



Improving Water Quality in Oso Bay and Laguna Madre Surveying the Aquatic Life Use

The state of Texas requires that the water quality in Oso Bay (Segment 2485) and Laguna Madre (Segment 2491) be suitable for swimming, wading, fishing, a healthy aquatic ecosystem, and for growing and harvesting clams, mussels, or oysters. However, water quality testing found that dissolved oxygen levels are sometimes lower than the standard established to assure a healthy aquatic ecosystem.

Oxygen, 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.

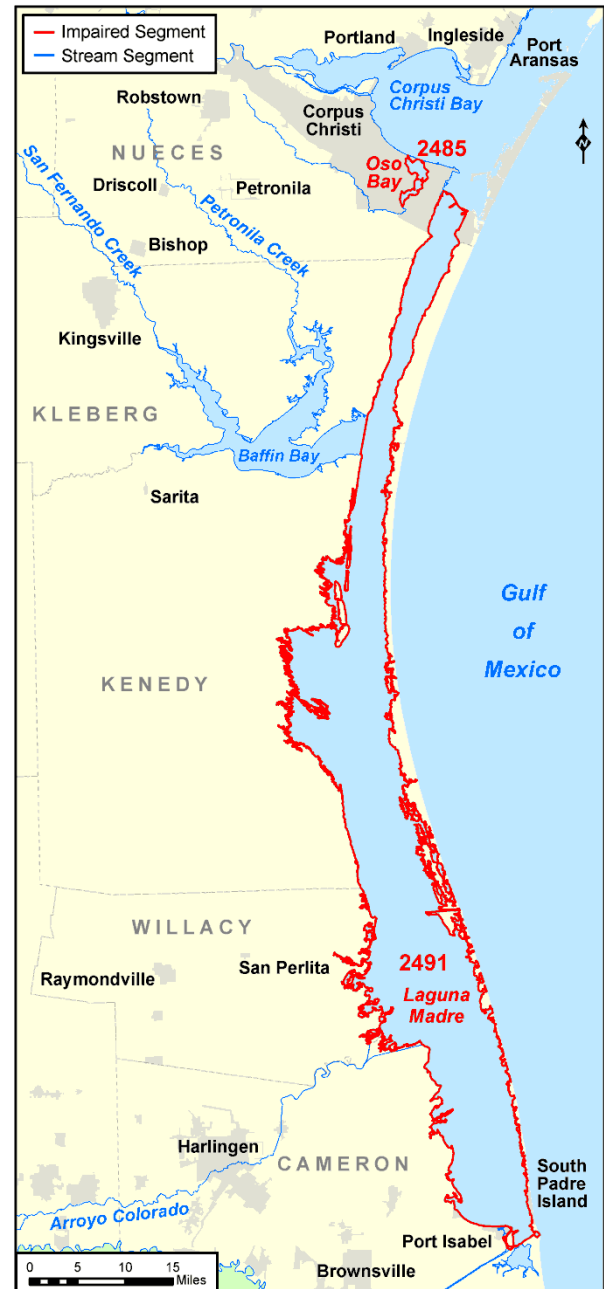
Beginning in 2001, the TMDL Team conducted a project to survey dissolved oxygen concentrations in the two water bodies. The results indicated that low dissolved oxygen levels continue to be a problem, but are likely due to natural conditions. Consequently, the TCEQ determined that it was most appropriate to carry out a use attainability analysis (UAA) rather than develop a total maximum daily load (TMDL).

Many water bodies are evaluated against a general set of standards that are applied to all water bodies, regardless of local conditions. A UAA establishes the standards that are appropriate for a specific water body, taking into account the unique features of the local ecosystem and watershed. A UAA may result in an adjustment to a more appropriate standard; or the TCEQ may instead develop a TMDL. 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 beneficial uses.

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/.

The Oso Bay Watershed

The Oso Bay watershed drains an area of approximately 255 square miles and is located in the northern-most portion of the Nueces-Rio Grande Coastal Basin. The bay is an enclosed, shallow body of water situated along the southern shore of Corpus Christi Bay, with a surface area of approximately 7 square miles. The bay receives fresh water from Oso Creek, a stream whose flow is dominated by permitted discharges, and exchanges saltwater with Corpus Christi Bay. Ecologically, Oso Bay provides habitat for many plants and ani-



mals, and plays an influential role in water purification and storm protection.

Corpus Christi is the only major metropolitan area that lies within the watershed boundaries. The only other large community within the watershed is Robstown. Economic activities in and around the bay include oil

and gas refining and production, agriculture, manufacturing, and tourism.

The Laguna Madre drains most of the Nueces-Rio Grande Coastal Basin (10,442 square miles) and is one of only five hypersaline or negative estuaries in the world. The Laguna is a shallow, bar-built coastal lagoon with limited freshwater inflow and a surface area at mean high tide of 729 square miles.

The Arroyo Colorado is primarily responsible for freshwater inflow to the lower Laguna Madre. Freshwater inflow is primarily attributed to municipal or industrial discharges and to runoff from rainfall events. Tides in the Laguna Madre are minimal. Ecologically, the Laguna is characterized as exhibiting hypersaline conditions, barren shorelines with extensive wind-tidal flats, extensive submerged seagrass meadows, and a highly productive finfishery.

Several cities and towns are located along the shoreline adjacent to the Laguna Madre—Corpus Christi, Port Mansfield, Laguna Vista, Laguna Heights Port Isabel and South Padre Island. The shorelines of the Laguna Madre are predominantly inaccessible because of the large tracts of privately owned ranch land and the establishment of two federally protected areas—Padre Island National Seashore and Laguna Atascosa National Wildlife Refuge. Economic activities in and around the lagoon include ranching, oil and gas production, agriculture, fishing, recreation and tourism.

Project Development

Project staff first initiated targeted monitoring to determine if dissolved oxygen measurements collected from Oso Bay and a nearby control site in the upper Laguna Madre exceeded the criteria established by the TCEQ standards. The results verified the low dissolved oxygen levels; however, the data raised many questions about the appropriateness of the criteria.

Development Status

Start Date: June 2001

Projected End Date: August 2009

Project Highlights

- In August 2000-October 2001, the TCEQ collected 24-hour dissolved oxygen data in Oso Bay, with a control site located in the upper Laguna Madre.
- In June 2002, the TCEQ decided that additional 24-hour dissolved oxygen monitoring was necessary to evaluate whether the oxygen criteria for the bay should be adjusted. Analysis of that additional data suggested that the TCEQ should consider establishing site-specific standards.
- The Water Quality Standards group completed a use attainability analysis, and proposed site-specific oxygen criteria for both water bodies in the 2010 revisions to the water quality standards. The commission adopted the revisions on June 30, 2010.
- The EPA rejected the revisions for Oso Bay and Laguna Madre because they did not consider them adequately supported by the documentation. The Standards Work Group is carrying out additional assessment to support a change to the standards. E-mail standards@tceq.texas.gov for information about the standards.

The TCEQ then did additional monitoring to capture annual seasonal variability in dissolved oxygen concentrations and extended the project area to include the entire Laguna Madre and Oso Bay.

In 2010, the TCEQ proposed revisions to the site-specific standards for dissolved oxygen in the bay. The EPA rejected those revisions as not adequately supported by the documentation. The Standards Work Group is carrying out additional assessment to support a change in the standards.

Public Participation

In all its projects, the TCEQ seeks to gather opinion and information from people who represent government, permitted facilities, agriculture, business, environmental, and community and private interests in the watershed. The stakeholder committees of the Coastal Bend Bays and Estuaries Program (CBBEP) provided the forum for local participation in this project. These committees include representatives from state and federal agencies, industries, citizen groups, local governments, universities, water districts, agricultural interests, environmental groups, and other water user groups.

For More Information

Visit the project website at:

<www.tceq.texas.gov/implementation/water/tmdl/24-osobayoxygen.html>

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