Watershed Planning and Protection for Lake Lavon

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Presentation Outline

- NTMWD Watershed Management Program Development

- The Lake Lavon Watershed

- The Lake Lavon Watershed Protection Plan

- Improving the SELECT Model through the Lake Lavon WPP

NTMWD Systems

Water

- 370 MGD average raw water supply
- 6 water treatment plants – 806+ MGD capacity
- 566 miles of transmission pipelines
- 9 raw water pump stations
- 8 treated water pump stations
- 77 City delivery points

Wastewater

- Operate 17 wastewater treatment plants
- (11 owned by NTMWD, including 4 regional plants)
- 151+ MGD treatment capacity
- 8 interceptor systems with 250+ miles of large-diameter pipelines and 23 lift stations

Solid Waste

- 3 transfer stations, 3,295 combined permitted tons/day
- 800,000+ tons/year accepted at landfill
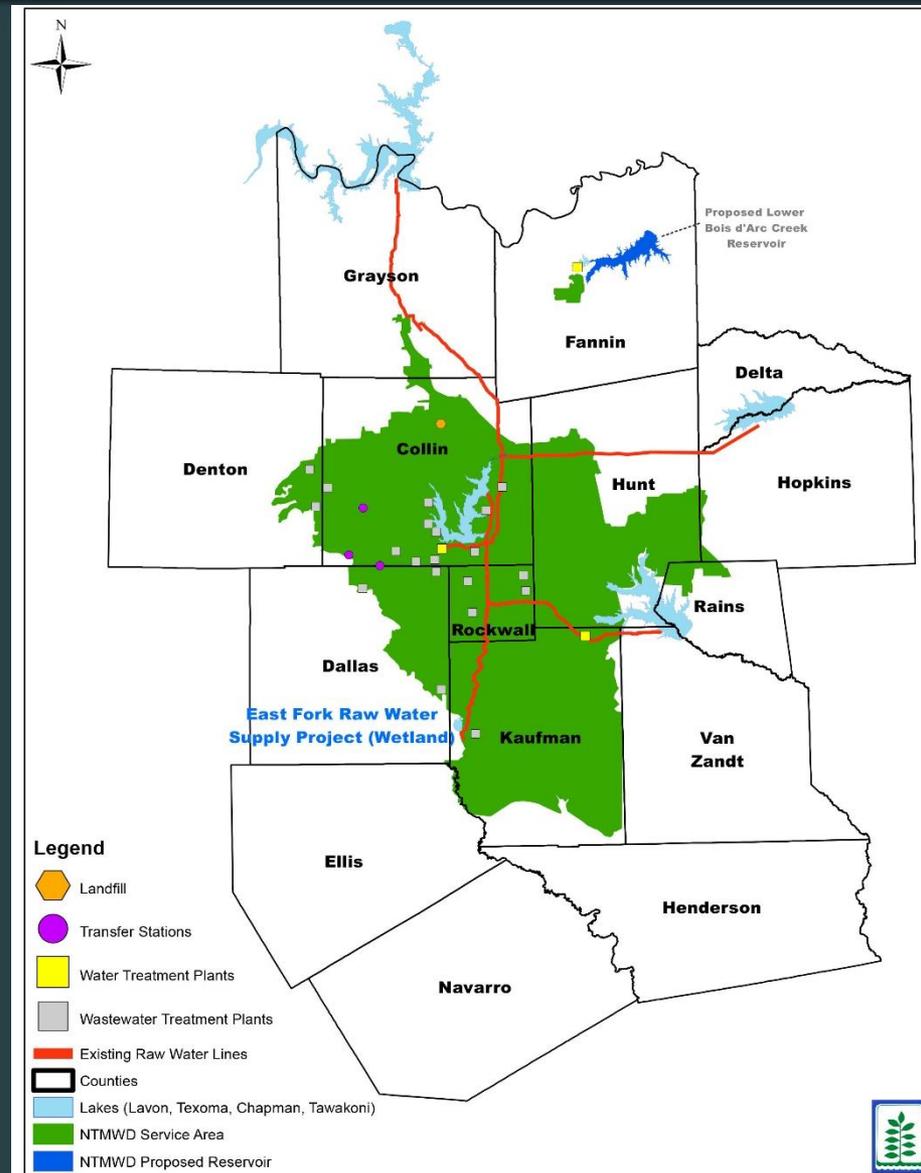
NTMWD Watershed Management

- Identified as a need in 2011

- Approval by Executive Management to proceed in 2015

  - Budget created and approved

  - WPP included in NTMWD Strategic Plan

- Network with peer Watershed Management units and professional organizations

- Learn about available resources

- Explore Partnership Opportunities (AgriLife, Stream Team)

- Publicize our intentions to *everyone*

- Watershed Manager position filled January 2016

TOTAL WATER RESOURCE MANAGEMENT

- **We all live in a watershed**

- **Watershed Management embraces concept of "One Water"**

- **Storm run-off and treated wastewater returns to streams & lakes**

- **Becomes part of sources of supply**

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Lake Lavon

- Built in 1953 by U.S. Army Corps of Engineers and supports:

    - Municipal Water Supply for 1.6 million people
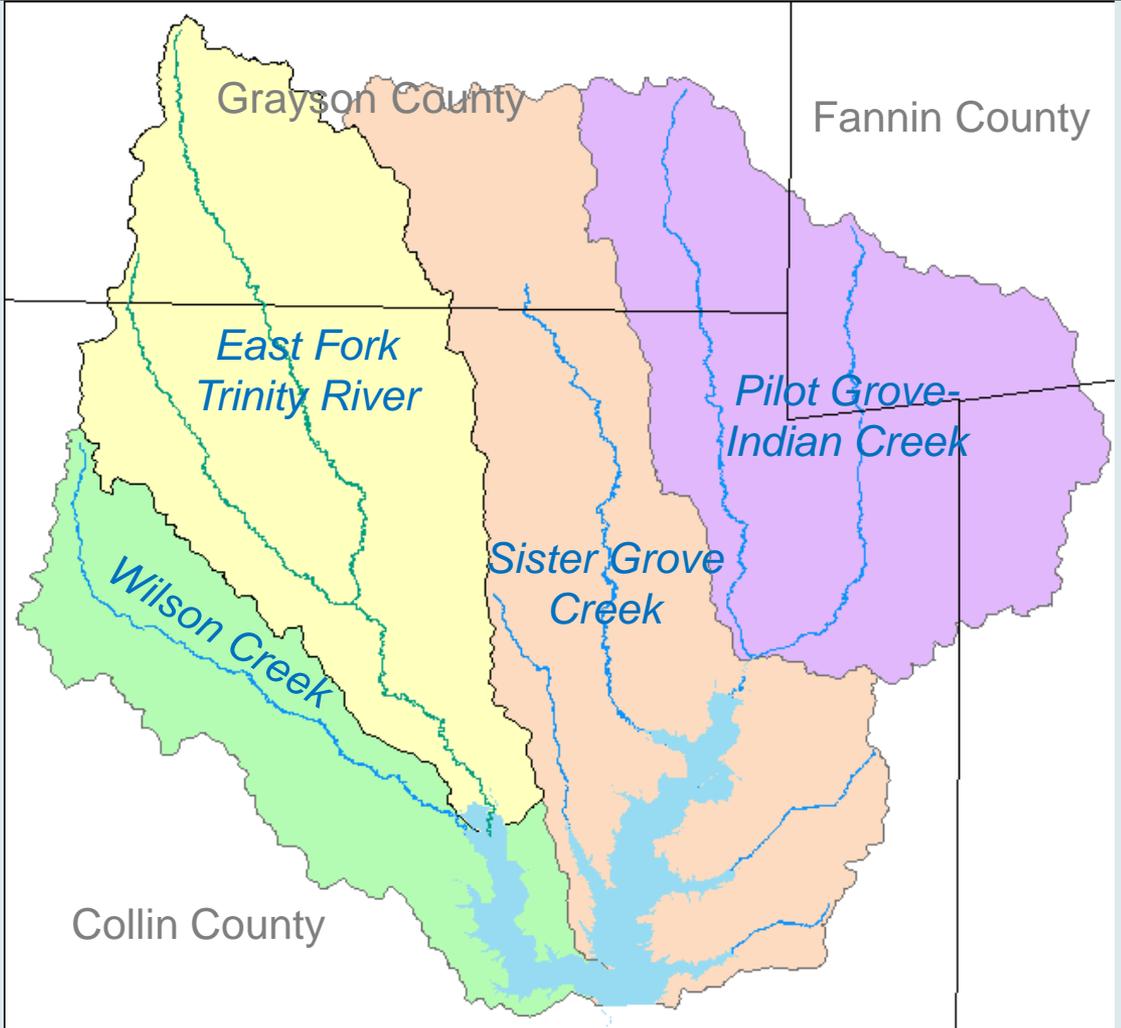
    - Flood Control

    - Recreation

Major River Basins of Texas

LAKE LAVON WATERSHED

Grayson County

Fannin County

East Fork
Trinity River
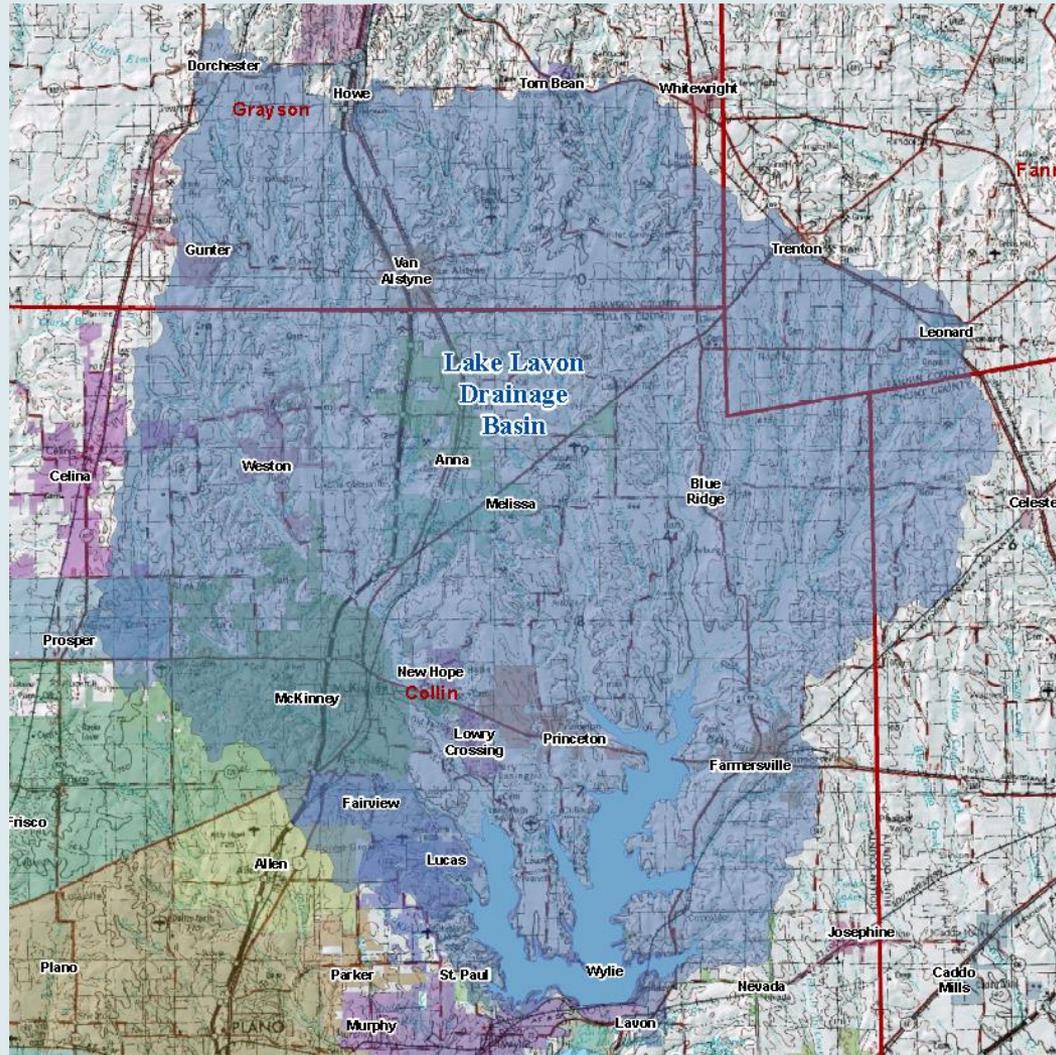
Pilot Grove-
Indian Creek

Sister Grove
Creek

Wilson Creek

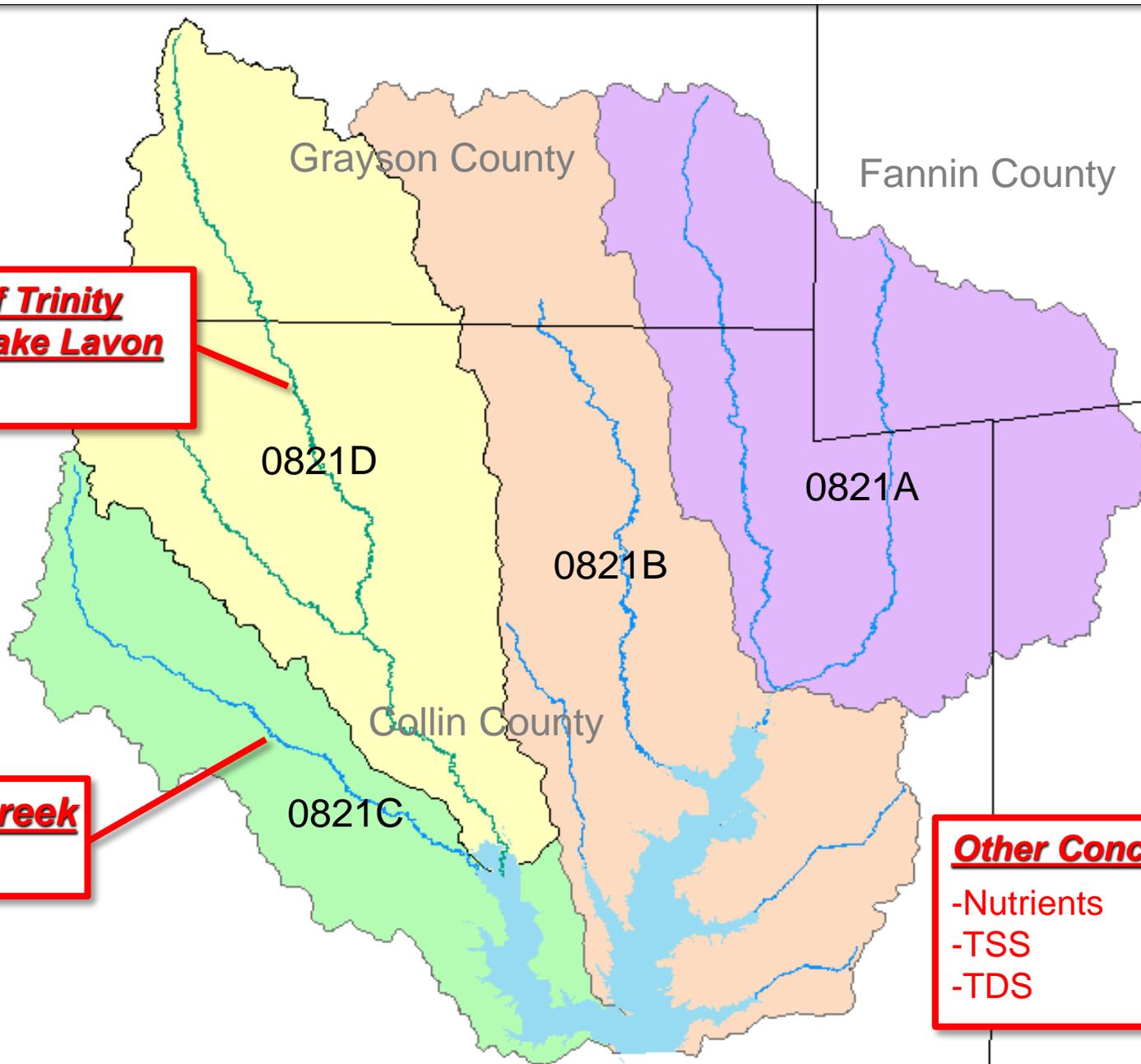Collin County

TRINITY RIVER BASIN

THE LAKE LAVON WATERSHED

- The Lake Lavon watershed drains an area of about **768 mi²** or **198,981** acres

- The watershed includes parts of Collin, Grayson, Fannin, and Hunt Counties.
- Lake Lavon is the uppermost reservoir on the East Fork of the Trinity River.

- *Largest population centers are NTMWD Member and Customer Cities:*
  - McKinney: 131,117
  - Frisco: 116,989
  - Allen: 84,246
  - Prosper: 9,423
  - Anna: 8,249

What impairments are found in the Lake Lavon Watershed?

Watershed Impairments & Concerns

East Fork of Trinity River abv Lake Lavon

-Bacteria

Grayson County

Fannin County

0821D

0821A

0821B

Collin County

Wilson Creek

-Bacteria

0821C

Other Concerns

-Nutrients
-TSS
-TDS

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What is a WPP?

1. WPPs are a voluntary, proactive approach to integrating activities and prioritizing BMP implementation

2. WPPs address complex water quality issues across multiple jurisdictions

3. The goal is to improve, restore or maintain good water quality within a particular watershed

4. WPPs are tools to better leverage resources

The Lake Lavon WPP

- Development will begin in 2016.

- Aimed at developing a strategy to address existing impairments and protect against future impairments.

- Primary focus on bacteria and nutrient pollution.

- Collaborative effort between NTMWD, Texas A&M AgriLife, and the Texas State Soil and Water Conservation Board (TSSWCB).

- Development will be facilitated by NTMWD's watershed manager position and supported by a TSSWCB state nonpoint source program grant.

The Lake Lavon WPP

- TSSWCB nonpoint source program grant will provide support for:

- Water quality monitoring.

- Land use land cover analysis.

- Pollutant source analysis and water quality modeling. (SELECT)

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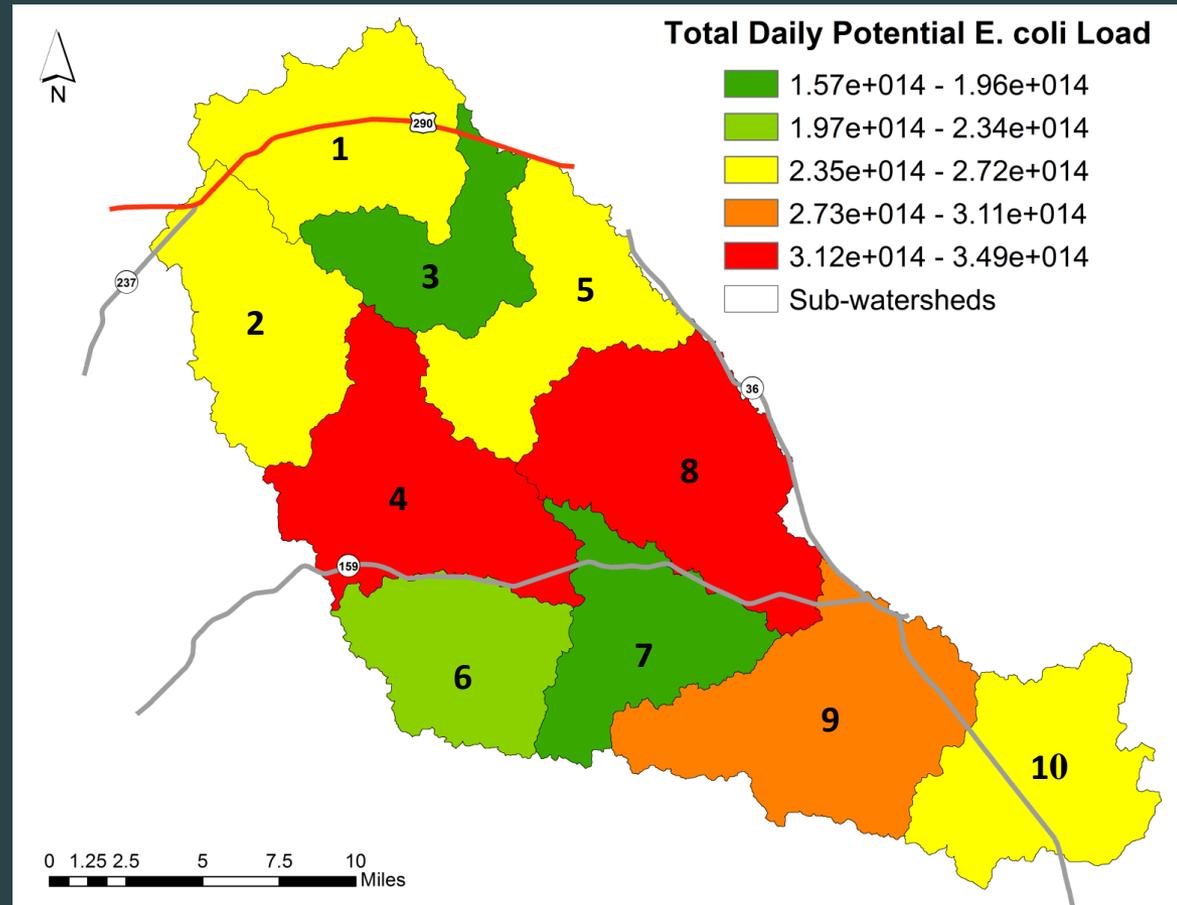- Improving the SELECT model through the Lake Lavon WPP

SELECT Analysis

- Spatially Explicit Load Enrichment Calculation Tool. (SELECT)

    - A commonly used tool for evaluating the <u>potential</u> bacteria loads from nonpoint sources and their likely distribution in a watershed.

    - Helps to identify causes and sources of pollution and develop effective implementation strategies.

SELECT Analysis

1. Estimate populations of bacteria sources.

2. Distribute populations to specified land uses.

3. Calculate potential bacteria load in subwatersheds for each source.

Total Daily Potential E. coli Load

- 1.57e+014 - 1.96e+014
- 1.97e+014 - 2.34e+014
- 2.35e+014 - 2.72e+014
- 2.73e+014 - 3.11e+014
- 3.12e+014 - 3.49e+014
- Sub-watersheds

Improving SELECT

- Use the Lake Lavon planning effort to develop improved SELECT software by working with Texas A&M AgriLife.

- Improvements will incorporate fate and transport of bacteria into SELECT analysis.

  - Distance from stream

  - Land use/land cover

  - Watershed hydrology

Improved SELECT Analysis

- Improvements will allow for:

  - More accurate estimate of bacteria loading from individual sources.

  - Simulate effectiveness of BMP implementation strategies.

  - Ultimately, development of more efficient and effective implementation strategies.

Questions