

Water Quality

Uses:

- Contact Recreation
- High Quality Aquatic Life

Monitoring Agencies:

- City of Houston Health and Human Services
- City of Houston Public Works and Engineering (historical)
- Texas Natural Resource Conservation Commission
- United States Geological Survey (flow)

Oxygen in the water is important to aquatic life. Generally, dissolved oxygen levels of five milligrams per liter (mg/l) (or higher) are considered good for aquatic organisms. Fish populations can still be supported, although they will be stressed, at levels as low as three mg/l. Temperature affects the quality of aquatic life and also dictates the amount of oxygen that can be contained in water.

Bacteria counts are important when evaluating a waterbody's suitability for contact recreation, such as swimming. Fecal coliform densities below 400 colonies/100 milliliters (ml) of water are considered acceptable. The Texas Natural Resource Conservation Commission has started using *E. Coli* (freshwater) and *Enterococcus* (tidal

waterbodies) as bacterial indicators. However, until there is enough *E. Coli* or *Enterococcus* data to assess waterbodies, monitoring agencies will continue to collect fecal coliform data simultaneously.

Throughout the watershed, the temperature/dissolved oxygen relationship appears to be satisfactory. Dissolved oxygen values commonly range between four mg/l and eight mg/l, which are adequate for healthy fish populations and other aquatic organisms.

Bacteria counts throughout the watershed are high, impairing its use for contact recreation. Typically, these densities are higher after rainstorms, which wash bacteria from many sources into area waterways. Fecal coliform numbers usually decline rapidly after a rainfall, unless there is a continuous source of bacteria present, such as a leaking septic tank or sewer line.

There are also nutrient enrichment concerns throughout the watershed. Elevated levels of nitrates and phosphates can create algal blooms that deplete the water of dissolved oxygen and prevent sunlight from reaching aquatic vegetation. Excessive levels of ammonia, a more prevalent concern in the watershed, can have a negative impact on the health of aquatic life. These issues also affect the recreational value of the waterbody.

Sources of nitrogen and ammonia include sewage, excess fertilizers and animal waste washed off during heavy rain events, decomposing plant debris, and atmospheric deposition. Phosphorus is mainly transported by attaching itself to sediment particles. Phosphorus sources include animal waste runoff, sewage treatment plant discharge, industrial processing discharge, and sediment runoff from agricultural areas and mining activities.



Parks Key - 1 Townwood 2 Scottcrest 3 Sunnyside 4 Sims Bayou Vista 5 Stuart Park 6 Reveille Park 7 Glenbrook Park 8 Milby Park

Flood Control

Due to the geography of the region, Houston area residents have always coped with flooding. The humid subtropical climate, which is heavily influenced by the Gulf of Mexico, produces an average of 46 inches of rain per year. The region's relatively flat terrain, with moderately impermeable to highly impermeable soils, provides wide, natural floodplains for most of the baysous that flow across the landscape on their way to Galveston Bay.

Flooding of property has been a major problem for residents along the bayou for decades. In 1990, the U. S. Army Corps of Engineers (COE) began work on a flood damage reduction project along the 19.3 miles of the Sims Bayou channel from its mouth upstream to Croquet Street, just west of South Post Oak. This project, when complete, will provide protection from a 25-year flood, which statistically has a 4%

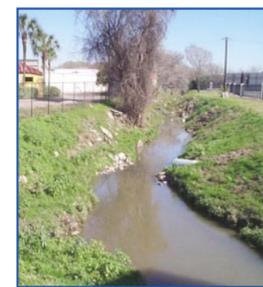
chance of occurring each year. The project will also remove approximately 35,000 homes and 2,000 commercial structures from the 100-year floodplain, the area of land adjacent to the main channel that statistically has a 1% chance of flooding each year. The plan to reduce flooding along the bayou also includes, widening and other adjustments to the channel, along with erosion control measures and environmental features. The Harris County Flood Control District (HCFCD) serves as the local sponsor of the project.

While the COE's role is to manage, designs, and build the project, the HCFCD is responsible for buying land, easements, and rights of way in the floodplain, as well as for relocating utilities, adjusting bridges (except for railroads), and operating and maintaining the channel after completion of the project. The HCFCD has already purchased land totaling 700 acres to be used for three detention basins in the

upper portion of the watershed as part of its regional plan. These detention basins collect and store stormwater temporarily during severe storm events in order to diminish both the amount and the velocity of the water flowing through the channel. These basins also serve as multipurpose facilities. Some of the land is sub-leased for equestrian facilities and park recreation amenities that can be utilized while the basin is not storing floodwater.



flood detention



New Environmental Features and Design Projects Used to Enhance the Flood Damage Reduction Plan

The Channel Banks

The channel was widened and partial flood benches (cut out "shelves" within the channel) were created. The shelves allow the channel to be wider at certain points in order to accommodate more water during heavy rain events. By creating these flood benches, fourteen trees per acre can be replanted without hindering flow. Rather than lining the channel with solid concrete, the COE used open-celled concrete mats along the channel bottom and lower slopes, which allow vegetation to grow while providing erosion control.

Fish Pools

The project design includes man-made instream pools to provide variation in water depth. Pools of deeper water are cooler and less turbulent. The sequences of various water depths promote good water quality and create a healthy instream habitat for fish and other wildlife, including aquatic insects, which can reveal water quality characteristics just by their presence or absence.



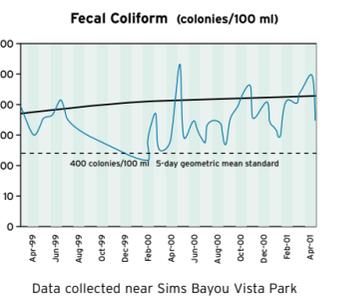
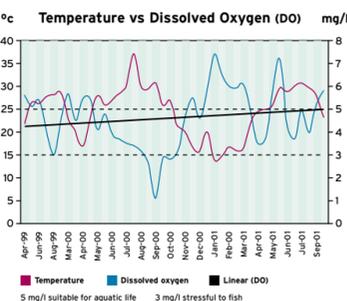
concrete matting

Two types of fish pools have been established along the bayou. In the area just west of SH 35, earthen-bottomed pools were constructed along a small portion of the oxbow cutoffs, outside of the main channel. Because these pools were confined to a small space on the oxbows, width and depth was greatly minimized.

Due to soil conditions, concrete-lined pools have been constructed along the entire reach of the federal project. The pools' average size is approximately 100 feet long and approximately seven feet deep, depending on the location. The pools are strategically located to allow for the flushing of fresh water into the hydrologic system.

Bioengineering

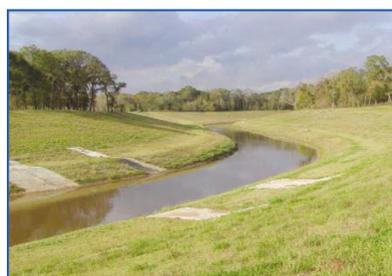
Relatively new to this area, an alternative method of slope stabilization is being tested in the Sims Bayou Federal Project. Bioengineering is the combination of biological, mechanical, and ecological tools used to control erosion and stabilize soil. By staking trunks and limbs of trees ("wattles"), along with a variety of other plant species, into eroding slopes, bioengineering is aimed at creating a living network of interwoven vegetation. New vegetation will grow from the nodes of these living limbs to create a natural lattice. This accomplishes several goals, including slope stability, erosion protection, and habitat enhancement. The first test site on Sims Bayou was planted in the Sims Woods Conservation Area in March 2002. The COE will be monitoring the status of this project to see if the technique may be able to be implemented in other locations.



Data collected near Sims Bayou Vista Park

Watershed Profile

Area	94 square miles
Rainfall	Average annual 46"
Elevation	21' - 58'
Geology	Sedimentary formations consisting of materials deposited by water during the Pleistocene
Soils	Somewhat poorly drained, very slowly permeable, clay and loam soils, local sandy areas and clay and sandy areas
Major Ecoregion	Western Gulf Coastal Plain
Subregion	Gulf Coast Prairies and Marshes
Natural Region	Oak Prairies and Woods
Vegetation	Coastal Short Grass Prairie
Cities	Houston South Houston Missouri City Stafford
Tributaries	Plum Creek Pine Gully Berry Bayou
Aquifers	Gulf Coast
Issues	Flooding/high moisture retention at surface due to nature of soils Water quality (bacteria and ammonia) Loss of native habitat Erosion



No matter where we live or work, we are always in a watershed – an area of land that drains to a particular creek, river, bayou or lake. As our population grows, so do the risks to our waterways from activities in the watershed. Understanding our role in watershed management is key to the protection of our waterways, floodplains, and Watershed drinking water, plus our recreational and fishing areas.

Conservation - Sims Woods



The Sims Woods Conservation Area (SWCA) is located next to the bayou, between West Bellfort and Hemingway, and includes two remnant oxbows, or abandoned meanders of the bayou. The oxbow features were created after the channel was straightened. The Sims Bayou Coalition requested the preservation of this natural area to protect the remaining woodland vegetation and wildlife as well as to enhance the aesthetic qualities. The earthen fish pools and bioengineering test sites can be observed in the SWCA. The conservation area will also serve as an educational resource for schools and neighborhood residents.



Trees and Grasses

Several mature stands of coastal floodplain hardwood forests, along with woody shrubs and smaller trees serving as understory, are found in this reach of Sims Bayou and provide tree canopy for portions of the conservation area. There is a need for invasive species control for such trees as the Chinese Tallow and the Chinese Privet. Birds, wind, and water transport seeds from these exotics and contribute to their spread. In disturbed areas of the natural landscape, invasive species have the potential to crowd out native species, through root or canopy competition, and dominate that area, destroying the vegetation that once provided habitat for a large variety of native wildlife. Members of the Sims Bayou Coalition, as

part of a habitat restoration plan, have planted native trees and shrubs inside one of the oxbows. Some areas in the floodplain must be kept free of trees in order for floodwaters to pass efficiently. While some flood benches will allow for the planting of 14 trees per acre, native grasses will be planted in those areas that need to be kept free from tree cover.

Wetlands

Wetlands are found in the remnant oxbows as well as in depressions in upland wooded areas. These areas provide critical spawning habitat for fish, frogs, and turtles, and protect against the scouring action of high velocity stormwater runoff.

Wildlife

The various grasses and tree canopy within the SWCA provides food and shelter for a variety of wildlife species, with little influence from visitors. Wading birds and raptors can be found in high tree branches. Songbirds make their home in the thickets and tall grasses, and migrating warblers and wintering sparrows nest in the Giant Ragweed. The weedy habitat provides cover for caterpillars and adult butterflies. Woodpeckers will be at home in decaying wood fit for roosting. The natural breakdown of old trees and limbs will also provide habitat for many other small animals such as opossums and raccoons as well as insects. Pools in the oxbow wetlands provide habitat for turtles and other aquatic species.

Parks/Green Belt



The amount of land dedicated to parks and open space is key to determining quality of life. Parks are not just a place to play, but they also provide flood mitigation, nature preservation, and improve air quality.

There are small neighborhood parks, along with several large parks, scattered through the Sims Bayou watershed. Sims Bayou, as well as many of the tributaries and drainage ditches, flows through or adjacent to many of these parks.

The Sims Bayou Federal Flood Control Project includes recreational development, which is currently planned to contain 14 miles of hike and bike trails with connections to parks. The upstream trail head will begin at Croquet Street, where there are two existing trails that reach Townwood Park. From there, new facilities will be built along the bayou to the downstream trail head, which will be east of IH-45, just upstream of Glenbrook Park. The City of Houston currently plans to be the sponsor of this development. Construction of recreational features will be implemented in phases in the future.

The "Greenbelt Trail System" amenities currently planned will be constructed along the bayou and in the mid-reach detention basin. Trails will meander along the banks of the bayou, and pedestrian bridges will be built for access across the main channel as well as across some tributaries. The Greenbelt trails will link six parks and several schools and neighborhoods. New facilities such as picnic areas, exercise stations, benches and water fountains are scheduled to be included in the parks linked by the trails.

This trail system along the bayou will enhance the area while providing flood damage reduction to thousands of residents of the Sims Bayou watershed. The multipurpose trails and parks will provide recreational opportunities for the health and enjoyment of the public.

Contacts

For more information on your watershed, please contact the following:

Bayou Preservation Association
(713) 529-6443
www.bayoupreservation.org

Harris County Flood Control District
(713) 684-4000

Houston-Galveston Area Council
(713) 627-3200
www.hgac.cog.tx.us

Sims Bayou Coalition
(713) 644-8228

Sims Bayou Urban Nature Center
(713) 640-2407

Texas Natural Resource Conservation Commission
(512) 239-4491
www.tnrcc.state.tx.us



Photographs courtesy of Harris County Flood Control District and Houston-Galveston Area Council, and U.S. Army Corps of Engineers 07/02

Sims Bayou is one of the major tributaries of the Houston Ship Channel/ Buffalo Bayou. The bayou is tidally influenced up to a point near Swallow Street in Houston. The watershed is part of the San Jacinto

Sims Bayou Watershed

River Basin and is largely a mixture of urban and residential development, though there are large acreages of undeveloped land, some of which is used for grazing. The least developed areas are found in the middle and upper sections. The densest development is found in the lower portion of the watershed. The mouth of the watershed, where Sims Bayou empties into the Houston Ship Channel/ Buffalo Bayou, is framed by large industrial facilities.

History and Development

The Sims Bayou watershed has been transformed from grasslands and bottomland forests, to farmlands, to an area that has a broad mix of urban features. In 1915, development extended only as far west as Telephone Road (SH-35), leaving the rest of the bayou to meander along a relatively undisturbed, flat coastal plain. During the 1940's and 1950's, increasing population led to westward expansion, especially along the southern bank of the bayou.

During this time, what is now William P. Hobby Airport began operating as Houston's first public airport in the lower eastern portion of the watershed. Houston's southwest corridor grew throughout the 1970's, generating developments in parts of Stafford and Missouri City in the upper portion of the watershed. Development also continued in the lower watershed, which, by 1982, was densely populated east of Mykawa Road. Today, only part of the middle portion of the watershed remains area largely undeveloped ranchland.



Sims Bayou

