Improving Water Quality in Upper Texas Coast Bays and Estuaries

Six TMDLs for Bacteria in Oyster Waters

Oyster harvests are an important economic resource in coastal areas. Data assessed in 2002 showed that localized sections of bay segments on the Upper Texas Coast were not suitable for harvesting shellfish because of elevated bacteria concentrations. Oyster harvesting, also called the "oyster waters use," is the most commonly impaired use among Texas coastal waters.

High concentrations of bacteria, which are commonly found in human and animal waste, may indicate the presence of disease-causing microorganisms that can pose a health threat to people who consume seafood. Bacteria can accumulate in oysters and other shellfish, making them unsafe to eat, especially if eaten raw.

To address the impaired oyster waters use, the TCEQ developed total maximum daily loads (TMDLs) for the impaired segments. A TMDL determines the amount (or load) of a pollutant that a body of water can receive and still support its designated uses. This allowable load is then allocated among categories of sources within the watershed.

Stakeholders worked hard to complete an implementation plan, or I-Plan, which outlines strategies to reduce bacteria levels and improve the safety of oyster harvesting.

Learn more about water quality standards, monitoring, and TMDLs by reading *Preserving and Improving Water Quality*, available on our website at <www.tceq.texas.gov/goto/tmdl/>.

Upper Texas Coast Watershed

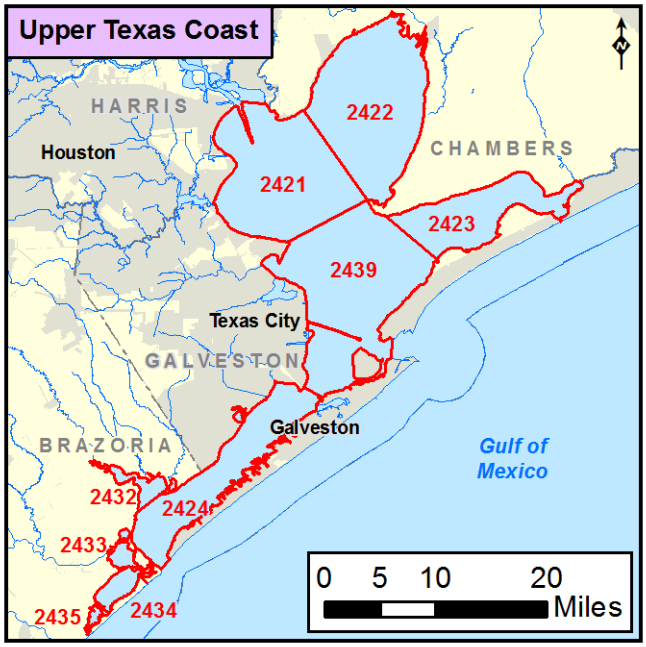
The upper Texas coast project includes six segments:

- Upper Galveston Bay (Segment 2421)
- Trinity Bay (Segment 2422)
- East Bay (Segment 2423)
- West Bay (Segment 2424)
- Chocolate Bay (Segment 2432)
- Lower Galveston Bay (Segment 2439)

These segments lie within the Neches-Trinity Coastal Basin, Trinity River Basin, San Jacinto River Basin, and the San Jacinto-Brazos Coastal Basin.

How the Safety of Oyster Harvesting Is Assessed

The TCEQ Water Quality Standards use fecal coliform as the indicator bacteria for assessing the oyster waters use. These standards are based on risk assessments established by the Department of State Health Services (DSHS).



To protect the safety of seafood consumption, median fecal coliform concentrations in bay and gulf waters should not exceed 14 colonies per 100 milliliters of water, with not more than 10 percent of all samples exceeding 43 colonies per 100 milliliters of water. The TCEQ also imposes a 1,000 foot buffer zone, measured from the shoreline at ordinary high tide, where those fecal coliform criteria do not apply.

The Seafood Safety Division of the DSHS assesses the oyster waters use for Texas waters. DSHS is responsible for monitoring and classifying all shellfish beds into harvesting categories: approved, conditionally approved, restricted, or prohibited. These classifications are published as maps on their website at <www.dshs.state.tx.us/seafood/Classification.shtm>.

The maps, along with DSHS water quality data and sanitary surveys, serve as the basis for the TCEQ's assessment of the oyster water use.

Restricted Harvest Zones (RHZs) are areas where oyster harvesting is allowed, but not for direct marketing. The size of oyster beds designated as RHZs in the project area ranges from 27 percent of East Bay to 100 percent of Chocolate Bay.

TMDL Development

Calculations of bacteria loads were completed using a concentration-based approach. Concentration-based calculations compare water quality to both the median and the 90th percentile criteria. Initially, the median and 90th percentiles were calculated for each sampling location and compared to the water quality standards.

Within the project water bodies, the 90th percentile criterion was exceeded at 25 of the 41 locations routinely sampled within the RHZs; the median criterion was exceeded at only 2 of the 41 sample locations. The most probable bacterial sources are marinas, boat traffic, failing septic systems, migratory birds, wildlife refuges, stormwater, and other unmanaged animals.

The magnitude of bacteria concentrations varies widely throughout all the bays. Analysis revealed that isolated zones of high bacteria concentrations occur in discrete areas near shorelines, rather than occurring chronically throughout the bays. Because the concentrations that routinely exceed standards are confined to these discrete areas, bay-wide reductions should be achieved by targeting each isolated area.

I-Plan Development

Stakeholder planning meetings began in January 2010. Work groups were formed in February 2010 to develop specific elements of the I-Plan. The stakeholders submitted their final draft I-Plan to the TCEQ in August of 2014. Public comment meetings were held in League City and Oak Island on April 27-28, 2015 respectively. The commission approved the I-Plan on August 19, 2015.

Public Participation

In all its projects, the TCEQ seeks opinions and information from people who represent government, permitted facilities, agriculture, business, environmental, and community and private interests in the watershed.

The Galveston Bay Foundation coordinated stakeholders' development of the I-Plan under a contract with the Houston–Galveston Area Council.

For More Information

Contact one of the people listed below, or visit the project website at:

<www.tceq.texas.gov/waterquality/tmdl/74-upper-coastoyster.html>

TCEQ TMDL Program
Chip Morris
chip.morris@tceq.texas.gov
512-239-6686

Houston–Galveston Area Council
Todd Running
todd.running@h-gac.com
713-993-4549

Galveston Bay Foundation
Charlene Bohanon
cbohanon@galvbay.org
281-332-3381 x215

TMDL Development

TCEQ Adoption: August 20, 2008
EPA Region 6 Approval: February 4, 2009

Implementation Plan Development Status

TCEQ Approval: August 19, 2015

Highlights

- The commission adopted the TMDLs on August 20, 2008. The EPA approved them on February 4, 2009.
- The stakeholders submitted their final draft I-Plan to the TCEQ in August of 2014. The public comment period for the plan extended from April 17 to May 18, 2015.
- The commission gave final approval to the Implementation Plan on August 19, 2015.

Visit our website at: <www.tceq.texas.gov/goto/tmdl/>