# Protecting Our Water: Tracking Sources of Bacterial Contamination

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## BACKGROUND

Numerous surface waterbodies in Texas are classified as having high levels of fecal coliform bacteria, an indicator of fecal pollution. The presence of high numbers of fecal coliforms indicates that disease-causing microorganisms (pathogens) sometimes found in animal and human wastes may also be present. Current laboratory tests used to identify *E. coli* and other fecal coliform bacteria do not provide information on whether the source of pollution is from sewage, runoff of animal wastes, failing septic tanks, wildlife or other sources. The sources of pollution need to be identified to implement effective pollution control strategies to improve water quality and reduce human health risk during contact recreation. Bacterial source tracking (BST) techniques may be used to help identify human and animal fecal pollution sources.

Lake Waco, Texas, site of one of several bacterial source tracking studies
Photo: US Army Corps of Engineers

## OBJECTIVES

- To develop state-of-the-art genetic fingerprint BST libraries for *E. coli* bacteria isolated from known human and animal fecal sources collected from impaired Texas watersheds.
- Use the developed *E. coli* BST libraries to identify the animal or human origin of *E. coli* bacteria obtained from water samples, thereby identifying human and animal nonpoint sources of fecal contamination.
- To provide BST data which can be used by the Texas State Soil and Water Conservation Board (TSSWCB) and the Texas Commission on Environmental Quality (TCEQ) to develop water quality protection strategies.

*RiboPrint genetic fingerprinting of E. coli bacteria at Texas AgriLife Research Center, El Paso, Texas. Insets, E. coli isolated from water and fecal samples*

## FINDINGS AND BENEFITS

- Results of this research helped identify nonpoint human and animal sources of fecal pollution impacting several Texas waters, including: Lake Waco, Lake Belton, Leon River, Peach Creek, San Antonio area waters, Lake Granbury, and Buck Creek. Results are being used to develop effective water quality protection plans to improve and conserve our water resources and protect human health.
- Data from recent projects have allowed the development of a statewide BST library. Use of the developed Texas *E. coli* BST Library is providing significant cost and time savings for current and future projects.
- The project team received a **Texas Environmental Excellence Award**, the state's highest environmental honor, for this research.

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