Texas Commission on Environmental Quality
Total Maximum Daily Load Program
GI-535

Improving Water Quality in Oso Bay

A Project to Assess Oyster Harvesting Uses

To protect consumers, the Texas Department of State Health Services (DSHS) designates, monitors, and classifies shellfish harvesting areas along the Texas coast. DSHS has identified Oso Bay, Segment 2485, as an oyster harvesting area and classified it as restricted. Although there are no oyster beds in Oso Bay, because it empties into Corpus Christi bay, it is considered part of the larger bay's harvesting area.

The use of coastal waters for harvesting shellfish — called the "oyster waters use" in the state's standards for surface water quality—is the most commonly impaired use among Texas coastal waters. Microorganisms from human and animal waste may contaminate oysters and other shellfish, making them unsafe to eat, especially since some shellfish are eaten raw. However, DSHS restrictions are based on their estimated risk of bacterial contamination rather than on actual measurements of bacteria in oysters or oyster waters.

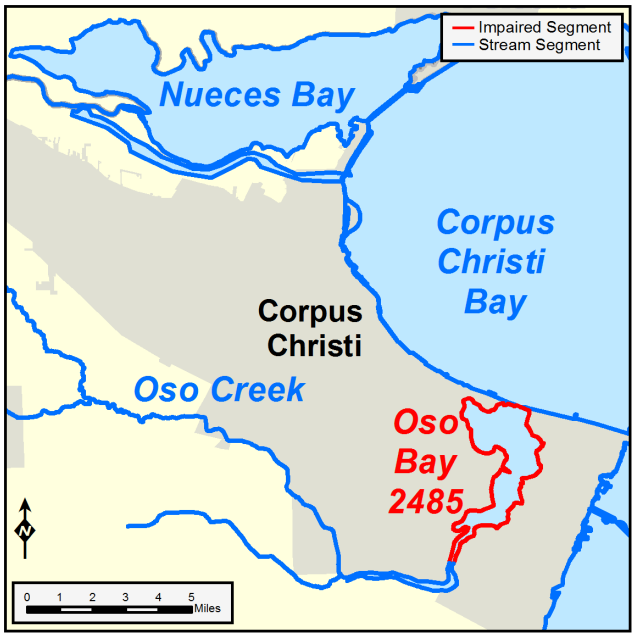
In response to the oyster waters restriction, TCEQ developed a project to gather additional indicator bacteria data from 2013 through 2014 to assess water quality in the bay. The goal of the project was to determine whether actual bacteria concentrations in Oso Bay exceeded the criteria for oyster harvesting.

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

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 watershed is wholly contained within Nueces County. The bay is an enclosed, shallow body of water situated along the southern shore of Corpus Christi Bay, with a surface area of approximately seven square miles.

Oso Bay receives fresh water from Oso Creek, a stream whose flow is dominated by permitted discharges. Oso Bay exchanges saltwater with Corpus Christi Bay. Ecologically, Oso Bay provides habitat for many plants and animals, and plays an influential role in water purification and storm protection.



Corpus Christi is the only major metropolitan area within the watershed's boundaries. The only other large community in the watershed is Robstown. Economic activities in and around the bay include oil and gas refining and production, agriculture, manufacturing, and tourism.

Project Development

TCEQ initiated the oyster waters sampling project for Oso Bay in 2013. TCEQ is also working with stakeholders in the area on two other projects in the area, for Oso Bay and Oso Creek, related to risks for contact recreation due to elevated bacteria concentrations.

Staff from the Center for Coastal Studies at Texas A&M University–Corpus Christi (TAMU-CC) provided technical expertise on all aspects of this project. Beginning in 2013, they collected fecal coliform and Enterococcus samples from the bay through 2014.

Because birds are thought to be a significant source of bacteria loading to the creek, the TAMU-CC team also reported on the birds they observed in the area during each sampling event. The final report indicated that bird populations were generally low, except at one

[1] https://www.tceq.texas.gov/publications/gi/gi-351

sampling location. At that exceptional site, birds could be a significant source of bacteria.

Conclusions

The final project report confirmed that Oso Bay is generally not meeting the standard for oyster water harvesting. This finding validates the risk assessment by DSHS. Because bacteria concentrations spiked during rainfall events, stormwater runoff is the most likely source.

Two measures of bacteria were used to evaluate conditions—a median concentration over time and a percent of time the maximum concentration was exceeded. Five stations were monitored. At three of the stations, the acceptable median concentration was exceeded most of the time. At all five stations, concentrations higher than the maximum happened more than 90% of the time.

Bacteria concentrations were consistently higher than the criteria used to determine the possibility of health risks to people from eating oysters.

TMDL Development

Because stakeholders in the region are working on two related TMDL projects for Oso Bay and Oso Creek to reduce bacteria concentrations impairing the contact recreation use, stakeholders opted not to develop a TMDL for bacteria affecting the oyster waters use at the conclusion of the sampling project. Stakeholders' activities to reduce bacteria affecting the contact recreation use, when implemented, are likely to reduce the number of bacteria in the bay, which would probably reduce bacteria in oysters. Stakeholders may still opt in future to develop a TMDL for bacteria affecting the oyster waters use.

Public Participation

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

TAMU-CC personnel coordinated stakeholder participation in this project, sharing and discussing technical information about their activities with stakeholders.

For More Information

Visit the project webpage at:

www.tceq.texas.gov/waterquality/tmdl/67-osobaybacteria.html

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

Survey Dates

Start Date: 2013
End Date: 2014

Project Highlights

- Staff of TAMU–CC collected additional fecal coliform and Enterococcus bacteria samples from the bay. Sampling began in February 2013 and was completed in 2014. The TAMU-CC team also reported on the birds they observed in the area during each sampling trip.
- Results from this project confirmed that Oso Bay is generally not meeting the standard for oyster water harvesting.
- No TMDL was developed as a result of this project, because two related projects for bacteria in Oso Creek and Oso Bay are likely to lead to reductions in the number of bacteria in both water and oysters. Stakeholders may still opt in future to develop a TMDL for the oyster waters impairment.