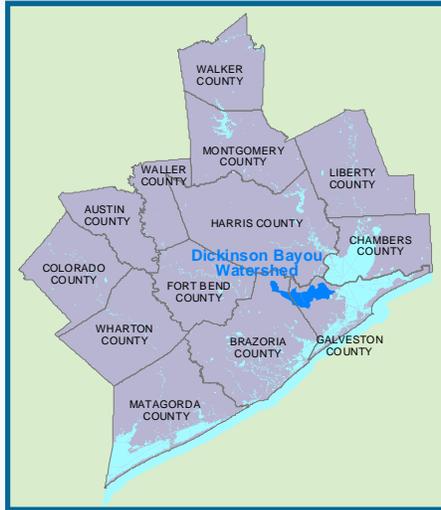


Dickinson Bayou Special Study



BACKGROUND

Dickinson Bayou is on the state's list of water bodies not meeting water quality standards for dissolved oxygen (DO) and bacteria levels. As a result, the bayou does not meet its aquatic life use nor its contact recreation use, creating a possible environmental and/or public health concern. To address these problems, a partnership was formed between the Galveston County Health District (GCHD), the Houston-Galveston Area Council (H-GAC), the U.S. Geological Survey (USGS), and the Texas Commission on Environmental Quality (TCEQ) to conduct a special study.

PROJECT LOCATION

Dickinson Bayou is located in southeast Texas in the San Jacinto-Brazos Coastal Basin. The bayou originates north of the City of Alvin in Brazoria County and flows east approximately 24 miles through Galveston County where it drains to Dickinson Bay, a secondary bay of Galveston Bay. Major named tributaries that flow to Dickinson Bayou include Gum Bayou, Benson Bayou, Magnolia (Geisler) Bayou, Bordens Gully, Cedar Creek, and LaFlore's Bayou.

PROJECT DESCRIPTION

The study was designed to evaluate water quality over a period of time at several locations along Dickinson Bayou. The project focused on the tidal portion of the bayou, a very sluggish water body dominated by a deep, v-shaped channel with an average depth of 10-15 feet.

Data collection devices were deployed at each of nine sites for five consecutive days each month from July 2000 to August of 2001. In addition, water quality samples were taken for laboratory analysis. The U.S. Geological Survey collected supplemental biological data. Data analysis was performed on the resulting data values to form generalized conclusions about the bayou.

Dickinson Bayou currently does not meet state requirements for aquatic life or contact recreation

MAJOR FINDINGS of the study confirmed that salinity, ambient temperature, and rainfall runoff, as well as algal blooms and organic loading influence Dickinson Bayou's low DO levels.

A saltwater wedge ("halocline") was found extending from Dickinson bay upstream to Cemetery Road. Saltwater tends to encroach more during warmer, drier summer months. Little or no encroachment occurs during the rainy, cooler, winter months. This halocline creates a horizontal barrier between fresh and saltwater layers, preventing movement of DO between the two. Zero DO was frequently measured in the saltwater wedge, while higher DO levels were generally found above that wedge, in the fresher water. The halocline disappeared only during high flow periods following significant rainfall events.



Runoff from significant rainfall events contributes to the high bacteria concentrations. Also, higher bacteria levels were found at sampling sites in more rural settings, probably due to greater use of septic systems and rangeland runoff.

The Dickinson Bayou watershed is experiencing land use changes as a result of urban, commercial, and rural development. These changes will continue to cause biological, chemical, and physical pressures on the bayou and its ability to absorb and process the

increased loading from point and nonpoint source pollution.

The TCEQ will use the gathered data and analysis to conduct modeling on the bayou to determine how to proceed with completing a watershed action plan for addressing the low DO occurrence and reducing the bacterial contamination.



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