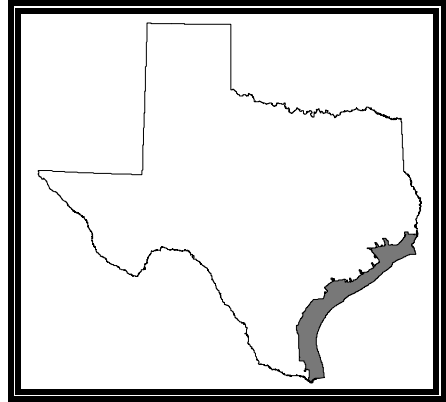


Basin 24

Bays and Estuaries



Bays and Estuaries Narrative Summary

The Texas Coast portion of the Gulf of Mexico includes nine major bay systems. The entire region is part of the Western Gulf Coastal Plain ecoregion. The coastal plain is characterized by a gently sloping, lowland environment. Historical periods of coastal flooding and intense sediment deposition have sculpted the Gulf of Mexico shoreline. Today, much of the coastal region is comprised of large bays, lagoons, extensive wetlands, sandy beaches, and barrier islands. The estuaries are typically bordered by tidal marshes and mud-sand flats. Most of the Texas estuaries are shallow, have turbid water due to suspended sediment, and are semi-enclosed by barrier islands.

For this report, all of the 48 classified estuarine segments and water bodies are organized into a single basin to unify discussion and presentation of data. In total, the estuarine water bodies cover approximately 2,002 square miles. Verbal descriptions of these estuarine water bodies have not been finalized, but approximate boundaries are illustrated on the upper, middle, and lower basin maps.

Estuaries are formed where rivers, streams, and bayous meet the salt water of the Gulf of Mexico. In the estuaries, tides mix inflowing freshwater with saline water from the Gulf of Mexico. In Texas, estuaries are protected by barrier islands. Estuarine habitats include river deltas, emergent marshes, mud and sand flats, submerged seagrass beds, oyster reefs, and open bay bottoms. Estuarine waters also include the tidally influenced parts of rivers, streams, and bayous. The tidal portions of most major streams and rivers have been established as classified segments by the TCEQ. Descriptions of their physical and water quality characteristics are discussed in the individual river basin narrative summaries. The remaining estuarine waters are primarily primary, secondary, and tertiary bays. These areas serve as important nursery areas for many commercial fish and shellfish populations, including shrimp, oysters, crabs, and scallops. Recreational anglers also enjoy harvesting fish that reproduce or feed in estuaries, such as red drum, spotted seatrout, and flounder.

The estuaries are primarily monitored by the TCEQ, CRP and the TDH. These three agencies have routinely monitored 554 surface water quality monitoring sites on the classified bay segments and 34 additional sites on unclassified bay waters during the current year (2002). Two of the most common problems in the bays are related to natural conditions. Freshwater inflow to the bays is mainly from river systems such as the Sabine, Neches, Trinity, Brazos, Colorado, Guadalupe, and Nueces. The presence of barrier islands, coupled with low runoff and high evaporation rates along the southern Texas coast, produces hypersaline conditions in these estuaries, particularly in the summer months. During warm summer months, water temperatures in the Texas estuaries often exceed 34° C (94.3° F). The elevated temperatures reduce the ability of the water to hold

dissolved oxygen, so sometimes concentrations are depressed below criteria.

Oso Bay (Segment 2485) and Highland and Marchand Bayous (in Segment 2424) have been identified with depressed dissolved oxygen concentrations that cause impairment of the aquatic life use. Elevated fecal coliform densities is the most common problem in the bays causing nonsupport of the oyster waters use in portions of 14 estuaries. Elevated fecal coliform densities cause impairment of the contact recreation use only in five unclassified water bodies that drain to bays.

In 1990, TDH issued a restricted consumption (one meal per month) and a sub-population no-consumption (women of child bearing age, pregnant women, and children) advisory for dioxin (ADV-3). The advisory includes all species of catfish and blue crabs in the Houston Ship Channel and all contiguous waters including Upper Galveston Bay and associated side bays (Black Duck, Burnet, San Jacinto, Scott, Tabbs Bays, Barbour's Cut, and the Bayport Channel). The advisory was issued due to elevated dioxin levels in catfish and blue crabs.

The TDH has also issued an aquatic life closure for parts of Lavaca Bay due to elevated mercury levels in fish and crabs. The closure prohibits the possession of any finfish or crabs from the areas.

Many of the estuarine water bodies are enriched with nutrient compounds. Nutrient sources are from both point and nonpoint discharges. These inputs are known to have direct effects on water quality. In some cases, excess nutrients can stimulate algal blooms that can lead to increased turbidity, wide temporal changes in dissolved oxygen, and changes in structure and function of aquatic communities. Though most of the bays are enriched with nutrients, screening levels for at least one type of nutrient are exceeded in 12 water bodies. However, in response to elevated nutrient concentrations, excessive algal growths (as estimated by chlorophyll *a*) have been observed in Clear Lake (Segment 2425), Oso Bay (Segment 2485), Baffin Bay (Segment 2492) and the Laguna Madre (Segment 2491). The sediments of the bays tend to accumulate metals. Elevated concentrations of chromium, manganese, and nickel are found in Lavaca Bay sediments.