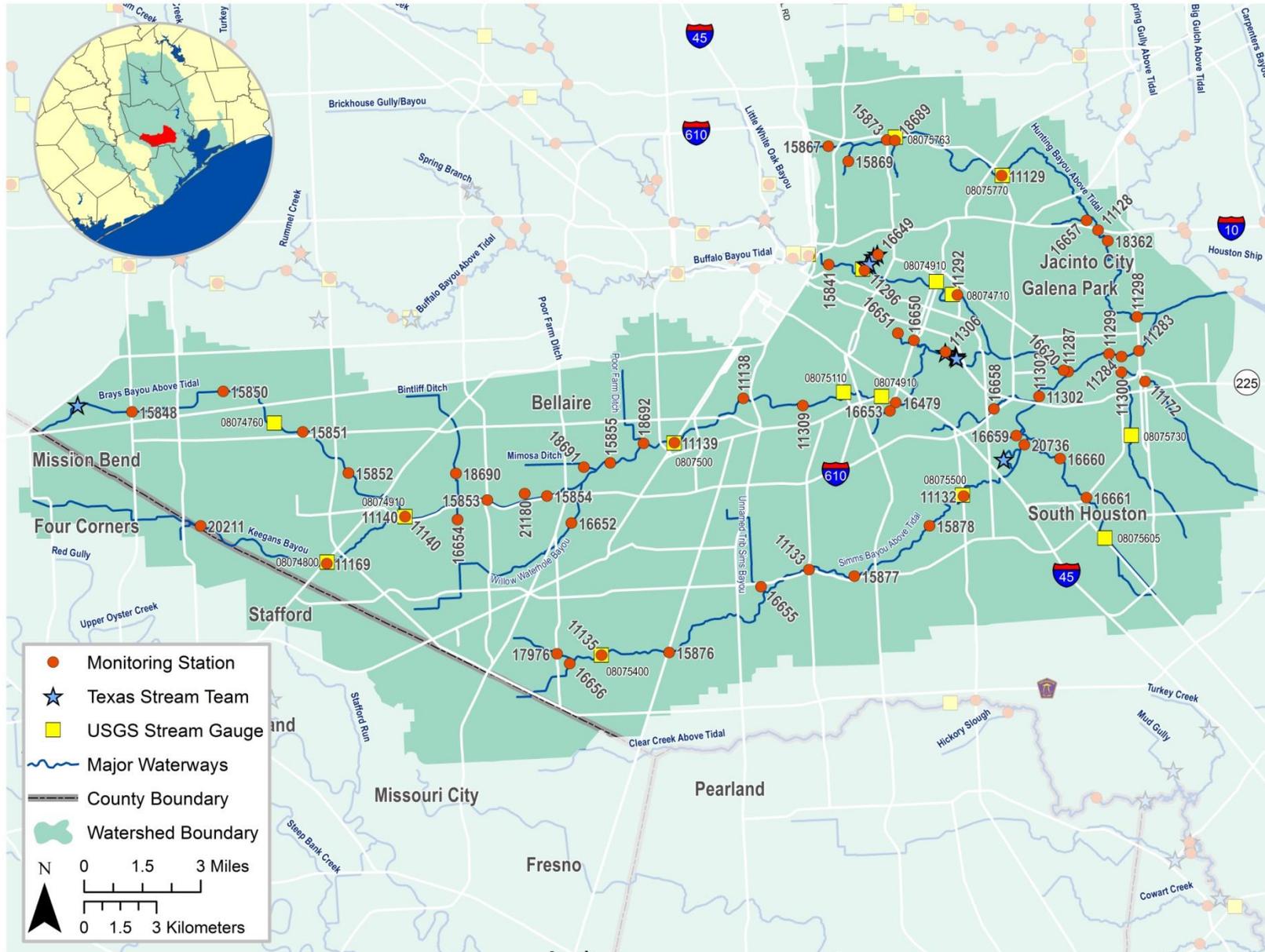
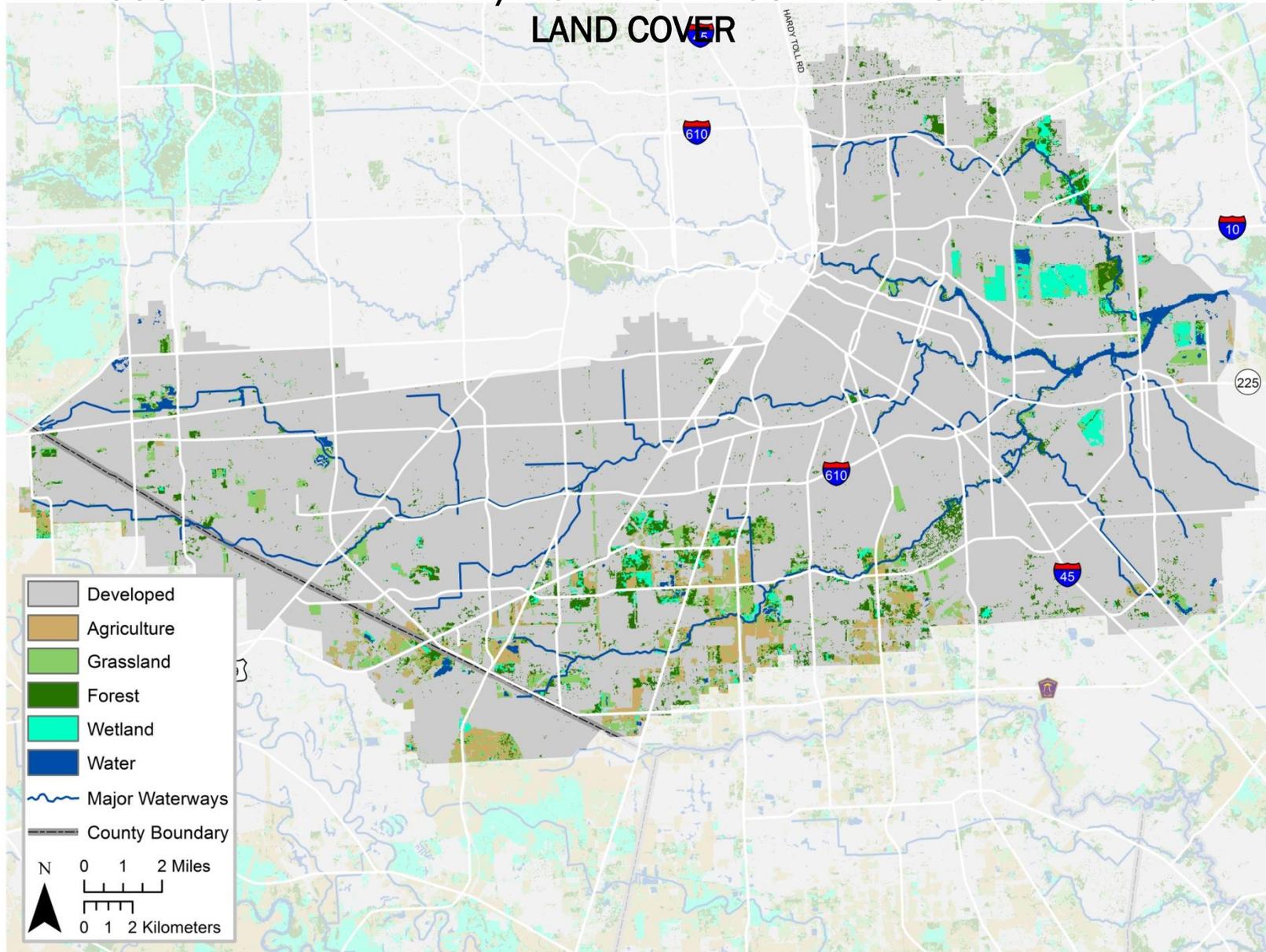
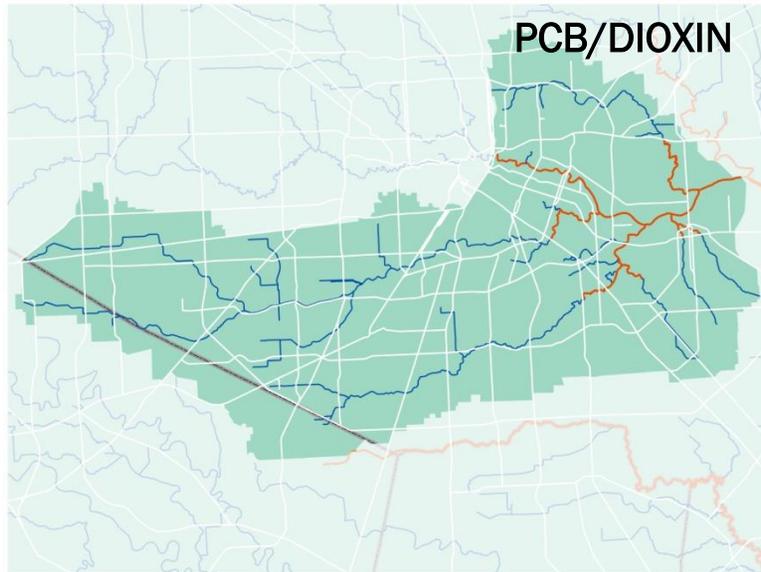
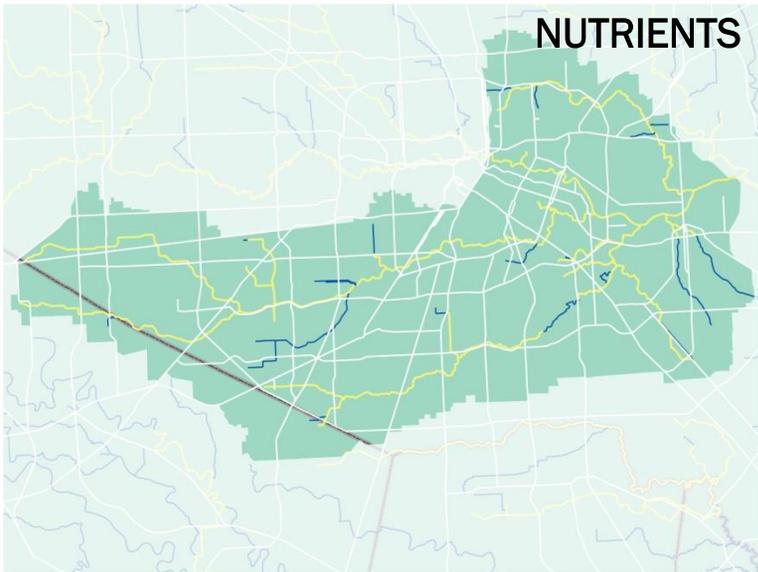
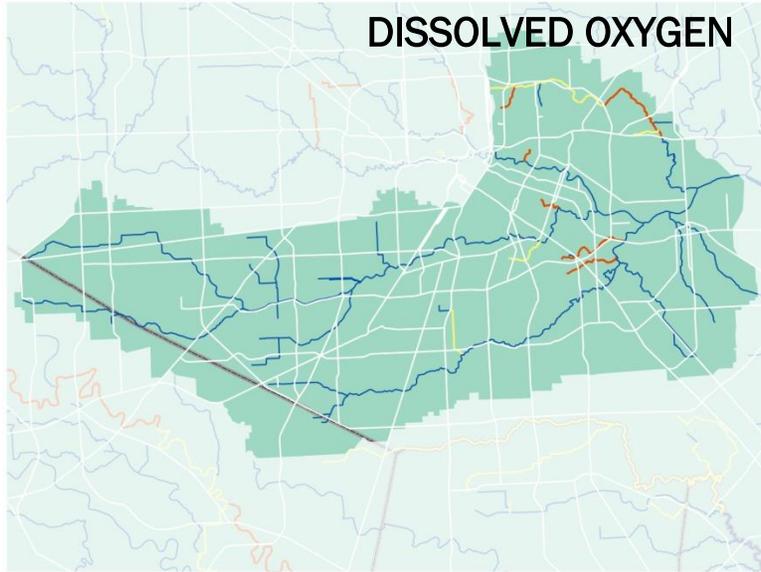
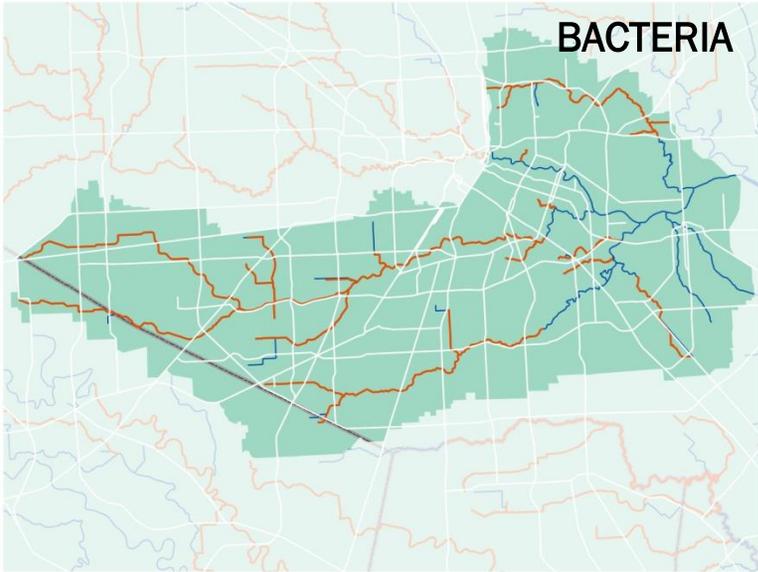


HOUSTON SHIP CHANNEL / BUFFALO BAYOU TIDAL - SEGMENT 1007



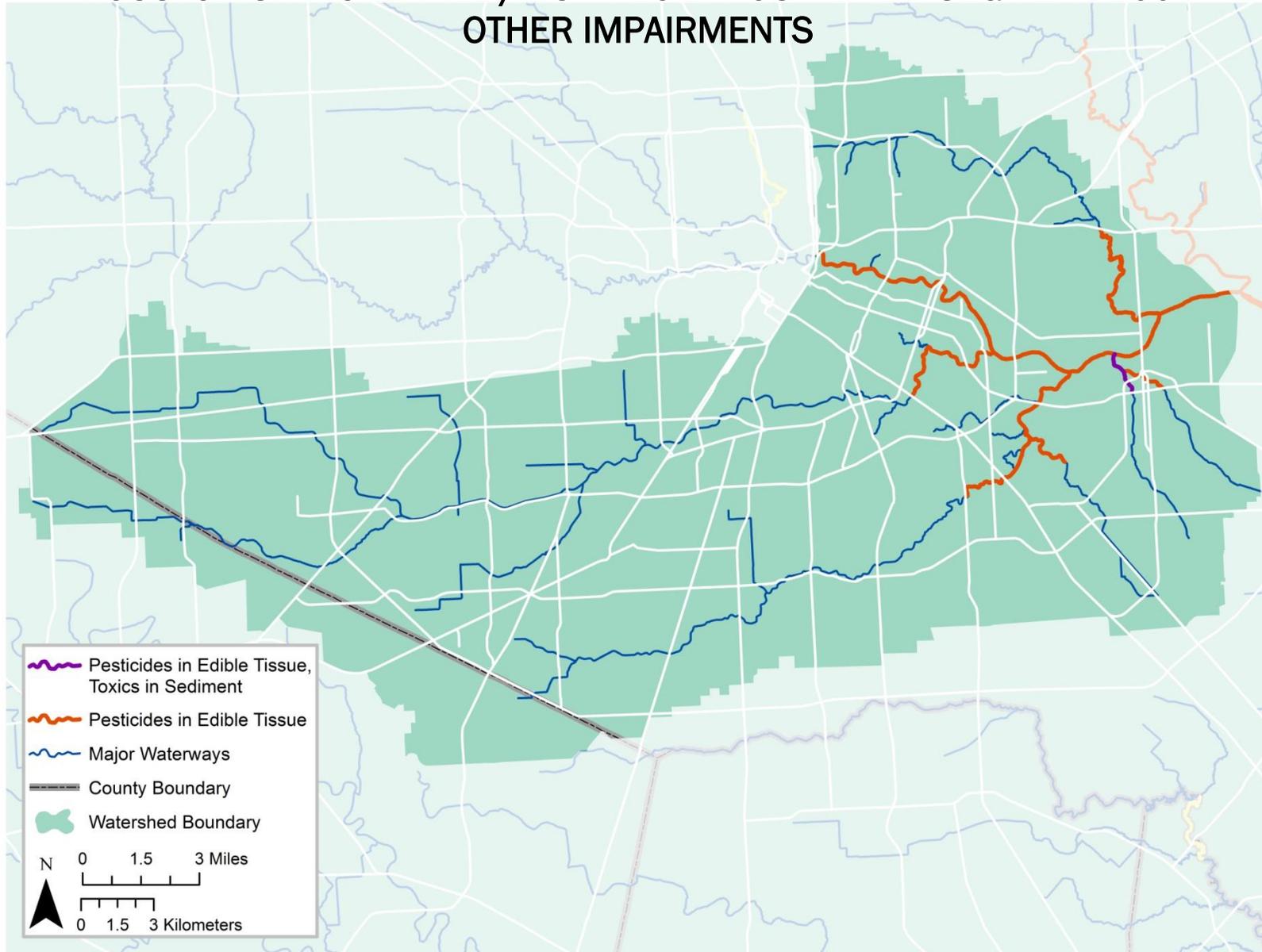
HOUSTON SHIP CHANNEL / BUFFALO BAYOU TIDAL - SEGMENT 1007 LAND COVER





 Impairment  Concern  No Impairments or Concerns

HOUSTON SHIP CHANNEL / BUFFALO BAYOU TIDAL – SEGMENT 1007 OTHER IMPAIRMENTS



Segment Number: 1007		Name: Houston Ship Channel / Buffalo Bayou Tidal			
Length:	32 miles	Watershed Area:	296 square miles	Designated Uses:	Navigation; Industrial Water Supply
Number of Active Monitoring Stations:	59	Texas Stream Team Monitors:	5	Permitted Outfalls:	138
Description:	<p>Segment 1007 (Tidal Stream): From a point immediately upstream of the confluence with Greens Bayou in Harris County to a point 100 meters (110 yards) upstream of US 59 in Harris County, including tidal portion of tributaries</p> <p>Segment 1007A (Perennial Stream w/ limited ALU): Canal C-147 tributary of Sims Bayou Above Tidal (unclassified water body)—From the Sims Bayou confluence upstream to a point 0.71 km (0.44 mi) east of Beltway 8.</p> <p>Segment 1007B (Perennial Stream w/ limited ALU): Brays Bayou Above Tidal (unclassified water body) – From a point 11.5 km (7.1 mi) upstream of confluence with Houston Ship Channel up to SH 6</p> <p>Segment 1007C (Perennial Stream w/ limited ALU): Keegans Bayou Above Tidal (unclassified water body) – From the Brays Bayou confluence to the Harris County line</p> <p>Segment 1007D Perennial Stream w/ limited ALU): Sims Bayou Above Tidal (unclassified water body) – From 11.0 km (6.8 mi) upstream of the Houston Ship Channel confluence to Hiram Clark Drive</p> <p>Segment 1007E (Perennial Stream w/ limited ALU): Willow Waterhole Bayou Above Tidal (unclassified water body) – From the Brays Bayou confluence upstream to South Garden Street (in Missouri City)</p> <p>Segment 1007F (Perennial Stream w/ limited ALU): Berry Bayou Above Tidal (unclassified water body) – From a point 2.4 km (1.5 mi) upstream of the Sims Bayou confluence to the southern city limits of South Houston</p> <p>Segment 1007G (Perennial Stream w/ high ALU): Kuhlman Gully Above Tidal (unclassified water body) – From Brays Bayou confluence to Atchison, Topeka and Santa Fe Railroad tracks in Harris County</p> <p>Segment 1007H (Perennial Stream w/ intermediate ALU): Pine Gully Above Tidal (unclassified water body) –From the Sims Bayou confluence to 0.11 km (0.07 mi) east of Broadway Street in Harris County</p> <p>Segment 1007I (Perennial Stream w/ intermediate ALU): Plum Creek Above Tidal (unclassified water body) –From the Sims Bayou confluence to Telephone Road in Harris County</p> <p>Segment 1007J: Retired segment description</p>				

Segment 1007K (Perennial Stream w/ intermediate ALU): Country Club Bayou Above Tidal (unclassified water body) –From the Brays Bayou confluence to a point 0.43 km (0.27 mi) upstream of Polk Street (above ground portion of the water body)

Segment 1007L (Perennial Stream w/ intermediate ALU): Unnamed Tributary of Brays Bayou (unclassified water body) –From the Brays Bayou confluence near Fondren Road to a point 0.97 km (0.60 mi) upstream in Harris County

Segment 1007M (Perennial Stream w/ intermediate ALU): Unnamed Non-Tidal Tributary of Hunting Bayou (unclassified water body) –From the Hunting Bayou confluence to 0.6 km (0.37 mi) upstream of Gellhorn Road

Segment 1007N (Perennial Stream w/ intermediate ALU): Unnamed Non-Tidal Tributary of Sims Bayou (unclassified water body) –From the Sims Bayou confluence, south of Airport Road to 1.1 km (0.68 mi) upstream of SH 288

Segment 1007O (Perennial Stream w/ intermediate ALU): Unnamed Non-Tidal Tributary of Buffalo Bayou (unclassified water body) –From the Buffalo Bayou confluence to Clinton Drive in Harris County

Segment 1007P: Retired segment description

Segment 1007Q: Retired segment description

Segment 1007R (Perennial Stream w/ intermediate ALU): Hunting Bayou Above Tidal (unclassified water body) –From the Hunting Bayou Tidal confluence at IH-10 upstream to Maury Street on the north fork (east of Elysian Street) and upstream to Bain Street on the south fork

Segment 1007S (Perennial Stream w/ intermediate ALU): Poor Farm Ditch (unclassified water body) From the Brays Bayou confluence upstream 3.6 km (2.3 miles) to the Bissonnet Road bridge crossing

Segment 1007T (Perennial Stream w/ intermediate ALU): Bintliff Ditch (unclassified water body) – From the Brays Bayou confluence upstream 5.8 km (3.6 mi) to the Fondren Road bridge crossing

Segment 1007U (Perennial Stream w/ intermediate ALU): Mimosa Ditch (unclassified water body) – From the Brays Bayou confluence upstream 2.9 km (1.8 miles) to the Chimney Rock bridge crossing

Segment 1007V (Perennial Stream w/ intermediate ALU): Unnamed tributary of Hunting Bayou (unclassified water body) – From the Hunting Bayou confluence to 1.7 km (1.1 mi) upstream of the confluence (0.3 km west of Collingsworth Street)

Percent of Stream Impaired or of Concern						
Segment ID	PCBs/Dioxin	Bacteria	Dissolved Oxygen	Nutrients	Chlorophyll a	Other
1007	100	-	-	100	-	100
1007A	-	100	-	-	-	-
1007B	-	100	-	100	-	-
1007C	-	100	-	100	-	-
1007D	-	84.5	-	84.5	-	-
1007E	-	100	-	-	-	-
1007F	-	100	-	100	-	-
1007G	-	100	100	-	-	-
1007H	-	100	100	100	-	-
1007I	-	100	100	100	-	-
1007K	-	100	100	100	-	-
1007L	-	100	-	100	-	-
1007M	-	100	100	-	-	-
1007N	-	100	100	100	-	-
1007O	-	100	100	100	-	-
1007R	-	100	100	45.9	-	-
1007S	-	100	-	100	-	-
1007T	-	100	-	100	-	-
1007U	-	100	100	-	-	-
1007V	-	100	-	-	-	-

Segment 1007

Standards	Screening Levels	
	Tidal Stream	Perennial Stream
Temperature (°C/°F):	35 / 95	35 / 95
Dissolved Oxygen (24-Hr Average) (mg/L):	1.0	5.0 / 4.0 / 3.0
Dissolved Oxygen (Absolute Minima) (mg/L):	1.0	3.0 / 3.0 / 2.0
pH (standard units):	6.5-9.0	6.5-9.0
Enterococci (MPN/100mL) (30-day geometric mean > 10 samples):	168	
<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
11128	Hunting Bayou downstream of IH-10	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11129	Hunting Bayou at N Loop East	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11132	Sims Bayou at Telephone Road / SH 35	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11133	Sims Bayou at Cullen Blvd	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11135	Sims Bayou at Hiram Clarke Rd	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11138	Brays Bayou at Alameda Road	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11139	Brays Bayou at South Main St	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11140	Brays Bayou at South Gessner	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11169	Brays/Keegan Bayou at Roark Rd	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11172	Little Vince Bayou at North Main Street	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11283	Houston Ship Ch Washburn Tunnel	Monthly	HCPHES	Field, Conventional, Bacteria
11284	HSC/Buffalo Bayou near FL 165	Quarterly	TCEQ	Field, Conventional, Bacteria, Chlorophyll a
11287	Houston Ship Channel / Buffalo Bayou at confluence with Sims Bayou	Quarterly	TCEQ	Field, Conventional, Bacteria, Chlorophyll a
11292	Houston Ship Channel / Buffalo Bayou in Turning Basin	Monthly	HCPHES	Field, Conventional, Bacteria, Chlorophyll a (Qtrly)
11292	Houston Ship Channel / Buffalo Bayou in Turning Basin	Quarterly	TCEQ	Field, Conventional, Bacteria, Chlorophyll as
11292	Houston Ship Channel / Buffalo Bayou in Turning Basin	Twice / Year	TCEQ	Metals in Water
11292	Houston Ship Channel / Buffalo Bayou in Turning Basin	Once / Year	TCEQ	Metals & Organics in Sediment
11296	Buffalo Bayou at Hirsch Road	Quarterly	TCEQ	Field, Conventional, Bacteria, Chlorophyll a
11298	Hunting Bayou at Federal Road	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11299	Vince Bayou at HSC confluence	Quarterly	TCEQ	Field, Conventional, Bacteria, Chlorophyll a
11299	Vince Bayou at HSC confluence	Twice / Year	TCEQ	Metals in Water
11299	Vince Bayou at HSC confluence	Once / Year	TCEQ	Metals & Organics in Sediment
11300	Vince Bayou at North Richey St	Quarterly	TCEQ	Field, Conventional, Bacteria, Chlorophyll a
11302	Sims Bayou Tidal at Lawndale	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11302	Sims Bayou Tidal at Lawndale	Quarterly	TCEQ	Field, Conventional, Bacteria, Chlorophyll a
11304	Sims Bayou at Galveston Road	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11306	Brays Bayou Tidal at 75th St	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
11306	Brays Bayou Tidal at 75th St	Quarterly	TCEQ	Field, Conventional, Bacteria, Chlorophyll a
11309	Brays Bayou at Scott St	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
15841	Buffalo Bayou Tidal at Jensen	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria

15848	Brays Bayou at SH 6	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
15850	Brays Bayou at Dairy Ashford	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
15851	Brays Bayou at Wilcrest Drive	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
15852	Brays Bayou at Beechnut Street	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
15853	Brays Bayou at Hillcroft St	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
15854	Brays Bayou at S Rice Avenue	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
15855	Brays Bayou at Stella Link Rd	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
15867	Hunting Bayou at Jensen Drive	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
15869	Hunting Bayou at Cavalcade St	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
15873	Hunting Bayou at Lockwood Dr	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
15876	Sims Bayou at Alameda Road	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
15877	Sims Bayou at M L King Jr Blvd	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
15878	Sims Bayou at Swallow Street	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16479	Brays Bayou at South Wayside	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16620	HSC/Buffalo Bayou at Mayo Shell Rd	Monthly	HCPHES	Field, Conventional, Bacteria
16649	Trib Of Buffalo Bayou at Clinton	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16650	Country Club Bayou at Wayside	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16651	Country Club Bayou at Hughes	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16652	Willow Waterhole at McDermed Dr	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16653	Kuhlman Gully at Brock St	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16654	Trib of Brays Bayou at Dumfries	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16655	Trib of Sims Bayou at Dulcimer	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16656	Sims Bayou S Branch at Tiffany	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16657	Unnamed Tributary of Hunting Bayou immediately upstream of John Ralston Road	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16658	Plum Creek at Old Galveston Rd	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16659	Pine Gully at Old Galveston Rd	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16660	Berry Bayou at Ahrens Drive	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
16661	Berry Bayou at South Richey	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
17976	Sims Bayou at S Post Oak Rd	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
18362	Hunting Bayou at Market St	Quarterly	TCEQ	Field, Conventional, Bacteria, Chlorophyll-a
18689	Trib Hunting Bayou at Minden	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
18690	Bintliff Ditch at Bissonnet St	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
18691	Mimosa Ditch at Newcastle Dr	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
18692	Poor Farm Ditch at N Braeswood	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria

20211	Keegan's Bayou at Synott Road	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
20736	Sims Bayou at Galveston Rd	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria
21180	HCFCD Channel D138/Chimney Ditch immediately upstream of Caversham Dr	Nine Times / Year	COH / HHS	Field, Conventional, Bacteria

Water Quality Issues Summary

Issue	2014 Assessment <i>I - Impaired</i> <i>C - Of Concern</i>	Possible Causes / Influences / Concerns Voiced by Stakeholders	Possible Solutions / Actions To Be Taken
Elevated Levels of Indicator Bacteria	1007A	<ul style="list-style-type: none"> ▪ Constructed stormwater controls failing 	<ul style="list-style-type: none"> ▪ Improve compliance and enforcement of existing stormwater quality permits
	1007B	<ul style="list-style-type: none"> ▪ Rapid urbanization and increased impervious cover 	<ul style="list-style-type: none"> ▪ Improve construction oversight to minimize TSS discharges to waterways
	1007C		
	1007D	<ul style="list-style-type: none"> ▪ Waste haulers illegal discharges/improper disposal 	<ul style="list-style-type: none"> ▪ Add water quality features to stormwater systems
	1007E		
	1007F	<ul style="list-style-type: none"> ▪ Direct and dry weather discharges 	<ul style="list-style-type: none"> ▪ Install and/or conserve vegetative buffer areas along all waterways
	1007G	<ul style="list-style-type: none"> ▪ Poorly operated or undersized WWTFs 	<ul style="list-style-type: none"> ▪ Increase monitoring requirements for self-reporting
	1007H	<ul style="list-style-type: none"> ▪ WWTF non-compliance, overflows, and collection system by-passes 	<ul style="list-style-type: none"> ▪ Regionalize chronically non-compliant WWTFs
	1007I		
	1007K	<ul style="list-style-type: none"> ▪ Improper or no pet waste disposal 	<ul style="list-style-type: none"> ▪ Require all systems to develop and implement a utility asset management program and protect against power outages at lift stations
	1007L	<ul style="list-style-type: none"> ▪ Developments with malfunctioning OSSFs 	
	1007M	<ul style="list-style-type: none"> ▪ Animal waste from hobby farms and riding stables 	<ul style="list-style-type: none"> ▪ Impose new or stricter bacteria limits than currently designated by TCEQ
	1007N		
	1007O		
	1007R		<ul style="list-style-type: none"> ▪ More public education on pet waste disposal
	1007S		<ul style="list-style-type: none"> ▪ Ensure proper citing of new or replacement OSSFs
	1007T		<ul style="list-style-type: none"> ▪ Increase monitoring and enforcement efforts to identify and repair failing OSSFs
1007U		<ul style="list-style-type: none"> ▪ More public education regarding OSSF operation and maintenance 	
1007V		<ul style="list-style-type: none"> ▪ Encourage Water Quality Management Plans or similar projects for agricultural properties 	
		<ul style="list-style-type: none"> ▪ Implement stream fencing or alternative water supplies to keep livestock out of or away from 	

			waterways	
Dissolved Oxygen Concentrations	1007G	C	<ul style="list-style-type: none"> ▪ 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) ▪ Excessive nutrients and organic matter from agricultural production and related activities ▪ Vegetative canopy removed ▪ High temperature discharges from industrial WWTFs 	<ul style="list-style-type: none"> ▪ Improve compliance and enforcement of existing stormwater quality permits ▪ Improve operation and maintenance of existing WWTF and collection systems ▪ More public education regarding disposal of household fats, oils, and grease ▪ More public education on pet waste disposal ▪ Improved OSSF maintenance and education ▪ Regionalize chronically non-compliant WWTFs ▪ Install and/or maintain riparian buffer areas between agricultural fields and waterways ▪ Encourage Water Quality Management Plans or similar projects for agricultural properties ▪ Conserve or restore trees and habitat along waterways to maintain/create shade to cool water ▪ Work with drainage districts and agencies to change practices of clear cutting and channelizing waterways to protect from solar heating
	1007H	I		
	1007I	I		
	1007K	I		
	1007M	C		
	1007N	C		
	1007O	I		
	1007R	I		
	1007U	C		
Elevated Nutrients	1007	C	<ul style="list-style-type: none"> ▪ Fertilizer runoff from urbanized properties, such as landscaped areas, residential lawns, and sport fields ▪ Agricultural runoff from row crops, fallow fields, and animal operations ▪ WWTF effluent, SSOs, and malfunctioning OSSFs 	<ul style="list-style-type: none"> ▪ Implement YardWise and Watersmart landscape practices ▪ Install and/or maintain riparian buffer areas between agricultural fields and waterways ▪ Encourage Water Quality Management Plans or similar projects for agricultural properties ▪ Monitor phosphorus levels at WWTFs to determine if controls are needed
	1007B	C		
	1007C	C		
	1007D	C		
	1007F	C		
	1007H	C		
	1007I	C		
	1007K	C		
	1007L	C		
	1007N	C		
	1007O	C		
	1007R	C		
	1007S	C		
	1007T	C		

<p>PCBs/Dioxin and Pesticides in Edible Fish Tissue (Chlordane, Dieldrin, & Heptachlor)</p>	<p>1007 I</p>	<ul style="list-style-type: none"> ▪ Legacy pollutant in sediment ▪ Waste pit located along the San Jacinto River immediately upstream of I-10 bridge ▪ Concentrated deposits outside boundaries of the waste pits located adjacent to San Jacinto River and I-10 bridge ▪ Spills from chemical manufacturing processes/ storage and transport along the channel ▪ Unknown industrial or urban sources ▪ Agricultural runoff from row crops ▪ Spill of pesticides in urbanized areas 	<ul style="list-style-type: none"> ▪ Encourage regulators and responsible parties to work together to remediate Superfund site ▪ Remove or contain contamination from locations already identified ▪ Encourage additional testing to locate all unknown sources/deposits ▪ Install and/or maintain riparian buffer areas between agricultural fields and waterways ▪ Encourage Water Quality Management Plans or similar projects for agricultural properties
<p>Elevated Heavy Metals in Sediment (Iron)</p>	<p>1007 I</p>	<ul style="list-style-type: none"> ▪ Discharges from domestic, agricultural, or industrial sources ▪ Build up in pipelines, pressure tanks, water heaters, and water softeners from industrial point sources ▪ Dissolution from natural deposits ▪ Particles deposition and re-suspension processes due to dredging processes or tidal movements 	<ul style="list-style-type: none"> ▪ Increase monitoring and enforcement efforts to identify and control industrial point sources ▪ Encourage additional testing to locate all unknown sources/deposits

Segment Discussion

Watershed Characteristics: This very urbanized watershed includes 14 miles of the Houston Ship Channel (HSC) but more than 70 miles of tidal and non-tidal tributary streams. The HSC is lined by heavy industrial complexes located in the City of Pasadena, Galena Park, Houston, and unincorporated Harris County. Numerous permitted wastewater and storm water discharges are located throughout the watershed. The HSC supports heavy boat and barge traffic from Greens Bayou upstream to the turning basin on a continual basis. The Cities of Pasadena and South Houston are drained primarily by Vince Bayou, Little Vince Bayou and Berry Bayou, while the two largest tributaries – Sims and Brays Bayous – drain the City of Houston and a host of smaller cities and unincorporated communities to the west. About half of the watershed supports low intensity residential and commercial development while the rest is a mixture of high intensity development, grasslands and pockets of forested areas. Not all areas are serviced by sanitary sewer despite the numerous wastewater collection and treatment systems located throughout the watershed.

Water Quality Issues: None of the four uses designated to Houston Ship Channel/Buffalo Bayou Tidal - aquatic, recreation, fish consumption, and general - are fully supported. All the Assessment Units (AU) located on the classified portion of the channel are listed as impaired in the 2014 IR for fish consumption due to high levels of dioxin/PCBs and several pesticides (Chlordane, Dieldrin, and Heptachlor). Due to the high levels found in this segment, the Texas Department of State Health Services has issued a Limited Consumption Fish Advisory for this water body. Recreational use of the main channel of segment 1007 is prohibited. None of the tributaries to 1007 support their designated recreation use due to elevated levels of *E. coli*. Details of *E. coli* geometric means and grab standard exceedances over time for impaired unclassified tributaries are 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
1007B_01	1873	3112 / 93.8	1437 / 85.0
1007B_02	1059	856 / 65.7	585 / 52.5
1007C_01	907	1613 / 91.0	750 / 63.7
1007D_01	252	562 / 62.2	291 / 43.4
1007D_02	921	1499 / 84.5	918 / 67.7
1007D_03	933	1346 / 83.2	1104 / 75.7
1007E_01	812	1314 / 75.7	670 / 54.8
1007F_01	2492	2062 / 93.2	2676 / 85.2
1007G_01	1352	785 / 54.8	1166 / 69.4
1007H_01	1221	2422 / 86.5	1436 / 78.3
1007I_01	3763	4251 / 90.5	2909 / 81.7
1007K_01	1458	3012 / 82.1	1416 / 75.8
1007L_01	460	696 / 70.4	497 / 53.2
1007M_01	375	640 / 59.5	379 / 41.9
1007N_01	576	709 / 63.0	375 / 45.2
1007O_01	1521	1813 / 78.4	474 / 54.1
1007R_01	2625	10038 / 93.2	1742 / 74.2
1007R_02	244	475 / 58.1	205 / 34.4
1007R_03	361	402 / 50.0	339 / 47.2
1007R_04	600	658 / 63.9	2274 / 82.0
1007S_01	1420	2072 / 80.6	739 / 66.1
1007T_01	4208	10189 / 100.0	2005 / 80.6
1007U_01	2891	3980 / 100.0	1841 / 80.3
1007V_01	345	532 / 67.7	281 / 40.3

Although the level of *E. coli* in this watershed is quite high, they appear to be falling over time in most unclassified waterbodies. This can be seen in the rolling seven-year geometric mean plots for segments [1007B](#) and [1007D](#).

Levels of Dissolved Oxygen (DO) measured during 24-hour DO monitoring confirmed impairments in AU 1007H_01, 1007I_01, 1007K_01, 1007O_01 and 1007R_01. The 2014 IR identified aquatic life concerns due to low DO in grab samples in AU 1007G_01, 1007H_01, 1007I_01, 1007K_01, 1007M_01, 1007N_01, 1007O_01, 1007R_01, 1007R_02, 1007R_03, 1007R_04, 1007U_01, and 1007A_01. The mean 24-hour DO also supported concerns in 1007K_01 and 1007_R04, but insufficient data was obtained to confirm impairment. There are multiple nutrient concerns in the watershed. Of the 34 AUs, 19 are listed for ammonia concerns, 18 for nitrate-nitrogen(nitrate), and 15 for total phosphorus(TP). Details can be found in summary tables in the appendix of this report.

Special Studies/Projects: This segment has been included in three TMDL projects: the Houston Metro TMDL for bacteria, the Houston Ship Channel and Upper Galveston Bay TMDL for PCBs in fish tissue and the Houston Ship Channel TMDL for Dioxin. This segment is also part of a larger geographic area covered under several TMDLs, collectively known as the Bacteria Implementation Group (BIG) I-Plan. For more information, please refer to the detailed discussions located in the Public Involvement and Outreach section of the 2016 Basin Summary Report regarding dioxin and PCB contamination and the BIG.

Trends: Analysis of watershed data revealed trends for each of the parameters selected for analysis at one or more AUs within the watershed. This discussion will focus on the most common water quality parameter trends and those associated with impairments and concerns listed in the 2014 Integrated Report. Currently, the HSC/Buffalo Bayou Tidal watershed has a bacteria impairment and a concern for nutrients present for the majority of classified and unclassified tributaries within its boundaries. Enterococci are the indicator bacteria in most of the AUs in the classified portion of the water body while *E.coli* is the indicator bacteria for the above tidal tributaries within the watershed. Regression analysis of bacteria data revealed decreasing trends over time for [1007B](#), 1007L, 1007N, 1007O, 1007T, and 1007U. [Moving seven-year bacteria geometric means](#) show a gradual decline in bacteria since 2005 for the main segment even though the overall geometric means still exceed the set water quality standards. Bacteria levels have remained [relatively stable](#) in all other AUs within the watershed; however, significant reductions in bacteria are still necessary to meet state water quality standards for *E. coli* and/or enterococci for all AUs. Additionally, regression analysis of ammonia concentrations detected a decreasing trend in 12 out of the 17 AUs within the HSC/Buffalo Bayou Tidal watershed. The decreasing/stable bacteria levels along with an overall reduction in ammonia during the period of record are likely related to the implementation of best management practices developed by the BIG including improved stormwater controls and wastewater treatment.

Nutrient trends throughout the watershed vary depending on segment location. Nitrate and TP are seeing increasing trends on the main segment as well as on Brays Bayou, Keegans Bayou, Sims Bayou, Berry Bayou, and Poor Farm Ditch. [Brays Bayou](#) and [Sims Bayou](#) show the most significant increases in nutrient levels with concentrations sporadically reaching more than five times the set screening criteria. The majority of remaining AUs in the watershed revealed gradual decreasing trends in nitrate and TP over time. Variations in nutrient concentrations are highly dependent on segment and station location due to the sheer number of point and non-point sources of pollution present throughout the watershed. However, likely nutrient sources include runoff from highly urbanized areas and wastewater treatment facility (WWTF) discharges.

DO impairments and concerns are present for nine segments within the watershed. Regression analysis of DO data revealed statistically significant trends

for nine out of the 17 assessment units; however, only two of these assessment units are designated as impaired or of concern for DO. Segment 1007N is currently listed in the 2014 Integrated Report as having a concern for DO. Regression analysis revealed a [gradual improvement in DO](#) levels over time at this location. Plum Creek, 1007I, is the only AU where [DO concentrations are degrading](#) during the period of record. Plum Creek runs parallel to Interstate 610 and intersects Interstate 45 at monitoring station 16658. Depleting DO concentrations at this station are likely related to runoff from the highly urbanized development surrounding Plum Creek.

Additionally, [pH levels are trending upward](#) in 12 out of the 17 AUs in the watershed, the majority of which are gradually approaching the upper limit of the pH standard of 9.0 mg/L. Upper limit exceedances have become more frequent during sampling events occurring after 2011. Reasons for increased pH levels are unknown at this time. Additional station level characterizations and data analysis are necessary to better evaluate what is causing the water to become increasingly more alkaline over time.

Recommendations

Address concerns found in this segment summary through stakeholder participation, including the BIG.

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