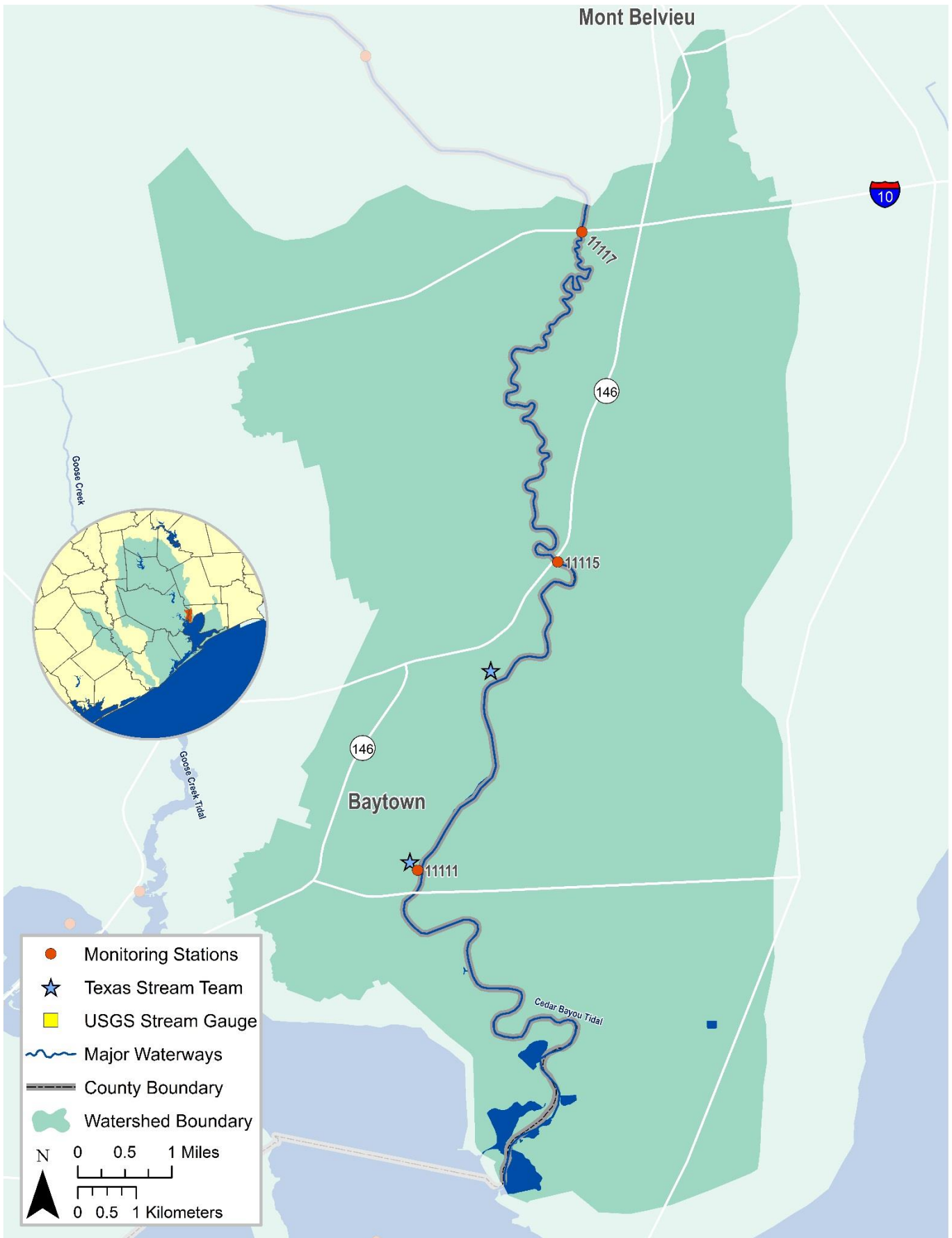
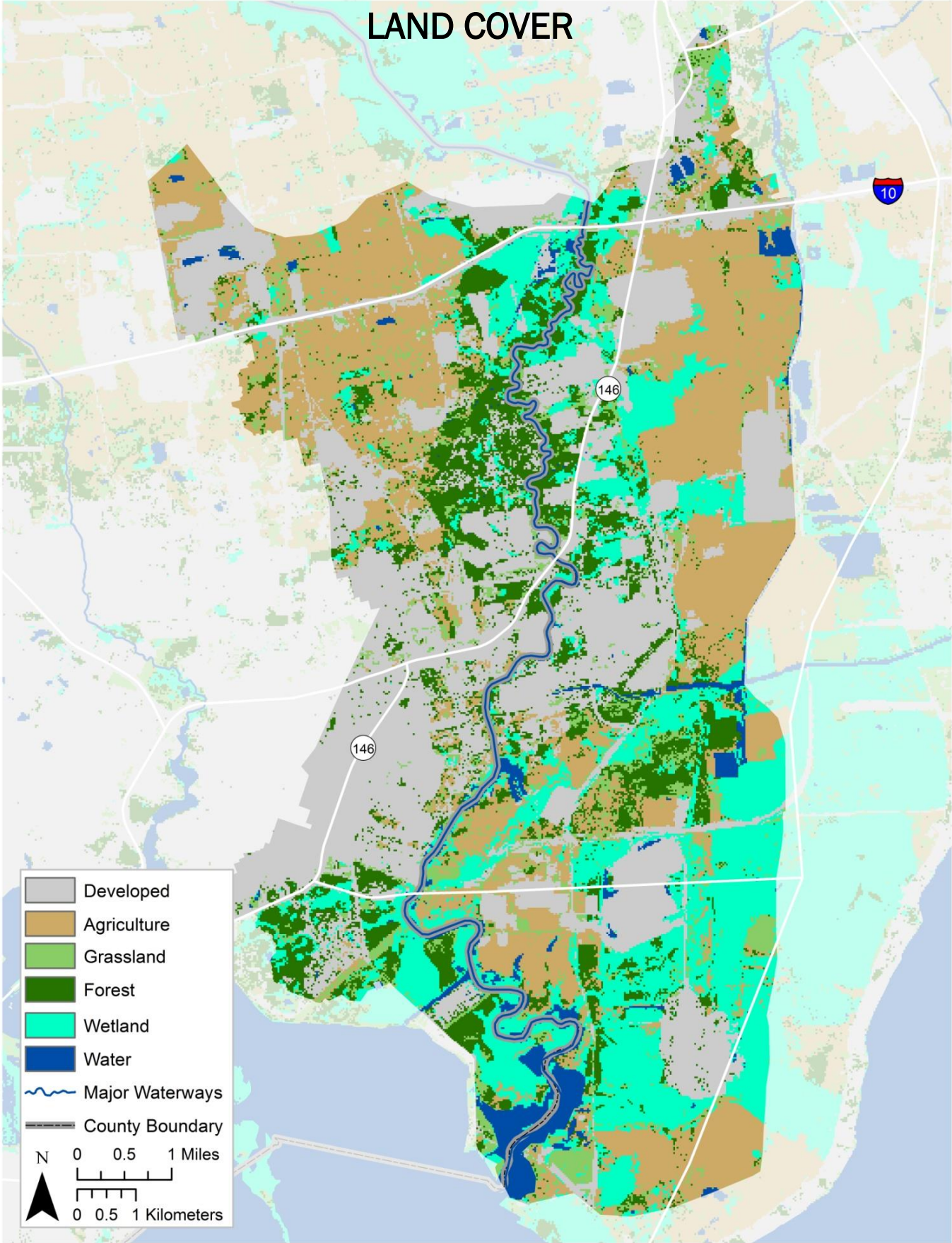


# CEDAR BAYOU TIDAL - SEGMENT 0901

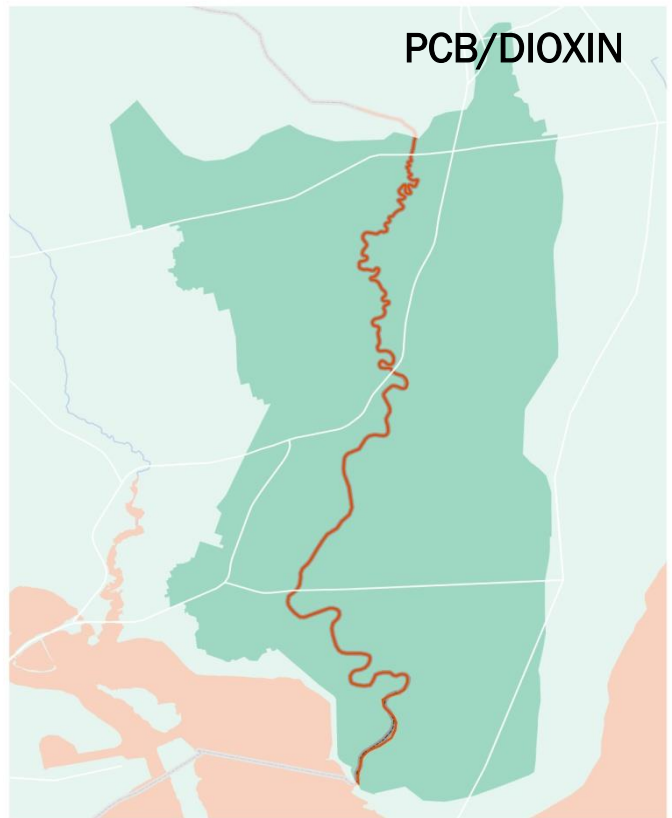
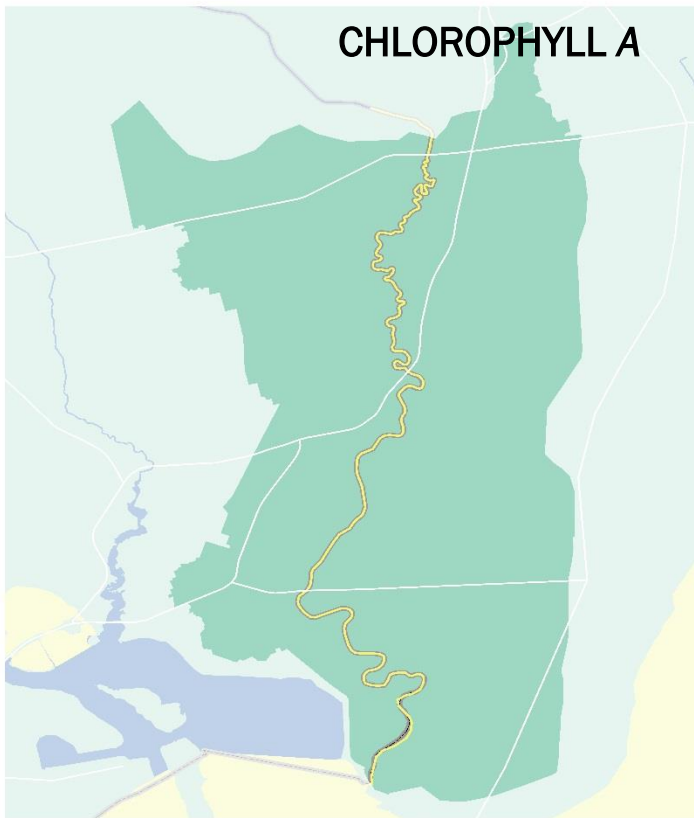
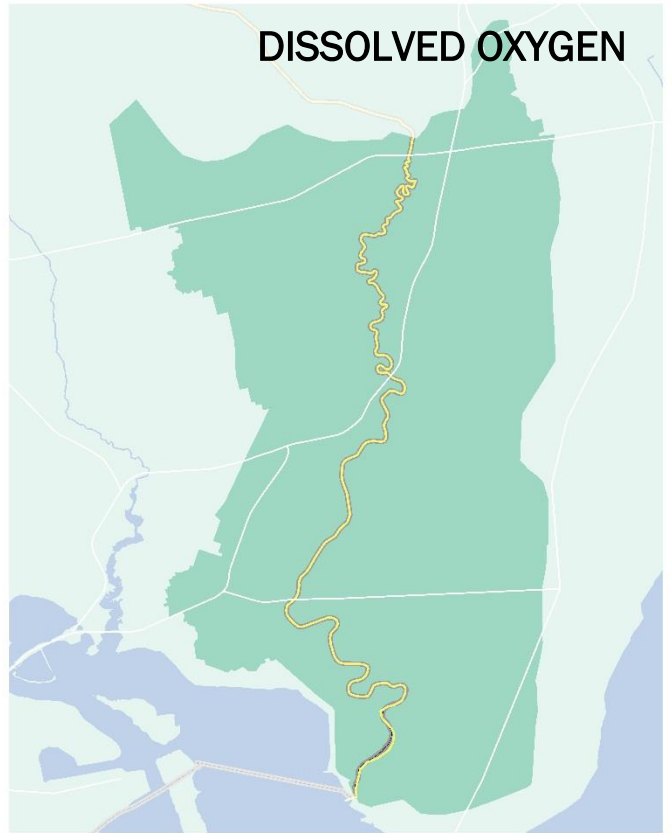


# CEDAR BAYOU TIDAL - SEGMENT 0901

## LAND COVER







 Impairment     Concern     No Impairments or Concerns

<b>Segment Number:</b>	<b>0901</b>	<b>Name:</b>	<b>Cedar Bayou Tidal</b>		
<b>Length:</b>	19 miles	<b>Watershed Area:</b>	53.5 square miles	<b>Designated Uses:</b>	Primary Contact Recreation 1; High Aquatic Life
<b>Number of Active Monitoring Stations:</b>	3	<b>Texas Stream Team Monitors:</b>	2	<b>Permitted Outfalls:</b>	25
<b>Description:</b>	Segment 0901 (Tidal Stream): From the confluence with Galveston Bay 1.0 km (0.6 miles) downstream of Tri-City Beach Road in Chambers County to a point 2.2 km (1.4 miles) upstream of IH-10 in Chambers/Harris County.				

Percent of Stream Impaired or of Concern						
Segment ID	PCBs/Dioxin	Bacteria	Dissolved Oxygen	Nutrients	Chlorophyll a	Other
0901	100	100	-	100	100	-

Segment 0901			
Standards	Tidal Stream	Screening Levels	Tidal Stream
Temperature (°C/°F):	35 / 95	Dissolved Oxygen (mg/L) (grab)	4.0
Dissolved Oxygen (24-Hr Average) (mg/L):	4.0	Ammonia-N (mg/L):	0.46
Dissolved Oxygen (Absolute Minima) (mg/L):	3.0	Orthophosphate Phosphorus (mg/L):	0.46
pH (standard units):	6.5-9.0	Total Phosphorus-P (mg/L):	0.66
Enterococci (MPN/100mL) (grab):	104	Chlorophyll a (µg/L):	21
Enterococci (MPN/100mL) (geometric mean):	35		

FY 2016 Active Monitoring Stations				
Site ID	Site Description	Frequency	Monitoring Entity	Parameter Groups
11111	Cedar Bayou at Roseland Park boat ramp	Quarterly	TCEQ	Conventional, Field, Bacteria, Chlorophyll a
11115	Cedar Bayou tidal mid channel 45 M downstream of SH 146 northeast of Baytown	Quarterly	Environmental Institute of Houston (EIH)	Conventional, Field, Bacteria
11117	Cedar Bayou at I-10 eastbound bridge south of Mont Belvieu	Quarterly	EIH	Conventional, Field, Bacteria

**Water Quality Issues Summary**

Issue	2014 Assessment <i>I – Impaired C – Of Concern</i>	Possible Causes / Influences / Concerns Voiced by Stakeholders	Possible Solutions / Actions To Be Taken
<b>Elevated Levels of Indicator Bacteria</b>	Entire Segment I	<ul style="list-style-type: none"> <li>▪ Construction stormwater controls failing</li> <li>▪ Rapid urbanization and increased impervious cover</li> <li>▪ Poorly operated or undersized WWTFs</li> <li>▪ WWTF non-compliance, overflows, and collection system by-passes</li> <li>▪ Improper or no pet waste disposal</li> <li>▪ Developments with malfunctioning or failing OSSFs</li> <li>▪ Animal waste from agricultural production</li> </ul>	<ul style="list-style-type: none"> <li>▪ Adequate construction oversight</li> <li>▪ Improve compliance and enforcement of existing stormwater quality permits</li> <li>▪ Add water quality features to stormwater systems</li> <li>▪ Regionalize chronically non-compliant WWTFs</li> <li>▪ More public education on pet waste disposal</li> <li>▪ Improved OSSF maintenance and education</li> <li>▪ Encourage Water Quality Management Plans or similar projects for agricultural properties</li> <li>▪ Implement stream fencing or alternative water supplies to keep livestock out of or away from waterways</li> </ul>
<b>Dissolved Oxygen Concentrations (Grab)</b>	Entire Segment C	<ul style="list-style-type: none"> <li>▪ Excessive nutrients and organic matter from SSOs, malfunctioning OSSFs, agricultural operations, illegal disposal of grease trap waste, and biodegradable solid waste (e.g., grass clippings and pet waste)</li> <li>▪ Vegetated canopy removed</li> </ul>	<ul style="list-style-type: none"> <li>▪ More public education about proper disposal of household fats, oils, and grease</li> <li>▪ Increase OSSF inspections, maintenance, and repairs</li> <li>▪ More public education regarding OSSF operations and maintenance</li> <li>▪ More outreach to farmers in watershed to minimize fertilizer runoff</li> <li>▪ More public education on pet waste disposal</li> <li>▪ Conserve or restore trees and habitat along waterways to maintain/create vegetated riparian buffer zones</li> </ul>
<b>PCBs/Dioxin in Edible Fish Tissue</b>	Entire Segment I	<ul style="list-style-type: none"> <li>▪ Waste pit located along the San Jacinto River immediately upstream of I-10 bridge is a National Priority List Superfund site managed by EPA</li> <li>▪ Concentrated deposits outside boundaries of the waste pits located adjacent to San Jacinto River and I-10 bridge</li> </ul>	<ul style="list-style-type: none"> <li>▪ Encourage additional testing to locate all unknown sources/deposits</li> <li>▪ Encourage regulators and responsible parties to work together to remediate Superfund site</li> <li>▪ Continue and expand education and outreach efforts to inform the public about the problem and measures they can take to minimize their risk.</li> </ul>

<p><b>Elevated Chlorophyll a Concentrations</b></p>	<p>Entire Segment C</p>	<ul style="list-style-type: none"> <li>▪ Fertilizer runoff from surrounding watershed promote algal growth in waterways</li> <li>▪ Nutrient loading from WWTF effluent, sanitary sewer overflows, and malfunctioning OSSFs promotes algal growth</li> </ul>	<ul style="list-style-type: none"> <li>▪ Improve compliance and enforcement of existing stormwater quality permits</li> <li>▪ Add water quality features to stormwater systems</li> <li>▪ Reduce or manage fertilizer runoff from agricultural areas</li> <li>▪ Support/continue/initiate public education regarding nutrients</li> </ul>
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**Segment Discussion:**

**Watershed Characteristics:** This segment lies in the coastal plain between the Trinity and San Jacinto Rivers and drains directly into Upper Galveston Bay. Large tracts of land in the northwest and east-northeast areas of the segment are dedicated to cultivated crops such as grass farms. Residential development is concentrated in the west central portion and along Texas 146 in the City of Baytown. Large industrial facilities are located primarily along the eastern shoreline of the bayou, but other industrial developments are also scattered throughout the watershed. Barge traffic is prevalent on the lower portion of the segment. Recreational activity, such as boating, is common throughout the segment, although only small boats can go upstream of Texas 146. The heavily industrialized portion of the City of Mont Belvieu is situated in the northeastern corner of the segment.

**Water Quality Issues:** Recreation and fish consumption uses are not supported. The 2014 TCEQ Clean Water Act (CWA) assessment found the geometric mean (geomean) for enterococci was 82.2 MPN/100 mL for the seven-year period ending 11/30/12, more than twice the WQS of 35 MPN/100 mL. H-GAC analysis shows the geomean between 6/1/2001 and 5/31/2008 was 68 MPN/100 mL, and is 122 MPN/100 mL for the seven-year period ending 5/31/15. A plot of [rolling seven-year geometric means](#) suggests that enterococci levels in this watershed increased dramatically after 2013. The 2014 draft lists a concern for aquatic life use support due to low dissolved oxygen (9 samples of 73 below the screening level of 4.0 mg/L during the assessment period). The Texas Department of State Health Services has issued a Limited Consumption Fish Advisory for this water body due to high levels of dioxin in catfish and crab tissue. There are currently no concerns based on high nutrient levels, but there continues to be a chlorophyll a concern. The TCEQ found that 30.8 percent of samples collected during the assessment period exceeded 21.0 µg/L. H-GAC found that 14.5 percent of samples in the seven-year period ending 5/31/15 exceeded that level.

**Special Studies/Projects:** In December 2010, H-GAC began work with the Texas State Soil & Water Conservation Board (TSSWCB) to develop a Watershed Protection Plan (WPP) for Cedar Bayou. Stakeholders used local knowledge and scientific methods to identify solutions for various bacteria sources. Malfunctioning OSSFs, sanitary sewer overflows, and runoff from animal waste were found to be the most prominent sources of bacteria and nutrient loadings to the waterway. The Cedar Bayou WPP is currently in the final approval stages with TSSWCB and the EPA.

**Trends:** Regression analysis of watershed data resulted in six statistically significant water quality parameter trends. Increasing trends for this segment include alkalinity, ammonia, total dissolved solids (TDS), and [total Kjeldahl nitrogen \(TKN\)](#) while decreasing trends were seen for chlorophyll a and Secchi transparency. [Ammonia](#) levels have been increasing since 2008 with concentrations slowly approaching the 0.46 mg/L screening criteria. The same ammonia trends were seen for station 11111 and 11117.

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Although many [chlorophyll a](#) samples collected for this segment are greater than the 21 µg/L screening criteria, a decreasing trend in chlorophyll a has been present since 2008. Finally, increasing TDS and decreasing Secchi transparency over time may reflect an increased contribution of WWTF discharges introducing higher concentrations of dissolved constituents into area waterways.

### Recommendations

Continue collecting water quality data to support actions associated with any future watershed protection plan development and possible modeling.

Finalize watershed protection plan for Cedar Bayou which is currently in the final approval stages with TSSWCB.

Continue to utilize local Clean Rivers Program partners to collect additional data that would help better isolate problem areas.