



Improving Water Quality in Upper Texas Coast Bays and Estuaries

A Project to Protect 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, 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.

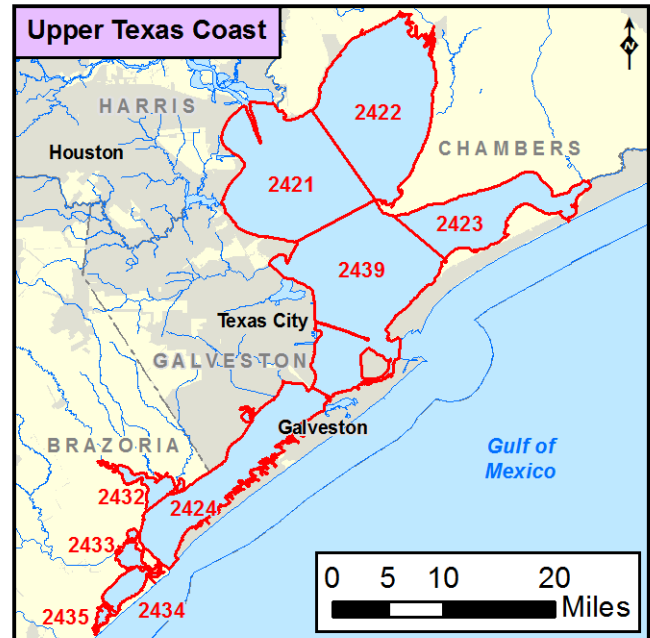
Stakeholders worked to complete an implementation plan, or I-Plan, which outlines strategies to reduce bacteria levels and improve the safety of oyster harvesting.

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

Upper Texas Coast Watershed

The original upper Texas coast project included 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)
- In 2012, three additional segments were added to the project area:
- Bastrop Bay/Oyster Lake (Segment 2433OW)
- Christmas Bay, (Segment 2434OW)
- Drum Bay, (Segment 2435OW)



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

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 Texas 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. 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 DSHS Seafood Safety Division assesses the oyster-waters use for Texas. DSHS classifies all shellfish beds into harvesting categories: approved, conditionally approved, restricted, or prohibited. These classifications are published as maps on the DSHS webpage [Shellfish Harvesting and Maps](#)².

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

² <https://www.dshs.texas.gov/seafood/shellfish-harvest-maps.aspx>

The maps, along with DSHS water quality data and sanitary surveys, serve as the basis for TCEQ's assessment of the oyster-waters 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 bacteria criteria. Initially, the median and 90th percentiles were calculated for each sampling location and compared to the criteria.

Within the project water bodies, the 90th percentile criterion was exceeded at 25 of the 41 locations routinely sampled within the RHZs; however, 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, other unmanaged animals, and stormwater.

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.

TMDL Dates

TCEQ Adoption: August 20, 2008

EPA Region 6 Approval: February 4, 2009

Addendum 1: September 2009

Addendum 2: April 2012

Addendum 3: August 2012

I-Plan Date

TCEQ Approval: August 19, 2015

After adoption of the original six TMDLs, additional TMDLs were developed for newly listed segments in the watershed (Segments 2421, 2422, 2423, 2424, 2432, 2433, 2434, 2435, and 2439). These additional TMDLs are implemented through the same I-Plan as the original TMDLs.

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 TCEQ in August of 2014. Public comment meetings were held in League City and Oak Island on April 27-28, 2015 respectively.

Public Participation

In all its projects, 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 stakeholder participation in the development of the TMDLs and I-Plan under a contract with the Houston-Galveston Area Council.

For More Information

Visit the project webpage at:

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

E-mail us at tmdl@tceq.texas.gov or call us at 512-239-6682.

Highlights

- The stakeholders submitted their final draft I-Plan to TCEQ in August of 2014. TCEQ solicited public comment on the draft plan from April 17 to May 18, 2015.
- In 2019, stakeholders prepared a summary of their status in implementing the I-Plan. The summary is available on the project webpage.