

**Upper Rappahannock
River Basin
Total Maximum Daily
Load Study**

Public Meeting

Meeting Agenda

- Water Quality Assessments and TMDL Process
Katie Conaway, VA DEQ
- Overview of Rappahannock 16 TMDL
Katie Conaway, VA DEQ
- Bacteria TMDL Source Assessment
Byron Petrauskas, Engineering Concepts, Inc.
- Questions

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Why are we here?

Purpose of the Project:
To develop Total Maximum Daily Loads (TMDLs) for 16 bacteria impaired stream segments in the Upper Rappahannock River Basin.

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Getting Started

- Monitor and assess water quality of Virginia's navigable waters.
- Prepare the Water Quality Integrated Assessment Report 305(b) Report and 303(d) List.
- Perform a Total Maximum Daily Load Study on any stream segment listed as Impaired on the 303(d) List.



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Water Quality Standards

- Waters are listed as impaired based on Water Quality Standards (WQS).
- Water Quality Standards:
 - Regulations based on federal and state law
 - Consist of designated use(s) and water quality criteria to protect the designated uses.
 - Set numeric and narrative limits on pollutants.

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Designated Uses

- Recreational
- Aquatic Life
- Public Water Supply
- Wildlife
- Fish Consumption
- Shellfish



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Fecal Coliform Bacteria and E. coli Bacteria

- For primary contact recreation use, waters are assessed using fecal coliform and *E. coli* bacteria measurements*.



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Fecal bacteria:

- Found in the digestive tract of humans and warm blooded animals.
- Indicator of the potential presence of pathogens in waterbodies.

E. coli:

- subset of fecal coliform bacteria.
- correlate better with swimming-associated illness.

* In order for a waterbody to be listed as impaired:
 - There must be at least two samples that exceed the water quality criterion.
 - Greater than 10.5% of the total samples must be exceedances.

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Three Step TMDL Process in Virginia

1. TMDL Development - find the source of the pollutant & determine the reduction needed.
2. Implementation Plan Development - identify conservation measures to fix the problem. Conservation measures are often called Best Management Practices or BMPs.
3. Implement the BMPs and sample to see improvement.

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What is a TMDL ? *Total Maximum Daily Load*

A TMDL is a **pollution budget**:

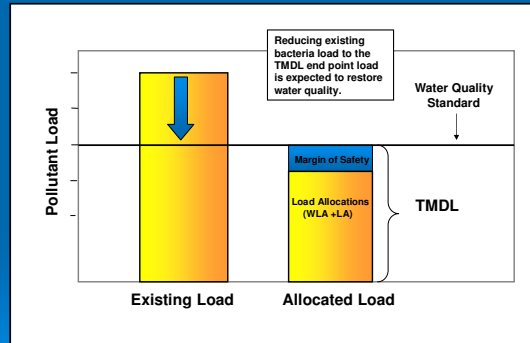
$$\text{TMDL} = \text{Sum of WLA} + \text{Sum of LA} + \text{MOS}$$

Where:

- TMDL = Total Maximum Daily Load
- WLA = Waste Load Allocation (point sources)
- LA = Load Allocation (nonpoint sources)
- MOS = Margin of Safety

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An Example TMDL



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Required Elements of a TMDL

A TMDL must:

- Be developed to meet Water Quality Standards.
- Be developed for critical stream conditions.
- Consider seasonal variations.
- Consider impacts of background contributions.
- Include wasteload and load allocations (WLA, LA).
- Include a margin of safety (MOS).
- Be subject to public participation.
- Provide reasonable assurance of implementation.

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TMDL Development Methodology

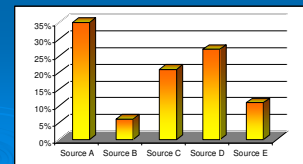
1. Identify all types of sources of a given pollutant within the watershed.



2. Calculate the amount of pollutant entering the stream from each source type.

3. Calculate the pollutant reductions needed, by source, to attain Water Quality Standards.

4. Allocate the allowable loading to each source and include a margin of safety.



How a TMDL Project is Managed

- DEQ is the Project Lead for the TMDL Development Phase (DCR provides assistance).
- DEQ subcontracts out the modeling and technical work involved in TMDL Development
- Stakeholder and public participation:
 - Other VA Agencies, Local Governments, Community Groups, etc. are invited to participate in Technical Advisory Committee meetings.
 - The general public and interested stakeholders are invited to public information meetings.
- Once the study has been approved by the State Water Control Board, the Implementation Plan process is begun.
- DCR is the lead for Implementation Plan Development (DEQ provides assistance).

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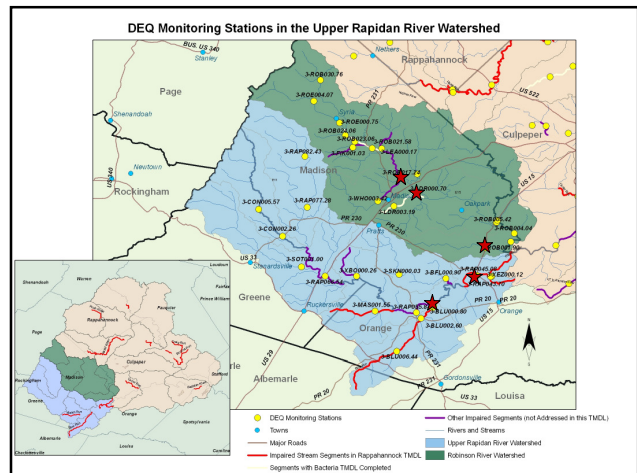
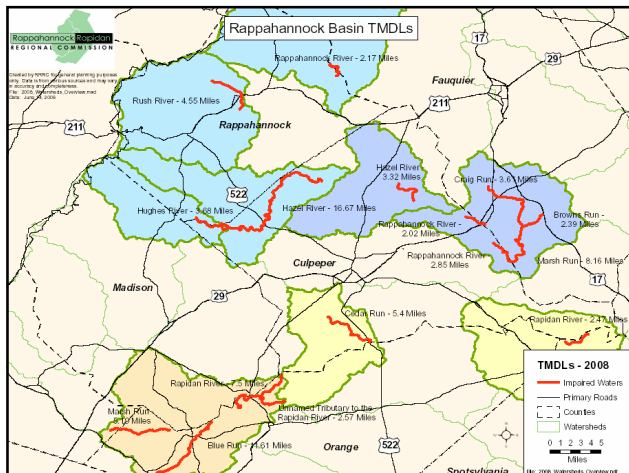
Upper Rappahannock TMDL Study

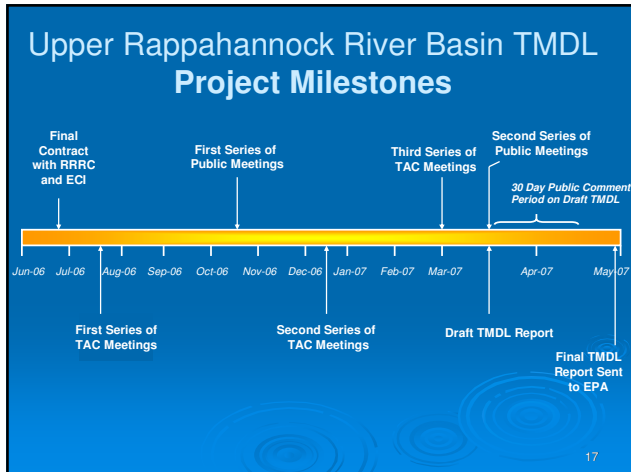
- 16 segments in Rappahannock River Basin.
- Covers portions of 8 Counties (Albermarle, Culpeper, Fauquier, Greene, Madison, Orange, Rappahannock, and Spotsylvania).
- Two TACs:
 - Upper Rappahannock Watershed
 - Rapidan Watershed



***A complete list of the impaired segments addressed by this TMDL can be found attached to the end of this presentation (Light Blue Handout).

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