La Nana Bayou Watershed

Historical Water Quality

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Angelina & Neches River Authority
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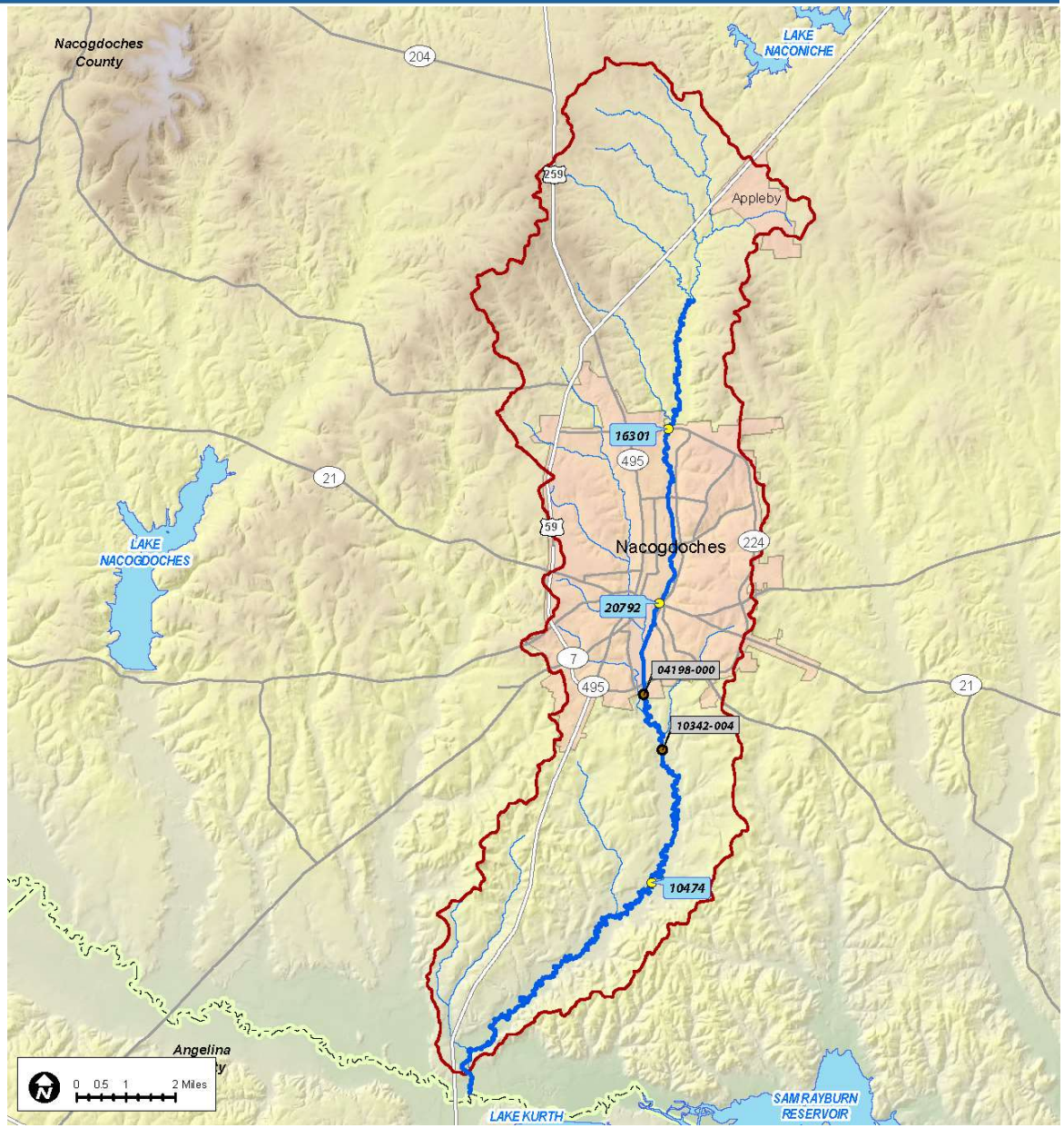
La Nana Bayou Watershed

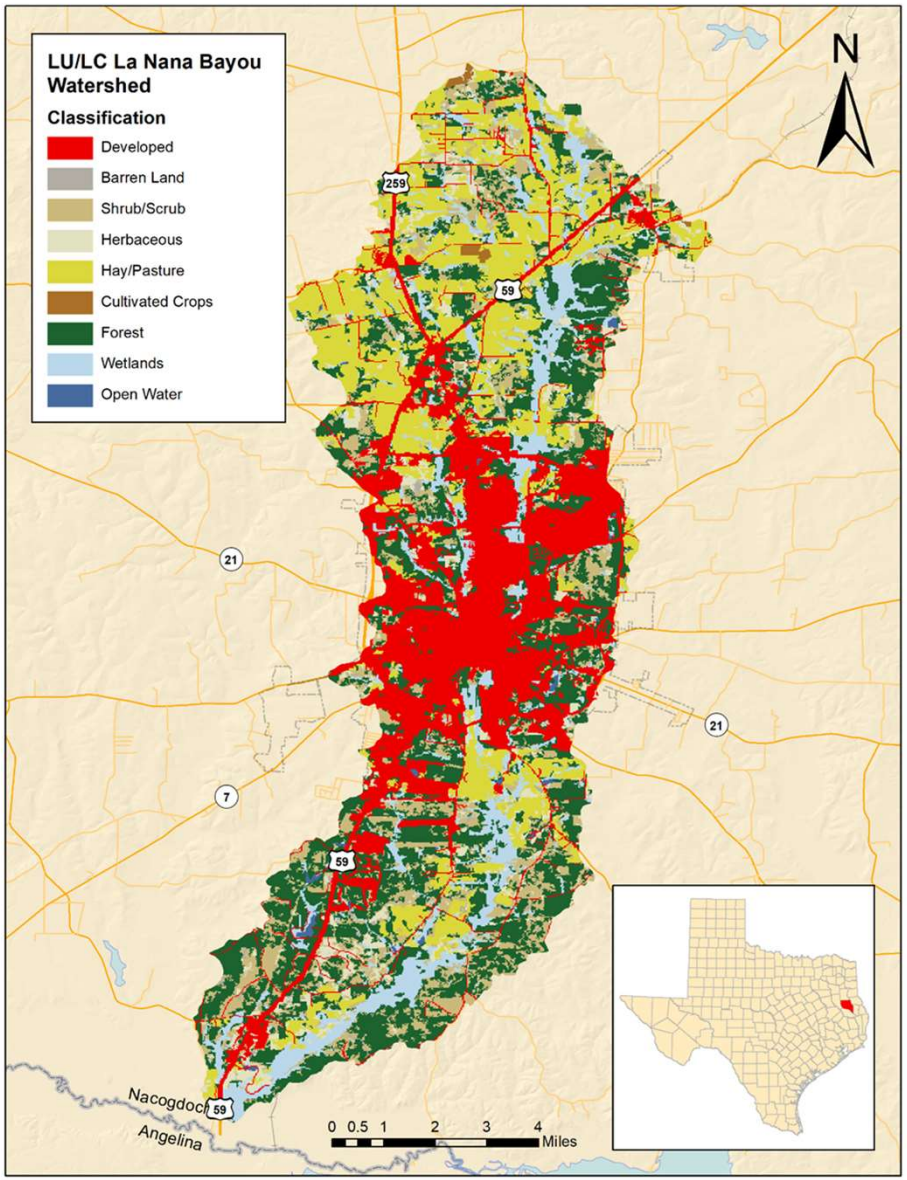
- Approximately 83 square miles
- Population (2010 Census):
  - 36,000 in watershed
  - 32,000 in Nacogdoches
- Elevations:
  - Minimum: 175 MSL
  - Maximum: 615 MSL
  - Mean: 358 MSL
- Annual Rainfall (1981-2010):
  - Minimum: 50”
  - Maximum: 51.7”
  - Mean: 51”
- Mean Annual Streamflow Rates:
  - 80 CFS at the southernmost
  - 48 CFS below Nacogdoches
  - 21 CFS above Nacogdoches
- Three Quarterly Monitoring Sites
- Two permitted Discharges



La Nana Bayou Watershed Characteristics

- The large majority of the watershed land use/land cover falls into three categories:
  - Forest (26.65%)
  - Developed lands (24.73%)
  - Pasture/hay (19.80%)

- The bulk of the developed lands are within the city limits of Nacogdoches and Appleby, but there are some along the highway corridors as well



Texas Surface Water Quality Standards

- Water Quality Standards are set by the Texas Commission on Environmental Quality (TCEQ) under Texas Water Code Section 26.023
- Reviewed every 3 years, requires EPA approval
- Waterbodies are assigned specific uses in which they must meet certain criteria:
  - Uses:
    - General Use
    - Aquatic Life Use
    - Recreational Use
    - Public Water Supply
    - Fish Consumption Use
  - Criteria: the limit used to evaluate whether or not a waterbody meets its specific use.

La Nana Bayou Designated Use

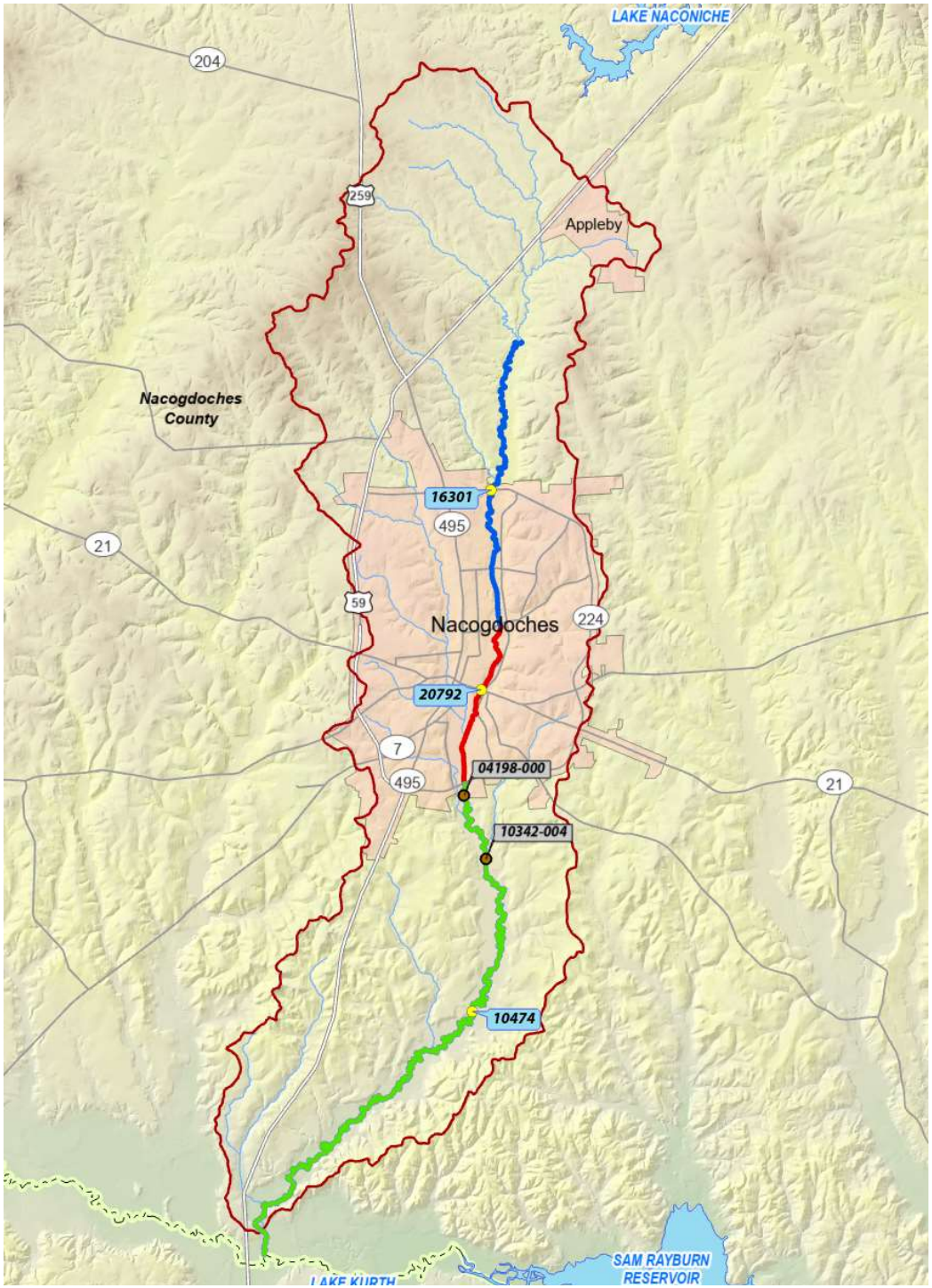
La Nana Bayou has a designated use of Primary Contact Recreation.

- Primary Contact Recreation (PCR) activities involve a significant risk of ingestion of water. Activities include wading, swimming, etc.
- A waterbody does not meet the standard for Primary Contact Recreation Use if the geometric mean for previous 7 years is greater than 126cfu/100mL for *E.coli* in freshwater streams.

Water Quality Impairments in La Nana Bayou

La Nana Bayou is listed in the 2020 Texas Integrated Report as not meeting the water quality standard for Primary Contact Recreation for *E.coli* bacteria.

- AU 0611B_01: Bacterial geomean of 303.07 does not meet water quality standard for Primary Contact Recreation for *E.coli* bacteria. This AU is also listed with concerns for Nitrate Nitrogen and Total Phosphorus.
- AU 0611B_02: Bacterial geomean of 493.92 does not meet water quality standard for Primary Contact Recreation for *E.coli* bacteria
- AU 0611B_03: Bacterial geomean of 278.47 does not meet water quality standard for Primary Contact Recreation for *E.coli* bacteria



Monitoring Stations

- AU 0611B_03 (Blue)

  Station 16301
  La Nana Bayou at Loop 224
  Monitoring began in 1998

- AU 0611B_02 (Red)

  Station 20792
  La Nana Bayou at East Main Street
  Monitoring began in 2010

- AU 0611B_01 (Green)

  Station 10474
  La Nana Bayou at CR 526
  Monitoring began in 1969

Water Quality Monitoring in La Nana Bayou

Parameters Collected:

Field:

- Dissolved Oxygen
- Days Since Last Significant Rainfall
- Water Temperature
- Flow Severity
- Instantaneous Stream Flow
- pH
- Present Weather
- Secchi Transparency
- Specific Conductivity
- Total Water Depth

Conventional:

- Ammonia-N
- Chloride
- Chlorophyll-*a*
- Total Kjeldahl Nitrogen (TKN)
- Nitrate-N
- Nitrite-N
- Pheophytin-*a*
- Sulfate
- Total Phosphorus
- Total Suspended Solids (TSS)

Bacteriological:

- *Escherichia Coli (E.coli)*

La Nana Bayou Potential Watershed E.coli Sources

Wildlife are present in virtually all watersheds and are known to congregate in stream and riparian areas.

- Estimated Wildlife populations:
  - Deer 879
  - Feral hogs 1193

Livestock operations or the use of manure fertilizer can introduce E.coli bacteria into the watershed

- Estimated Livestock populations
  - Cattle 2,665
  - Sheeps/goats 48
  - Horses 146
  - Poultry 961,130

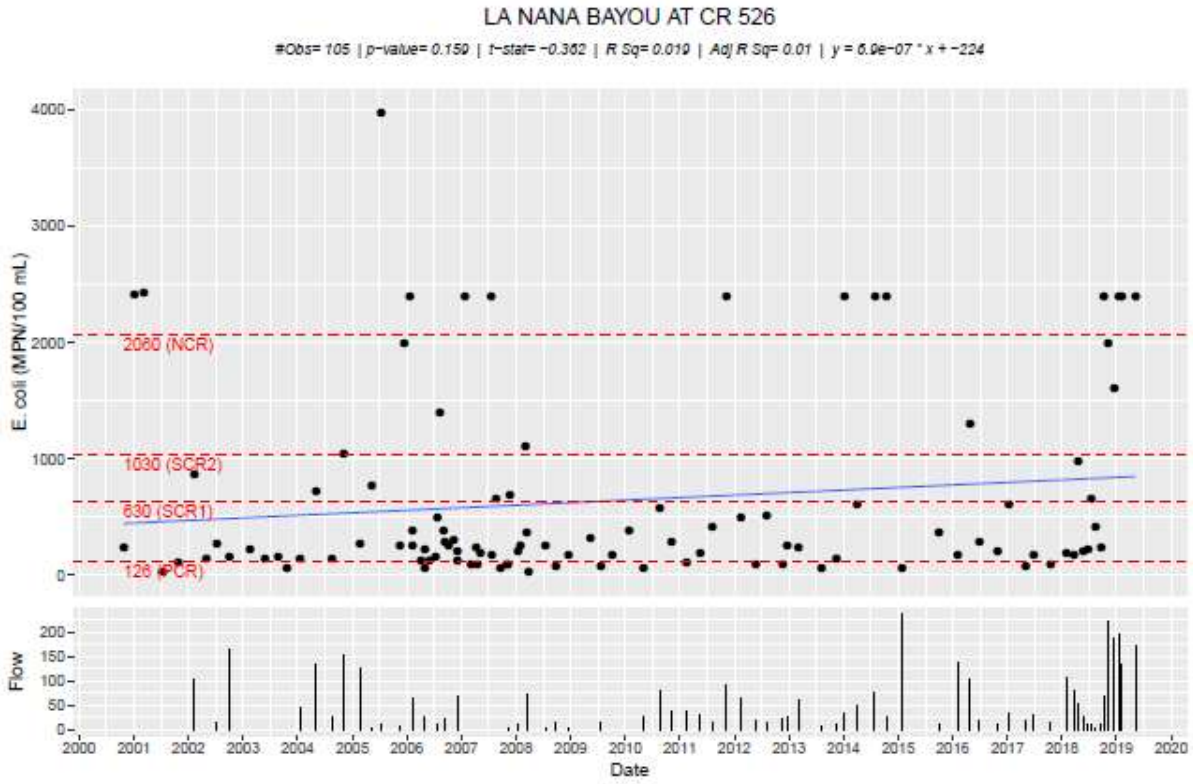
Household pets can contribute to bacteria loads, if pet waste is allowed to remain on the ground

- Estimated dog population: 8,838

Other potential sources of E.coli:

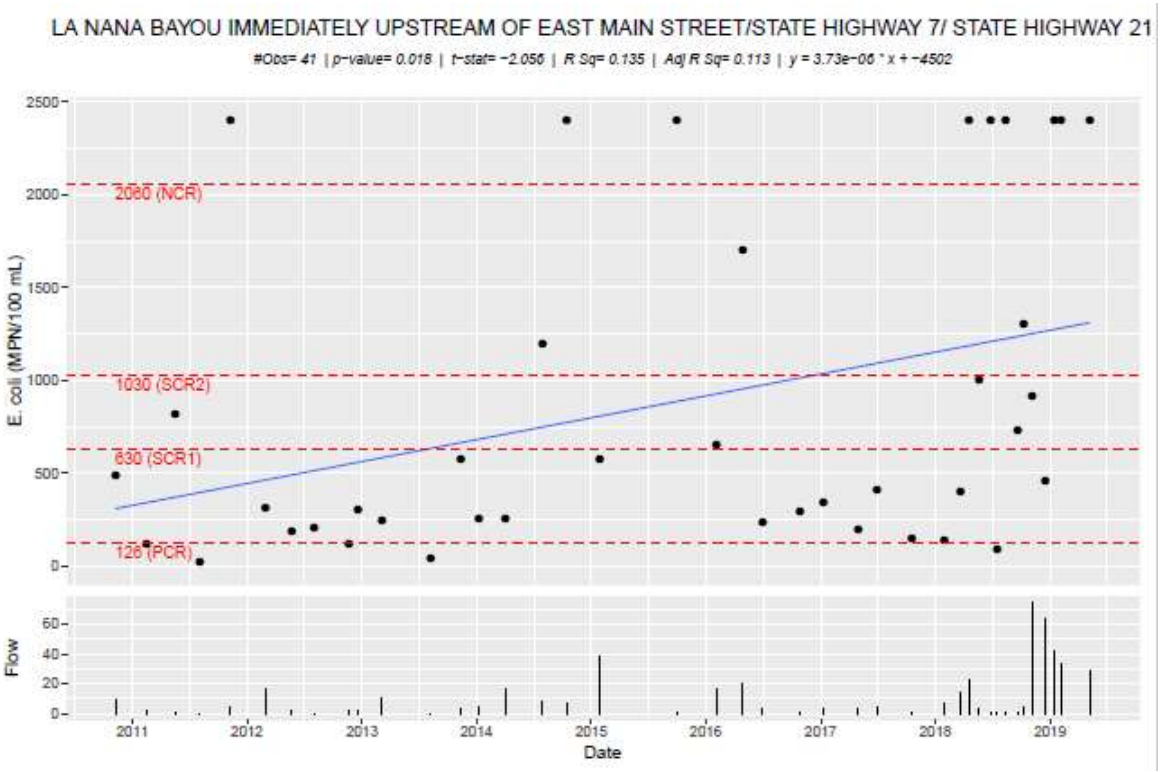
- Wastewater treatment and other discharge facilities
  - 1 active, and 1 inactive in the watershed
- On-Site Sewage Facilities (OSSFs)(Septic Systems)
  - approx. 2,381 in watershed
- Non point source pollution

AU 0611B_01- Station 10474



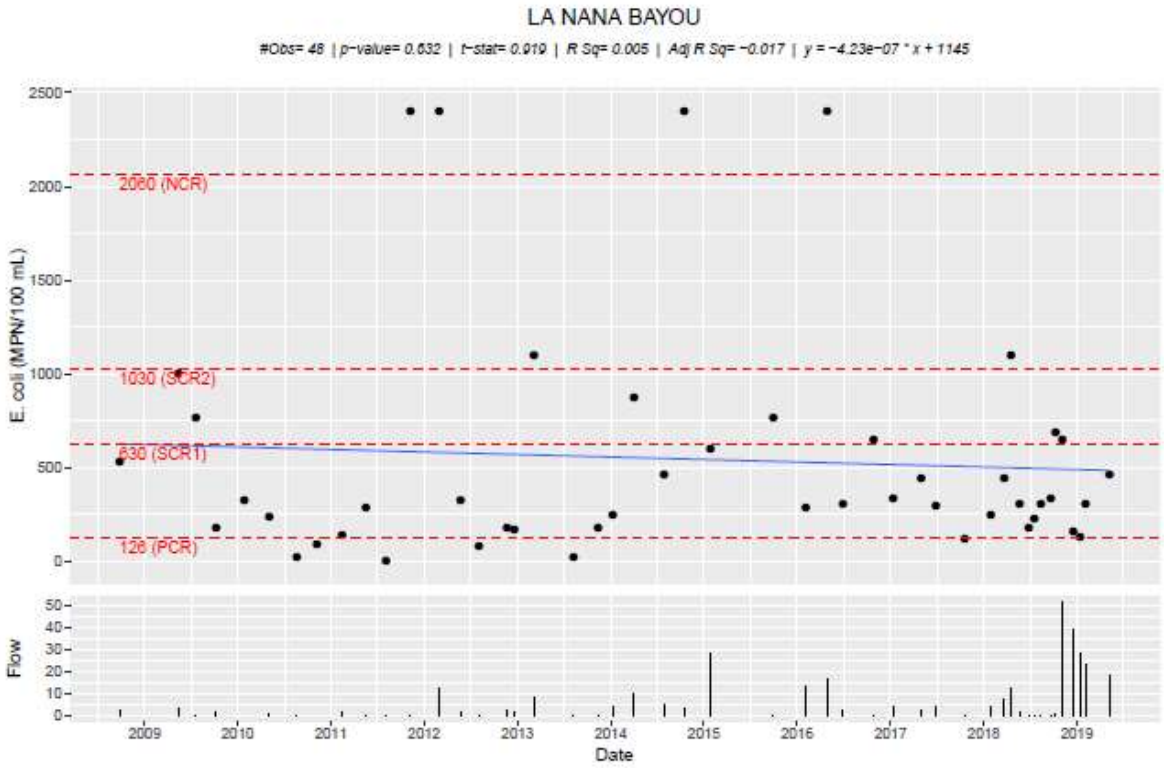
- E.coli Geomean: **303.7**
- Concerns:
  - Nitrate Nitrogen
  - Total Phosphorus
- Potential E.coli sources:
  - Failing OSSFs
  - Feral hogs
  - Livestock
  - Wildlife

AU 0611B_02- Station 20792



- E.coli Geomean: **493.92**
- No other concerns or impairments listed for this station
- Potential E.coli sources:
  - Stormwater infrastructure
  - Wastewater infrastructure

AU 0611B_03- Station 16301



- E.coli Geomean: **278.47**
- No other concerns or impairments listed for this station
- Potential E.coli sources:
  - Failing OSSFs
  - Feral hogs
  - Livestock
  - Wildlife

Additional Resources

- Texas Commission on Environmental Quality Clean Rivers Program
  - http://www.texascleanrivers.org
- ANRA CRP Monitoring Activities
  - http://www.anra.org/divisions/water_quality/crp/monitoring.html
- Coordinated Monitoring Schedule
  - http://cms.lcra.org
- Please direct inquiries regarding ANRA's Clean Rivers Program to:

Carla Ethridge
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Angelina & Neches River Authority
2109 N John Redditt Dr.
Lufkin, TX 75904
Phone: 936-632-7527
Email: cethridge@anra.org

Comments or Questions?

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