



Improving Water Quality in Upper Oyster Creek A Project to Protect Recreational and Aquatic Life Uses

High concentrations of bacteria such as *E. coli*, which are found in both human and animal waste, indicate a possible health risk to people who swim or wade in Upper Oyster Creek—activities called “contact recreation” in the state’s standards for water quality. In addition, low dissolved oxygen concentrations in some areas of the creek indicate that conditions are not optimal for aquatic life.

The TCEQ conducted total maximum daily load (TMDL) projects to determine the measures necessary to restore and maintain water quality in Upper Oyster Creek. The goal of a TMDL is to determine the amount (or load) of a pollutant that a body of water can receive and still support its designated uses. The allowable load is then allocated among categories of sources within the watershed, and stakeholders work with the state to develop an implementation plan (I-Plan) with measures that reduce pollutant loads.

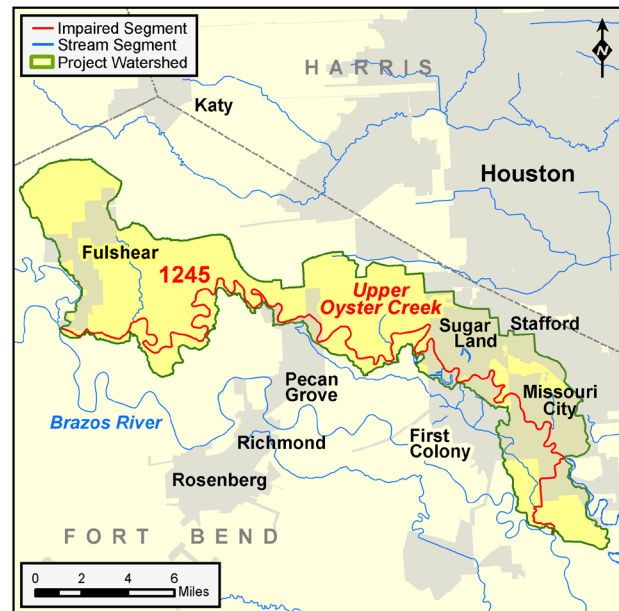
Oxygen gas, which dissolves in water, is essential for the survival of aquatic life. While the amount of dissolved oxygen in water fluctuates naturally, various human activities can cause unusually or chronically low dissolved oxygen levels, which may harm fish and other aquatic organisms.

Bacteria are commonly found in the intestines of warm-blooded organisms such as humans, livestock, poultry, cats, dogs, wildlife, and feral animals. Bacteria from human and animal waste often indicate the presence of disease-causing microorganisms, which can pose a health threat to people who engage in contact recreation.

Learn more about water quality standards and monitoring by reading [Preserving and Improving Water Quality](#)¹, available on our website.

Upper Oyster Creek Watershed

Upper Oyster Creek is located within the Brazos River Basin, immediately southwest of Houston in northern Fort Bend County. Segment 1245, though named Upper Oyster Creek, also includes parts of Jones Creek, Oyster Creek, Flat Bank Creek, a diversion canal, and Steep Bank Creek. Upper Oyster Creek has been highly modified, and serves as a portion of a water conveyance system for the Gulf Coast Water Authority (GCWA). Water is pumped



seasonally into Upper Oyster Creek from the Brazos River to serve agricultural and other water needs along the segment, and is also pumped outside the Brazos River Basin by GCWA.

Segment 1245 begins at the Shannon Pump Station on the Brazos River and is impounded within the city of Sugar Land for transfer by GCWA. The segment extends below this impoundment before ending at its confluence with the Brazos River. Upper Oyster Creek is affected by municipal and industrial wastewater discharges and by stormwater runoff from agricultural, industrial, and urban areas.

The Upper Oyster Creek watershed covers about 178 square miles. The watershed is located within the Coastal Plain, a region characterized by gently rolling to level terrain. It includes portions of Fort Bend County and the cities of Fulshear, Missouri City, Stafford, and Sugar Land.

TMDL Development

The Upper Oyster Creek TMDL project was initiated by the TCEQ in June 2001 through a contract with the Texas Institute for Applied Environmental Research (TIAER). Tasks in the project included review of existing water quality data for the segment,

¹ <https://www.tceq.texas.gov/publications/gi/gi-351>

selection of water quality models for allocating loadings for bacteria and dissolved oxygen, and the development of a monitoring plan to outline additional sampling strategies necessary to complete the TMDL.

Initially, two years of monitoring were planned for both bacteria and dissolved oxygen. The monitoring began in October 2002, and the bacteria monitoring concluded in December 2004. However, because the dissolved oxygen data showed pronounced differences between the two years, a third year of dissolved oxygen monitoring was conducted in 2005.

Development of an I-Plan for the TMDLs was initiated through an agreement with the Houston-Galveston Area Council. H-GAC coordinated public participation in plan development.

Public Participation

During the development of the TMDLs, the Upper Oyster Creek TMDL Steering Committee provided advice and comment on the project. Committee members represented government, permitted facilities, business, environmental, and community interests in the Upper Oyster Creek watershed.

TMDL Dates

Bacteria TMDL

TCEQ Adoption: August 2007

EPA Region 6 Approval: September 2007

Dissolved Oxygen TMDL

TCEQ Adoption: July 2010

EPA Region 6 Approval: September 2010

I-Plan Date

TCEQ Approval: January 2014

A new coordinating committee led development of the implementation plan in concert with the H-GAC. This committee included members who represent diverse interests in the watershed.

For More Information

Contact one of the people listed below, or visit our project webpage at www.tceq.texas.gov/waterquality/tmdl/25-oystercreek.html.

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Project Highlights

- Bacteria and dissolved oxygen sampling were conducted between October 2002 and September 2005. These data were used during the development of the original TMDLs.
- The TMDL for bacteria was adopted on August 8, 2007, and the TMDL for dissolved oxygen on July 28, 2010.
- The H-GAC led public participation in development of the implementation plan for the TMDLs.
- On January 15, 2014, the TCEQ approved the I-Plan, which addressed both the bacteria and dissolved oxygen TMDLs.
- In response to stakeholder concerns about the lack of recent data collected in Upper Oyster Creek, a new bacteria and dissolved oxygen sampling program was initiated in December 2015 and ended in August 2017.
- A new dissolved oxygen modeling effort was initiated in 2018. The goal of this modeling effort is to develop new TMDL allocations for oxygen-demanding substances in the segment.
- Stakeholders meet each spring in the watershed to discuss the status of efforts to improve water quality in Upper Oyster Creek.