

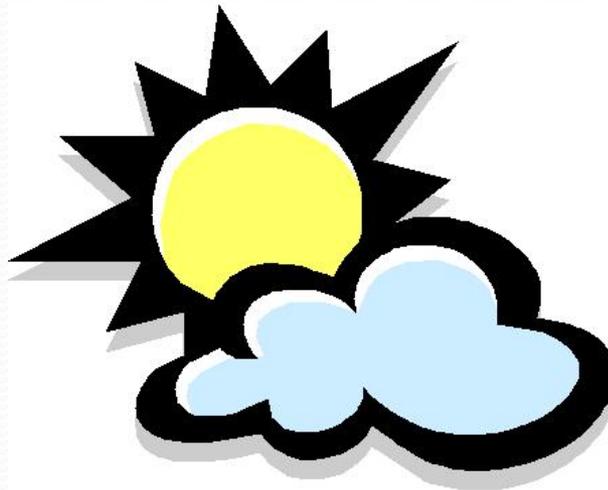
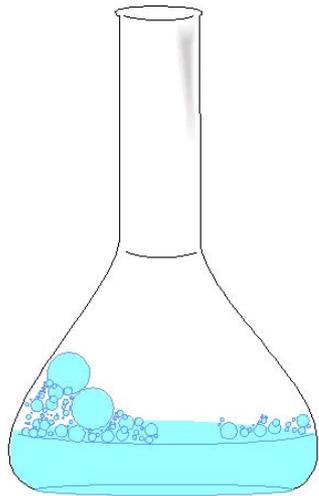
# Mid Pecan Bayou Recreational Use Attainability Analysis Introduction to Water Quality

Pamela Casebolt  
Texas State Soil and Water Conservation Board

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Brownwood, Texas

# Federal Clean Water Act

- Objective is to “restore and maintain the chemical, physical and biological integrity of the Nation’s waters”



# Federal Clean Water Act

- Interim goal is “water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water”
  - Commonly referred to as “fishable/swimmable” goal
- Administered and implemented by the U.S. Environmental Protection Agency (USEPA)

# Water Quality Standards

- Clean Water Act requires States to establish Water Quality Standards to achieve objectives and goals of the Act
- Water Quality Standard is defined as the designated beneficial uses of a water segment and the water quality criteria necessary to protect those uses

# Water Quality Standards

- Uses include contact recreation (swimming), aquatic life, domestic water supply, fish consumption, etc.
- Criteria for parameters include bacteria, dissolved oxygen, salts, toxic substances



# Water Quality Standards

- Use = Primary Contact Recreation
  - Recreational activities involving significant risk of ingestion of water, including wading by children, swimming, water skiing, diving, and surfing
  - Applied to all rivers, streams, lakes, and estuaries in Texas with few exceptions (e.g. Houston Ship Channel)
- Criteria = Escherichia coli (E. coli) bacteria, for freshwater streams
  - Geometric mean (similar to the average) of samples should not exceed 126 colony-forming units of bacteria per 100 mL of water

# 2010 Texas Water Quality Standards – Tiers for Recreational Use

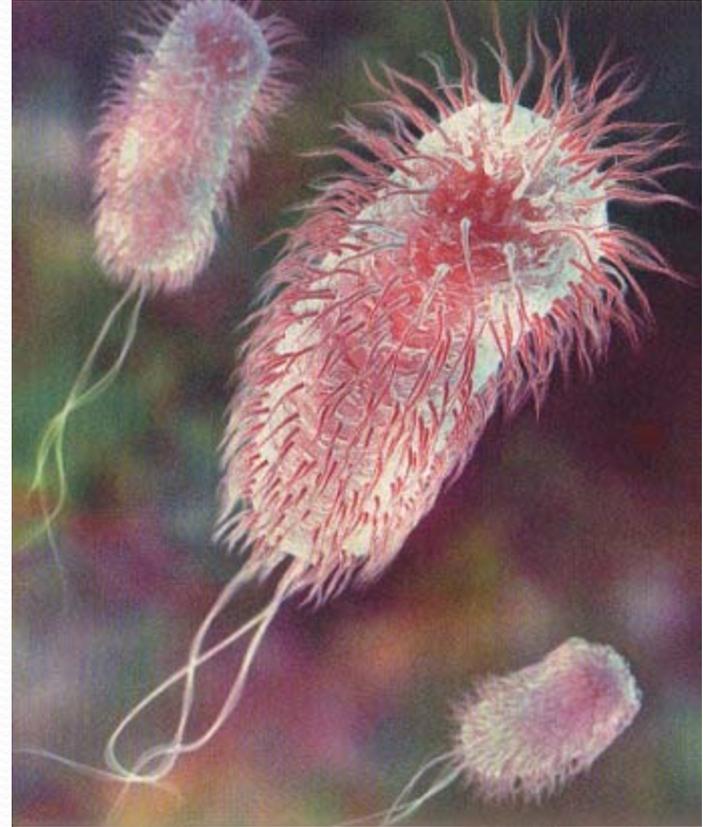
- Approved by TCEQ on June 30, 2010
- Awaiting EPA action
- Primary Contact Recreation (126 cfu/100 mL)
  - Involves a significant risk of water ingestion
    - Wading children
    - Swimming
    - Whitewater kayaking/Canoeing/Rafting
    - Waterskiing, diving, tubing, surfing
- Secondary Contact Recreation 1 (630 cfu/100 mL)
  - Commonly occur but have limited body contact incidental to shoreline activities that pose a less significant risk of water ingestion
    - Fishing
    - Motor boating/Canoeing/Rafting
    - Incidental body contact from shoreline

# 2010 Texas Water Quality Standards – Tiers for Recreational Use

- Secondary Contact Recreation 2 (1,030 cfu/100 mL)
  - Activities that occur less frequently than Secondary Contact Recreation 1 due to physical characteristics of the waterbody and limited public access
- Noncontact Recreation (2,060 cfu/100 mL)
  - Activities that do not involve a significant risk of water ingestion such as those with limited body contact incidental to shoreline activity
    - Birding
    - Hiking/Biking
    - Where Primary Contact Recreation and Secondary Contact Recreation should not occur due to unsafe conditions such as ship and barge traffic.

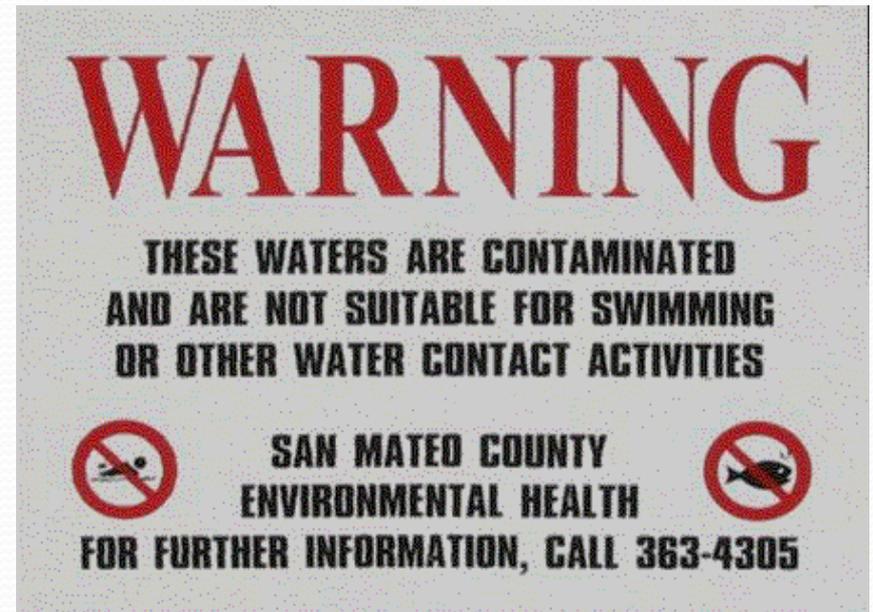
# Why Bacteria?

- Elevated levels of bacteria (E. coli, Enterococcus, fecal coliform) indicate possible fecal contamination and the potential presence of disease-causing pathogens

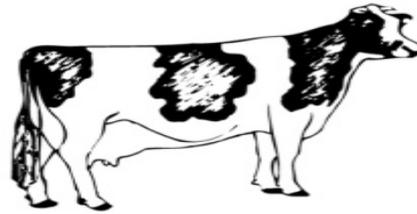


# Why Bacteria?

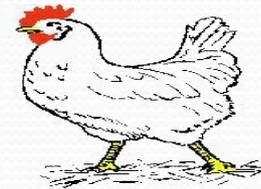
- These bacteria are present in the intestinal tracts and feces of warm-blooded animals
- Pathogens cause gastrointestinal (GI) illness



# Sources of Bacteria



Sources  
of bacteria



# Sources of Bacteria

- Improperly treated human waste from malfunctioning wastewater treatment facilities or septic systems
- Buildup on the land surface and then washoff during rain events of pet, livestock, feral hogs, and wildlife feces
- Direct deposition of feces by pets, livestock, feral, hogs, and wildlife into waterbodies

# 303(d) List

- Clean Water Act requires Texas to identify waterbodies failing to meet or not expected to meet water quality standards and not supporting their designated uses
- This list of impaired waterbodies is known as the Texas 303(d) List
- Must be submitted to USEPA for review and approval every two years

# 303(d) List

- 2008 Texas 303(d) List was approved by USEPA on July 9, 2008
  - Data from December 1999 to November 2006 was assessed
  - 837 waterbody-pollutant combinations
  - 48% of these are for elevated bacteria
- 2010 303(d) List was approved by TCEQ on August 25, 2010
  - Awaiting decision by USEPA
  - Data from December 2001 to November 2008 was assessed

# Who Does What?

- Texas Commission on Environmental Quality (TCEQ)
  - General jurisdiction and responsibility for water quality in Texas
  - Establish water quality standards
  - Issue permits for point sources (wastewater treatment facilities, concentrated animal feeding operations)
  - Prevent and abate urban nonpoint source pollution
  - Collect and assess data, report on water quality conditions (303(d) List)
  - Regulatory enforcement of water quality standards and permits



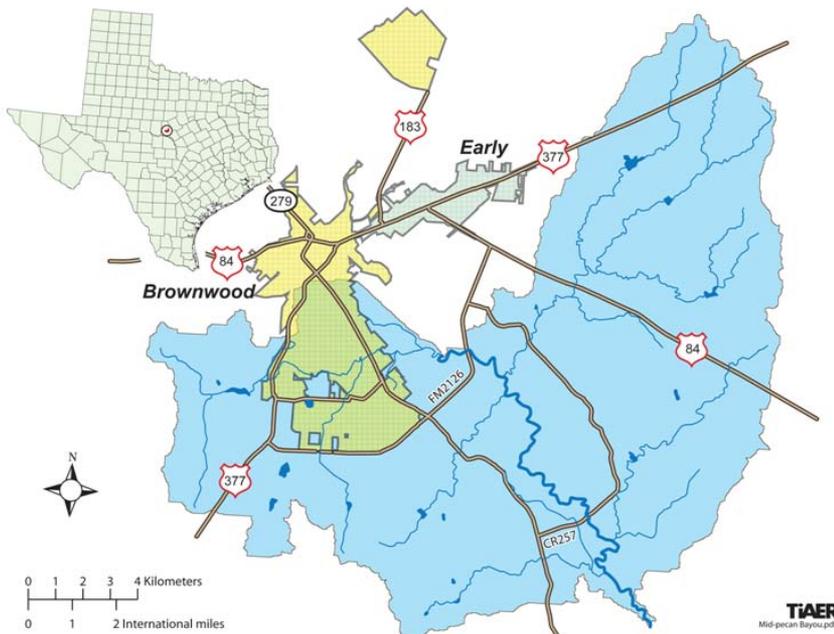
# Who Does What?



- Texas State Soil and Water Conservation Board (TSSWCB)
  - Lead agency in Texas responsible for planning, implementing, and managing programs and practices for preventing and abating agricultural and silvicultural (forestry) nonpoint sources of water pollution
  - Works in partnership with the State's 216 local soil and water conservation districts (SWCDs)
  - Provides technical assistance and financial incentives to landowners to develop and implement Water Quality Management Plans and best management practices on agricultural lands

# Mid Pecan Bayou

- Mid Pecan Bayou is located in Brown County, southeast of Brownwood and extends from a point immediately upstream of the confluence of Mackinally Creek to a point immediately upstream of Willis Creek.
- First listed on the 2006 303(d) List for elevated levels of bacteria



# Addressing the impairment

- Goal = remove from 303(d) List
  - Achieving water quality standards based on additional surface water quality monitoring
  - Support a Use Attainability Analysis to ensure the most appropriate water quality standard is applied
  - Develop a Watershed Protection Plan
  - Develop a Total Maximum Daily Load and Implementation Plan for adoption/approval

# Addressing the impairment

- TSSWCB grant to Texas AgriLife Research and Extension Center at Stephenville and Texas Institute for Applied Environmental Research to conduct a Recreational Use Attainability Analysis on Mid Pecan Bayou

# Pamela Casebolt Project Manager

Texas State Soil and Water Conservation Board  
Statewide Resource Management Team

P.O. Box 658  
Temple, TX 76503  
254-773-2250 ext 247

[pcasebolt@tsswcb.state.tx.us](mailto:pcasebolt@tsswcb.state.tx.us)  
<http://www.tsswcb.state.tx.us>

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