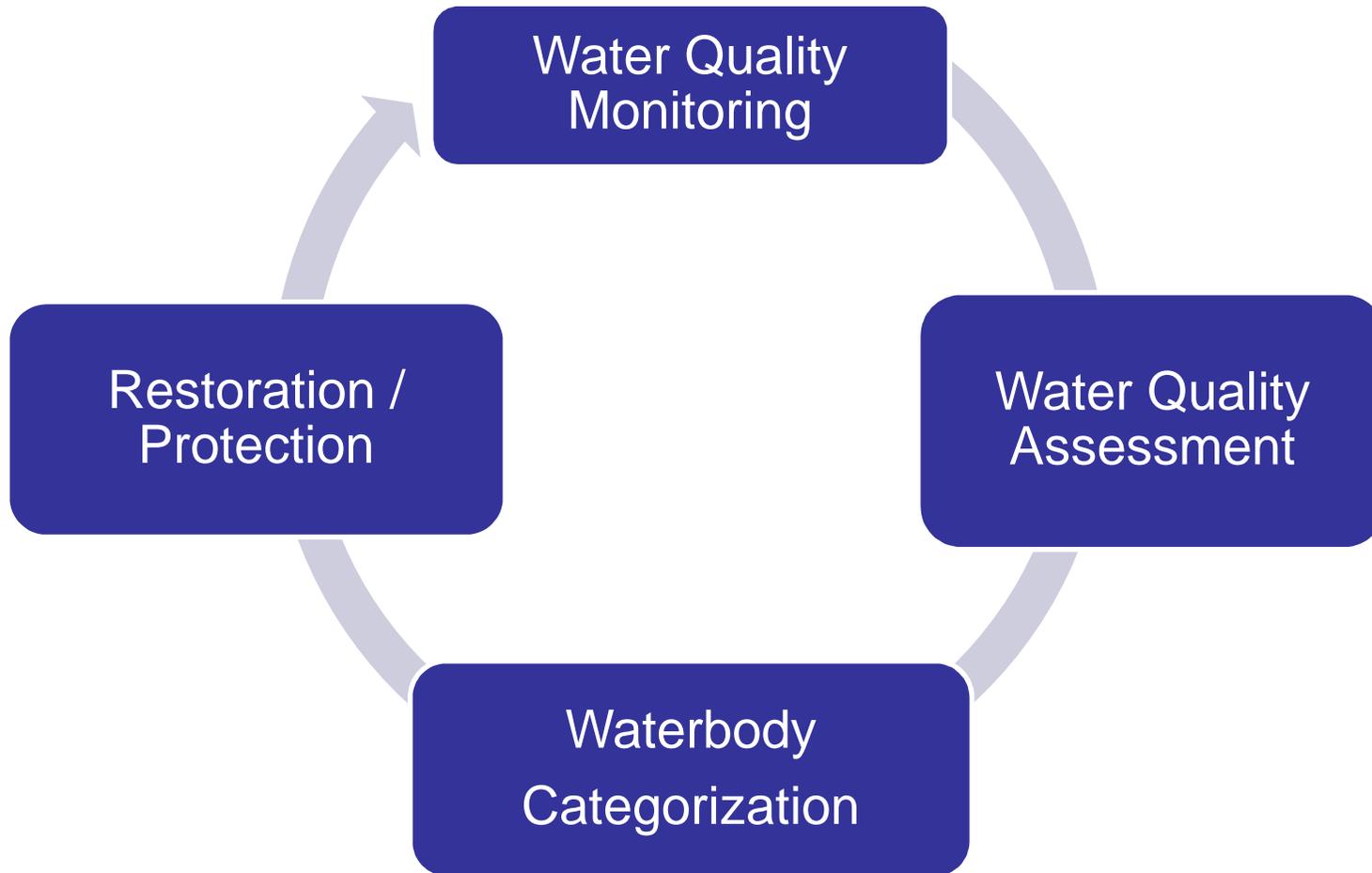
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ADEM's Water Quality Assessment Methodology

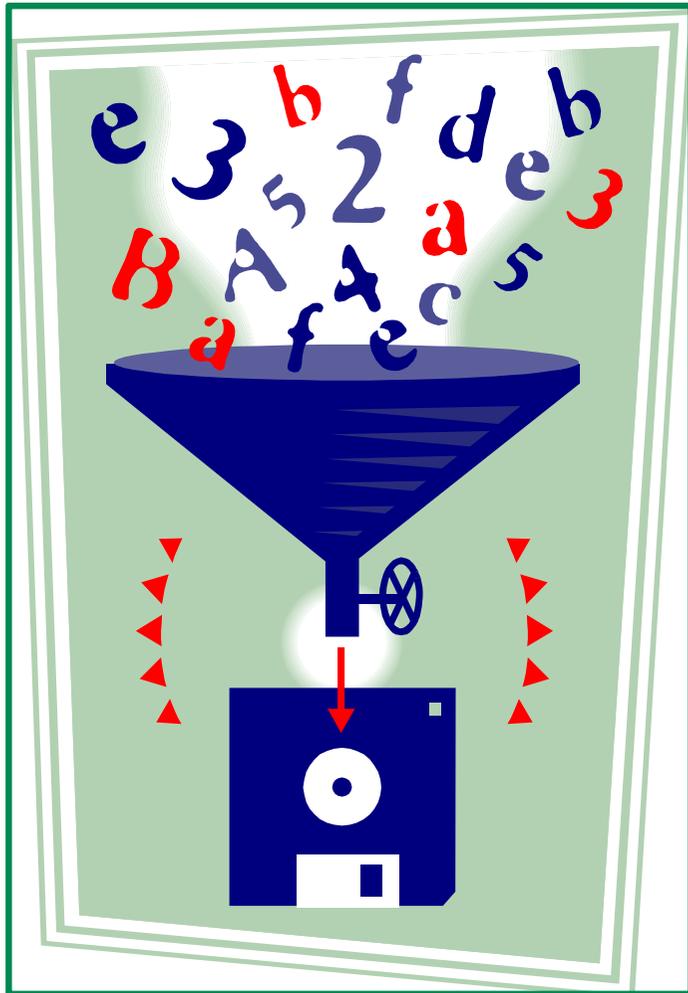
- **A detailed description of how the status of surface water quality is determined**
 - **Types and sources of data**
 - **Minimum data requirements**
 - **Temporal and spatial considerations**
 - **QA / QC considerations**
- **Categorization of surface waters based on assessment results**

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The Assessment Cycle



ADEM The Assessment Process



Finalize the assessment methodology

Compile available data and information

Compare data to minimum data and QA/QC requirements

Compare water quality data to numeric criteria

Evaluate biological assessment results (if available)

Assign waterbody to the appropriate Category

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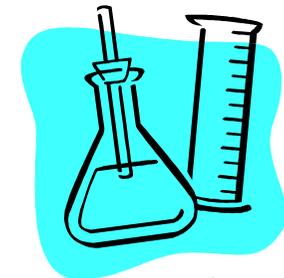
Data, Data, Data

- **Chemical, physical, biological, habitat**
- **Photographs**
- **Site visits**
- **Land use patterns**
- **Historical measurements**
- **Station visit comments**
- **Multiple sources of information**
- **Data quality considerations**
- **Best professional judgment**



- **In Situ Measurements**
 - Dissolved Oxygen
 - pH
 - Temperature
 - Turbidity
 - Conductivity or Salinity
 - Flow
- **Biology**
 - Macroinvertebrate
 - Fish
 - Habitat
 - Periphyton

- **Laboratory Measurements**
 - Solids
 - TDS
 - TSS
 - Biochemical Oxygen Demand
 - Nutrients
 - Ammonia
 - TKN
 - NO₂+NO₃-N
 - Metals
 - Chlorophyll *a*
 - Bacteria



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Data Sources

- **ADEM**
- **ADPH**
- **GSA**
- **USGS**
- **TVA**
- **AWW**
- **Other states (MS, GA, FL, TN)**
- **Universities**



- **Categories = Water Quality Filing System**
 - **Category 1 = Fully Supporting Uses**
 - **Category 2A = Status Unknown – potential for impairment (limited information)**
 - **Category 2B = Status Unknown – impairment unlikely (limited information)**
 - **Category 3 = Status Unknown – no information available**



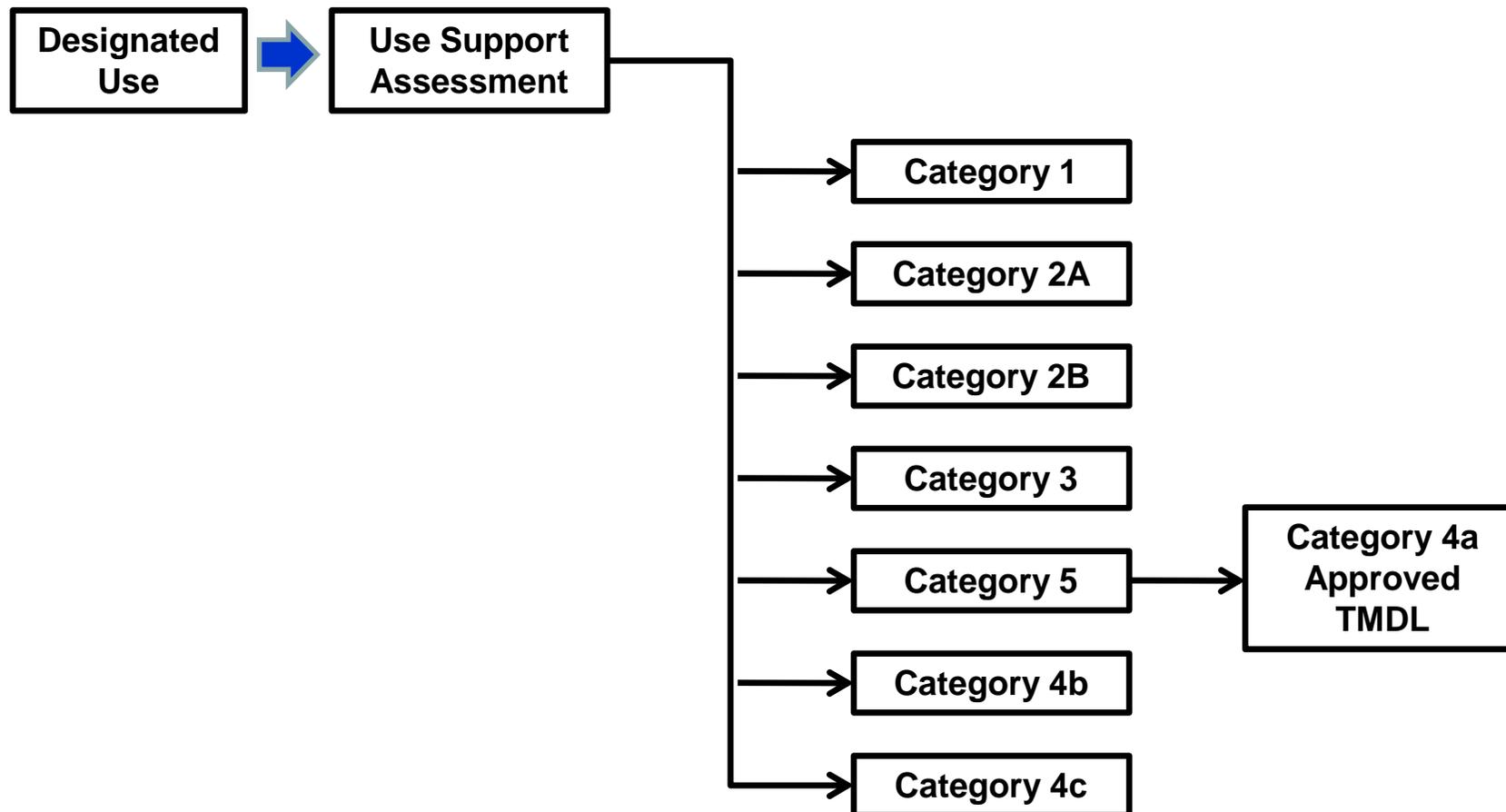


Categories - continued

- **Category 4A** – Impaired water quality – All TMDLs have been completed
- **Category 4B** – Impaired water quality – corrective actions underway – TMDL not needed
- **Category 4C** – Impaired water quality – impairment not caused by pollutant(s) – TMDL not needed
- **Category 5** – Impaired water quality – TMDL pending (303d List)

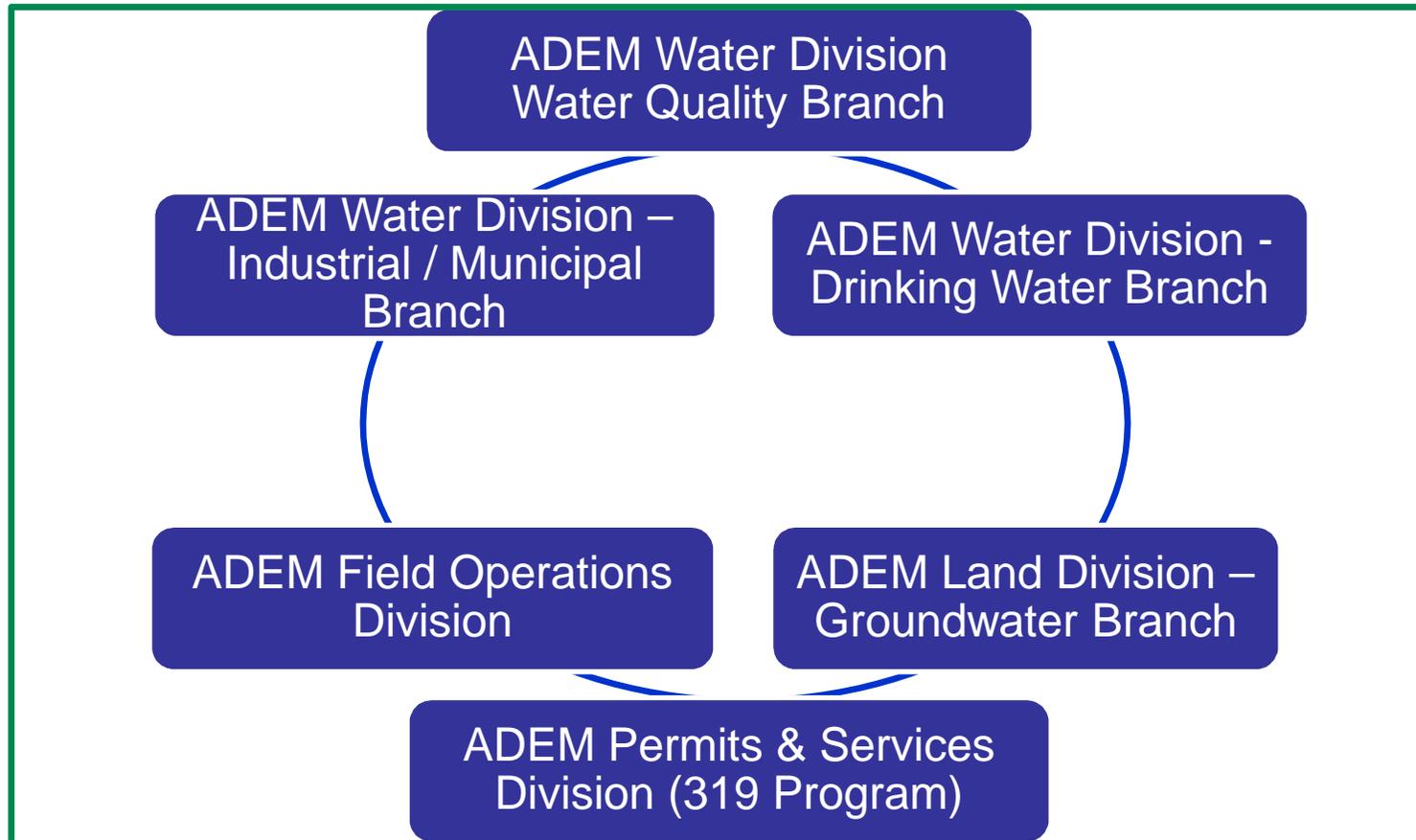
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Data to Category



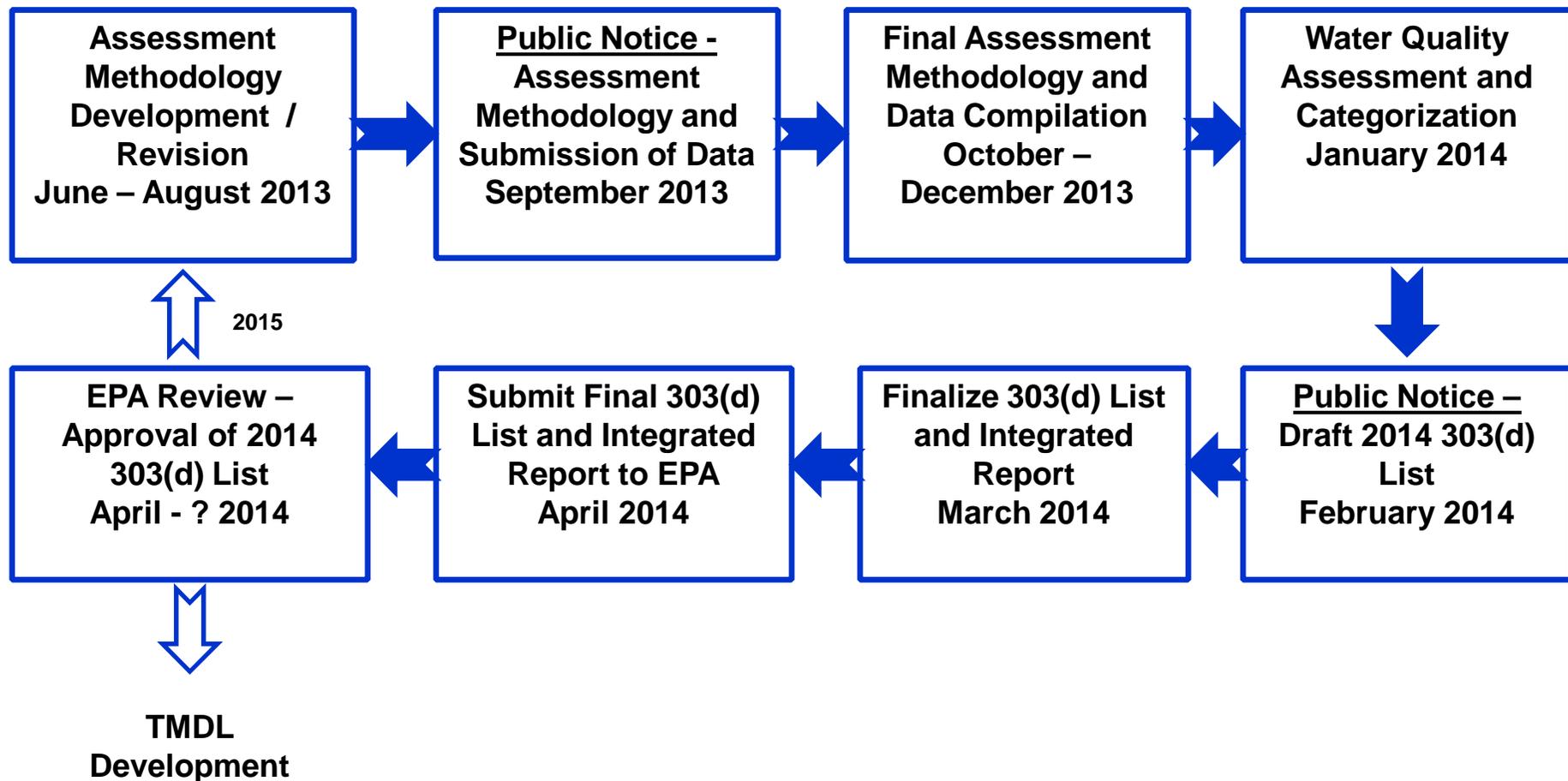
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Program Coordination



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Assessment Timeline





Results – Now What?

- **Integrated Water Quality Monitoring and Assessment Report**
 - Completed every two years
 - Categorization of waters
 - Includes 303(d) List with TMDL schedule
 - Summary of ADEM's water quality monitoring activities and protection / restoration programs
- **TMDL Development**
 - Next step in the restoration process
- **Delisting Decisions**
 - Demonstration of water quality improvement



Integrated Water Quality Monitoring and Assessment Report

- **CWA §305(b) Water Quality Report to Congress**
- **Submitted Every Two Years**
- **Statewide Summary Report**
 - River and Streams
 - Lakes and Reservoirs
 - Wetlands
 - Ground Water
 - Coastal Waters
 - Nonpoint Source Management
 - Public Health
 - TMDL Program

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A “Simple” Example

- **Assessment of Bacteria Data – F&W Use**

Date	E. Coli Colonies/100 ml
09/05/2013	613.1
09/06/2013	172.3
09/07/2013	62.7
09/08/2013	55.6
09/09/2013	56.3
Geometric mean	115.7



Single
Sample
Exceedance

Non-Coastal Waters:

Single sample ≤ 487 colonies/100 ml E. coli (June – September)

Single sample $\leq 2,507$ colonies/100 ml E. coli (October – May)

Geometric mean E. coli density ≤ 126 colonies/100 ml (June – September)

Geometric mean E. coli density ≤ 548 colonies/100 ml (October – May)

- **Water quality assessment involves a thorough evaluation of available data**
- **Assessment methodology guides the categorization of assessed waters and must account for data quality**
- **Results are reported in the biennial Integrated Water Quality Monitoring and Assessment Report**



Conclusion

- **For questions about the assessment process or reporting, contact:**

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