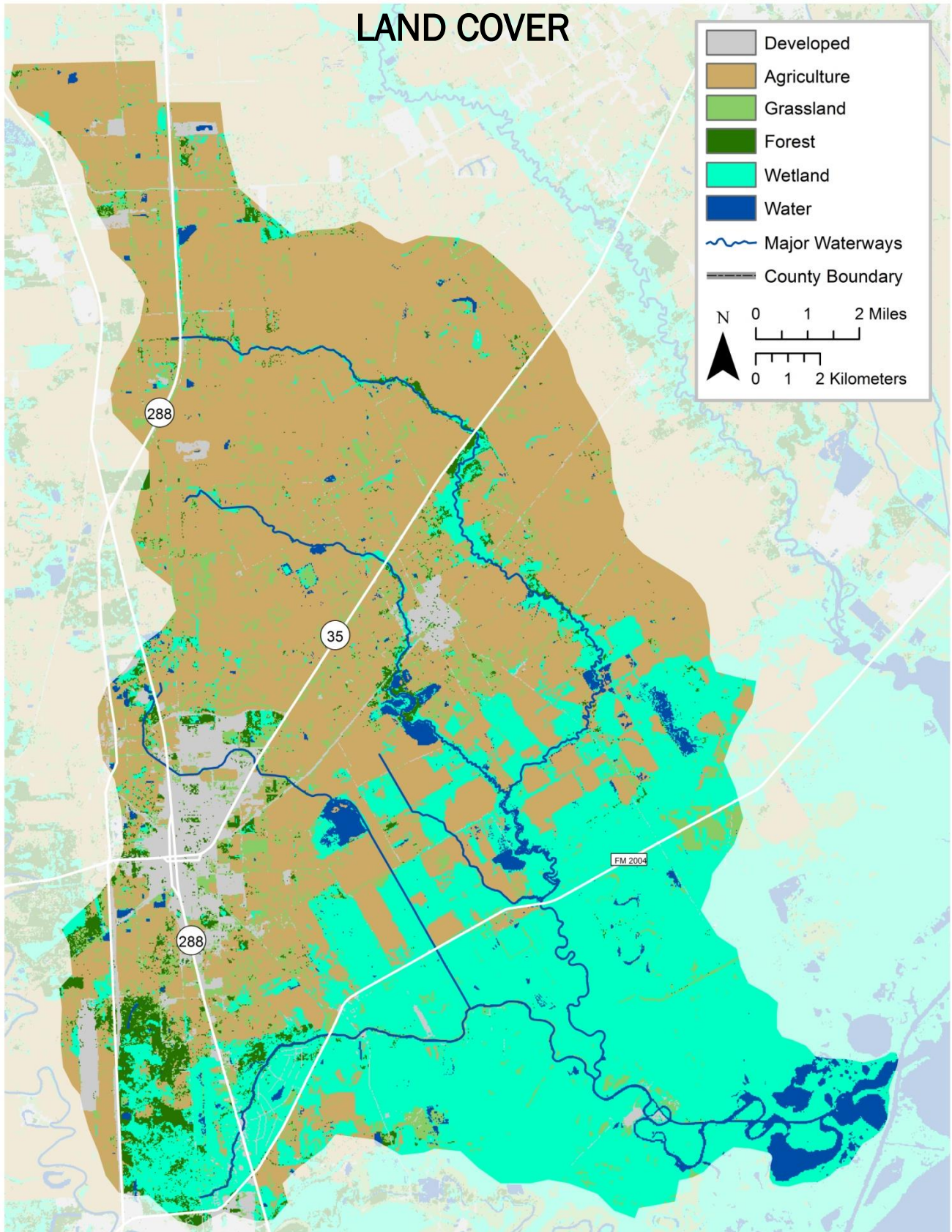


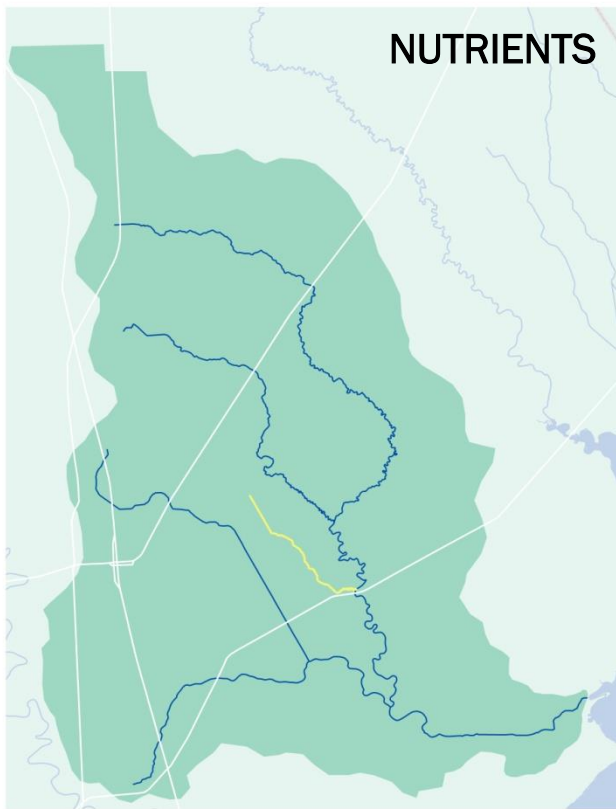
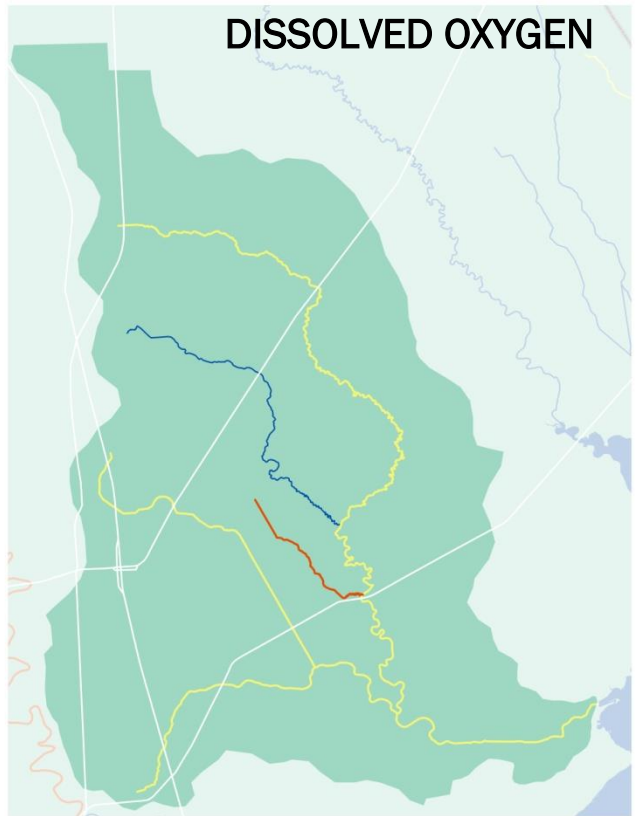
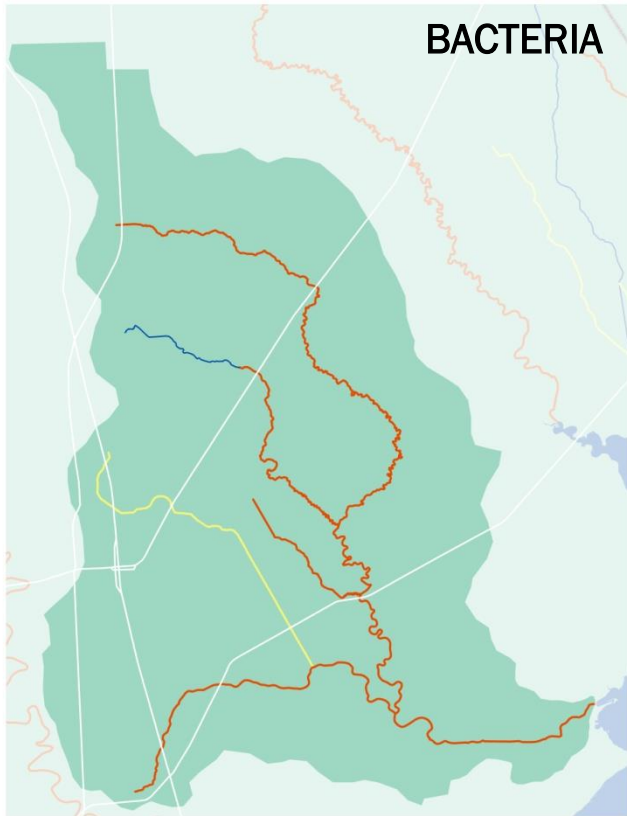
# BASTROP BAYOU TIDAL - SEGMENT 1105



# BASTROP BAYOU TIDAL - SEGMENT 1105

## LAND COVER





 Impairment     Concern     No Impairments or Concerns

<b>Segment Number:</b> 1105	<b>Name:</b> Bastrop Bayou Tidal
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<b>Length:</b> 19 miles	<b>Watershed Area:</b> 217 square miles	<b>Designated Uses:</b> Primary Contact Recreation 1, High Aquatic Life
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<b>Number of Active Monitoring Stations:</b> 10	<b>Texas Stream Team Monitors:</b> 1	<b>Permitted Outfalls:</b> 9
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<b>Description:</b>	<p>Segment 1105 (Tidal Stream w/ high ALU): From the confluence with Bastrop Bay 1.1 km (0.7 miles) downstream of the Intracoastal Waterway in Brazoria County to a point 8.6 km (5.3 mi) upstream of Business 288 at Lake Jackson in Brazoria County.</p> <p>Segment 1105 A (Perennial Stream w/ intermediate ALU): Flores Bayou (unclassified water body) – From a point 2.6 km (1.6 mi) downstream of County Road 171 upstream to SH35 in Brazoria County</p> <p>Segment 1105B (Tidal Stream w/ high ALU): Austin Bayou Tidal (unclassified water body) – From the Bastrop Bayou Tidal confluence to the FM 2004 bridge crossing in Brazoria County</p> <p>Segment 1105C (Perennial Stream w/ high ALU): Austin Bayou Above Tidal (unclassified water body) – From FM 2004 upstream (Austin Bayou Tidal upper boundary) to 1.73 mi upstream from where the water body crosses County Road 51</p> <p>Segment 1105D (Perennial Stream w/ high ALU): Unnamed Tributary of Bastrop Creek (unclassified water body)—From the Bastrop Bayou Tidal confluence to 0.57 km (0.35 mi) upstream of SH 288 Bus in Brazoria County</p> <p>Segment 1105E (Perennial Stream w/ high ALU): Brushy Bayou (unclassified water body) – From the confluence with Austin Bayou Above Tidal (1105C) upstream to end of canal approximately 0.4 mi upstream of FM210 crossing east of the City of Angleton in Brazoria County</p>
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Percent of Stream Impaired or of Concern						
Segment ID	PCBs/Dioxin	Bacteria	Dissolved Oxygen	Nutrients	Chlorophyll a	Other
1105	-	100	100	-	-	-
1105A	-	62	-	-	-	-
1105B	-	100	100	-	-	-
1105C	-	100	100	-	-	-
1105D	-	100	100	-	-	-
1105E	-	100	100	100	-	-

**Segment 1105**

Standards	Tidal Stream	Perennial Stream	Screening Levels	Tidal Stream	Perennial Stream
Temperature (°C/°F):	35 / 95	35 / 95	Ammonia-N (mg/L):	0.46	0.33
Dissolved Oxygen (24-Hr Average) (mg/L):	4.0	5.0 / 4.0	Nitrate-N (mg/L):	1.10	1.95
Dissolved Oxygen (Absolute Minima) (mg/L):	3.0	3.0 / 3.0	Orthophosphate Phosphorus (mg/L):	0.46	0.37
pH (standard units):	6.5-9.0	6.5-9.0	Total Phosphorus-P (mg/L):	0.66	0.69
Enterococci (MPN/100mL) (grab):	89		Chlorophyll a (µg/L):	21	14.1
Enterococci (MPN/100mL) (geometric mean):	35				
<i>E. coli</i> (MPN/100 mL) (grab):		399			
<i>E. coli</i> (MPN/100 mL) (geometric mean):		126			

**FY 2016 Active Monitoring Stations**

Site ID	Site Description	Frequency	Monitoring Entity	Parameter Groups
11475	Bastrop Bayou at CR 227	Quarterly	TCEQ	Field, Conventional, Bacteria, Chlorophyll a
18048	Austin Bayou at FM 2004	Quarterly	EIH	Field, Conventional, Bacteria
18502	Bastrop Bayou near CR 201	Quarterly	EIH	Field, Conventional, Bacteria
18503	Bastrop Bayou Upstream FM 2004	Quarterly	EIH	Field, Conventional, Bacteria
18504	Bastrop Bayou Bastrop Beach Rd	Quarterly	EIH	Field, Conventional, Bacteria
18505	Bastrop Bayou Brazoria CR 504	Quarterly	EIH	Field, Conventional, Bacteria
18506	Austin Bayou At Brazoria CR 210	Quarterly	EIH	Field, Conventional, Bacteria
18507	Austin Bayou N of Bastrop Bayou Confluence	Quarterly	EIH	Field, Conventional, Bacteria
18508	Flores Bayou at Brazoria CR 210	Quarterly	EIH	Field, Conventional, Bacteria
18509	Tributary of Bastrop Bayou Tidal upstream of CR 210	Quarterly	EIH	Field, Conventional, Bacteria
21734	Brushy Bayou at CR 213	Quarterly	EIH	Field, Conventional, Bacteria
21735	Tributary of Bastrop Bayou Tidal at CR 213	Quarterly	EIH	Field, Conventional, Bacteria

## Water Quality Issues Summary

Issue	2014 Assessment <i>I - Impaired</i> <i>C - Of Course</i>	Possible Causes / Influences / Concerns Voiced by Stakeholders	Possible Solutions / Actions To Be Taken
<b>Elevated Levels of Indicator Bacteria</b>	1105 I 1105A I 1105B I 1105C I 1105D C 1105E I	<ul style="list-style-type: none"> <li>▪ Animal waste from agricultural production and domestic animal facilities</li> <li>▪ Constructed stormwater controls failing</li> <li>▪ Developments with malfunctioning OSSFs</li> <li>▪ Improper or no pet waste disposal</li> <li>▪ Poorly operated or undersized WWTFs</li> <li>▪ WWTF non-compliance, overflows, and collection system by-passes</li> <li>▪ Direct and dry weather discharges</li> <li>▪ Waste haulers illegal discharges/improper disposal</li> </ul>	<ul style="list-style-type: none"> <li>▪ Implement stream fencing or alternative water supplies to keep livestock out of or away from waterways</li> <li>▪ Create and implement Water Quality Management Plans for individual agricultural properties</li> <li>▪ Install and/or conserve vegetative buffer areas along all waterways</li> <li>▪ Improve compliance and enforcement of existing stormwater quality permits</li> <li>▪ Improve construction oversight to minimize TSS discharges to waterways</li> <li>▪ Add water quality features to stormwater systems</li> <li>▪ More public education regarding OSSF operations and maintenance</li> <li>▪ Ensure proper citing of new or replacement OSSFs</li> <li>▪ More public education on pet waste disposal</li> <li>▪ Regionalize chronically non-compliant WWTFs</li> <li>▪ Require all systems to develop and implement a utility asset management program and protect against power outages at lift stations</li> <li>▪ Increase monitoring requirements for self-reporting</li> <li>▪ Impose new or stricter bacteria limits than currently designated by TCEQ</li> </ul>
<b>Dissolved Oxygen Concentrations</b>	1105 C 1105B C 1105C C 1105D C 1105E C	<ul style="list-style-type: none"> <li>▪ Excessive nutrients and organic matter from agricultural production, and related activities</li> <li>▪ Excessive nutrients and organic matter from WWTF effluent, SSOs, malfunctioning OSSFs, illegal disposal of grease trap waste, and biodegradable solid waste (e.g., grass clippings and pet waste)</li> <li>▪ High temperature discharges from industrial</li> </ul>	<ul style="list-style-type: none"> <li>▪ Create and implement Water Quality Management Plans for individual agricultural properties</li> <li>▪ Install and/or conserve riparian buffer areas along all waterways</li> <li>▪ Improve compliance and enforcement of existing stormwater quality permits</li> <li>▪ More public education regarding OSSF operation</li> </ul>

		WWTFs	<ul style="list-style-type: none"> <li>and maintenance</li> <li>▪ More public education on pet waste disposal</li> <li>▪ More public education regarding disposal of household fats, oils, and grease</li> <li>▪ Improve operation and maintenance of existing WWTF and collection systems</li> <li>▪ Regionalize chronically non-compliant WWTFs</li> </ul>
Elevated Nutrients	1005E C	<ul style="list-style-type: none"> <li>▪ Agricultural runoff from row crops, fallow fields, and animal operations</li> <li>▪ Fertilizer runoff from urbanized properties, such as landscaped areas, residential lawns, and sport fields</li> <li>▪ WWTF effluent, sanitary sewer overflows, and malfunctioning OSSFs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Create and implement Water Quality Management Plans for individual agricultural properties</li> <li>▪ Implement YardWise and Watersmart landscape practices</li> <li>▪ Install and/or conserve riparian buffer areas along all waterways</li> <li>▪ Monitor phosphorus levels at WWTFs to determine if controls are needed</li> </ul>

### Segment Discussion:

**Watershed Characteristics:** The Bastrop Bayou Watershed is predominantly rural in nature with two urban centers of Danbury and the City of Angleton located in the center and western portions of the watershed, respectively. The area adjacent to and downstream of FM 2004 is primarily undeveloped wetlands, a portion of which is part of the Texas Coastal Preserve. This area is home to extensive habitat, endangered and threatened shorebirds, waterfowl, grassland species, and birds of prey. The primary means of wastewater management in this watershed is on-site sewage facilities (OSSFs). The northern reaches of the watershed is dominated by agricultural land uses.

**Water Quality Issues:** The 2014 Texas Integrated Report (IR) lists the assessment unit 1105\_01 and the tributary 1105B\_01 as impaired for contact recreation due to elevated levels of enterococci bacteria. The 2014 IR also lists the tributaries 1105A\_01, 1105C\_01, and 1105E\_01 as impaired for contact recreation due to high levels of *E. coli*. The TCEQ assessment as well as the H-GAC in house analyses are described below:

Assessment Unit	TCEQ Assessment (2005-2012)	HGAC Analysis 2001-2008	HGAC Analysis 2008-2015
	Geomean (MPN/100 mL) / % Grab Exceedance	Geomean (MPN/100 mL) / % Grab Exceedance	Geomean (MPN/100 mL) / % Grab Exceedance
1105_01	73 / NA	31 / 27.8	84 / 40.4
1105A_01	137 / NA	183 / 25.0	195 / 29.6
1105B_01	41 / NA	17 / 21.4	60 / 37.0
1105C_01	166 / Na	127 / 13.6	368 / 40.7

The segments 1105B and 1105C are new additions to the 2014 303(D) list for bacteria. The assessment unit 1105E\_01 is impaired for depressed dissolved oxygen(DO). Almost 40 percent of DO grab measurements were below the 3.0 mg/L standard. Segments 1105, 1105B, 1105C, and 1105D also have DO grab concerns for water quality based upon screening levels. Segment 1105E has a concern for ammonia with 37.5 percent of samples exceeding the screening criteria.

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This segment does not fully support the Primary Contact Recreation and High Aquatic Life use designations.

**Special Studies/Projects:** H-GAC has been tasked by the TCEQ to implement a basin-wide approach for addressing bacterial impairments for the San Jacinto-Brazos Coastal Basin which includes Chocolate Bayou. Development for the basin-wide TMDL began in September of 2015 and will result in a final Basin 11 Summary Report in September of 2016 that will summarize basin characteristics, water quality impairments, potential bacteria sources, and recommendations for bacterial reduction. Since 2006, H-GAC, TCEQ, and local partners have also been working to develop and implement a Watershed Protection Plan (WPP) for this watershed. H-GAC is currently partnering with TCEQ on an effort to implement select portions of the draft WPP. Please refer to the detailed discussion in the Public Involvement and Outreach section of the 2016 Basin Summary Report for more information about the Bastrop Bayou WPP.

**Trends:** Regression analysis of water quality data revealed statistically significant trends for 11 parameters for five of the six AUs located in the Bastrop Bayou Tidal watershed. The main segment of Bastrop Bayou Tidal had four increasing parameter trends including chloride, salinity, specific conductance (SPCond), and sulfate. Flores Bayou, AU 1105A, revealed an increasing trend in ammonia and instantaneous flow. Austin Bayou Tidal, AU 1105B, had only one significant parameter trend – increasing total suspended solids (TSS). Austin Bayou Above Tidal, 1105C, showed increasing levels of *E. coli*, instantaneous flow, and salinity during the period of record. A gradual decrease in pH was also detected for 1105D, but no significant trends were seen for segment 1105E.

The only significant bacteria trend detected during the period of record was for [Austin Bayou Above Tidal](#). *E. coli* concentrations show a gradual increase over time for this AU with the majority of samples exceeding the 126 MPN/100 mL standard. Although regression analysis did not detect any other changes in bacteria levels over time, [moving seven-year bacteria geometric means](#) revealed a steady rise in enterococci geomeans on the main segment since 2005. [DO concentrations](#) have remained stable throughout the watershed with dips in DO frequently reaching levels less than the 3.0 mg/L minimum standard for the majority of AUs and sampling stations.

It should be noted that less than 50 samples were collected during the period of record in the unclassified segments of this watershed (1105A to 1105E). Due to the relatively small sample size for these segments, identified trends should be evaluated with caution. Additional long term data is required to better assess variations in water quality over time.

## Recommendations

Address concerns found in this segment summary through stakeholder participation and by completing the WPP.

Continue collecting water quality data to support actions associated with WPP development.

Pursue a new local partner to Clean Rivers Program to collect additional data that would help better isolate problem areas.