

Our bays and estuaries provide seafood, recreation and economic benefits. It's important to study and protect them to ensure these benefits continue in the future.

Each question in this Environmental Indicators Report is addressed by selecting indicators, and providing a discussion of the background, concerns, and an explanation regarding the local conditions. The goal of this report is to provide the community with important information about the health of our bays and estuaries. It will also help gauge trends and improve plans for the future.



Before the questions are presented, this introduction gives some background about the area and the issues affecting it, such as population growth, water use, port traffic, air quality, climate change, and tourism. Often these issues become factors in the future health of our bays and estuaries.



The Program

The Coastal Bend Bays & Estuaries Program (CBBEP) is a local non-profit 501(c)(3) organization established in 1999. The CBBEP project area encompasses the 12 counties extending from an area locally referred to as the land-cut in the Laguna Madre, through the Corpus Christi Bay system, and north to the Aransas National Wildlife Refuge.

The mission of the CBBEP is the implementation of the Coastal Bend Bays Plan, which is designed to protect and restore the health and productivity of the bays and estuaries while supporting continued economic growth and public use of the bays.

The CBBEP is a non-regulatory, voluntary partnership effort working with industry, environmental groups, bay users, local governments and resource managers to improve the health of the bay system. Public participation by individuals and organizations is encouraged.

Physical Landscape

The CBBEP area includes 75 miles of estuaries along the south-central coastline of Texas, encompassing 12 counties, 11,500 square miles of land, 515 square miles of bays, estuaries and bayous, including three of the seven major estuaries in Texas: Aransas Bay, Corpus Christi Bay, and Upper Laguna Madre.

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HABITATS WITHIN THE CBBEP AREA



Open Bay

The open bay community is defined as the unvegetated and soft-bottomed portion of the subtidal estuarine environment. Extent of the open bay community is determined primarily by factors limiting success of submerged plants and oysters such as depth, turbidity, exposure to wave action, and salinity. The primary production is dominated by phytoplankton which are the base of the food chain. Most of Corpus Christi Bay, Nueces Bay, Oso Bay, Mission Bay, and Aransas Bay, except for a few scattered areas of oyster reefs and seagrass meadows, can be characterized as open bay.

Seagrass Meadows

Seagrasses are submergent, flowering plants that grow in marine environments; they are not true grasses. Seagrass meadows are found primarily in shallow water (<1 m) in estuaries, hypersaline lagoons and brackish water areas. They are among the most productive ecosystems in shallow waters. They provide nursery areas for estuarine fish and wildlife, and food sources for various fauna including fish and waterfowl. Extensive seagrass meadows are found in the Upper Laguna Madre and Redfish Bay.



Coastal Marshes

Coastal marshes are intertidal areas between upland and estuarine/marine systems, and are dominated by marsh grasses and plants. Coastal marshes are important nursery and feeding grounds for a variety of invertebrates and fish. Extensive coastal marshes occur in the northern part of the CBBEP area where freshwater inflow and precipitation are higher than in the southern portion. Coastal marshes are replaced by extensive wind tidal flats from Mustang Island southward, due to lower precipitation and higher evaporation rates.



Tidal Flats

Tidal flats are seemingly barren, relatively featureless sand and/or mud environments bordering lagoons and bays. Within the CBBEP area, most tidal flats are wind-tidal flats inferring that wind-associated tides are responsible for the frequent submergence that maintains this feature. Tidal flats provide essential habitat to migrating shorebirds and are highly productive. Tidal flats are found on the bay sides of St. Joseph Island, Mustang Island, and Padre Island, and at the bay margins of Baffin Bay and its secondary bays.



Barrier Islands

Barrier islands are elongate landforms that lie parallel to the mainland shoreline and are typically isolated from the mainland by bays and lagoons. Barrier islands extend along the easternmost boundary of the CBBEP area and include southern Matagorda, St. Joseph, Mustang and northern Padre islands. These islands function as protective barriers to the adjacent Texas mainland and shallow bays and lagoons. In addition, unique flora and fauna inhabit the islands and increase the biologic diversity of the CBBEP area.



Gulf Beach

The Gulf beach habitat encompasses the easternmost sandy shoreline and associated shallow, nearshore waters of the barrier island chain that fringes the Texas coast. This habitat community is often highly diverse and highly productive due to the transport of food by currents. Matagorda, St. Joseph, Mustang, and Padre islands serve as protective barriers to the three principal estuarine systems, Mission-Aransas, Nueces, and Baffin Bay-upper Laguna Madre, contained within the CBBEP area.



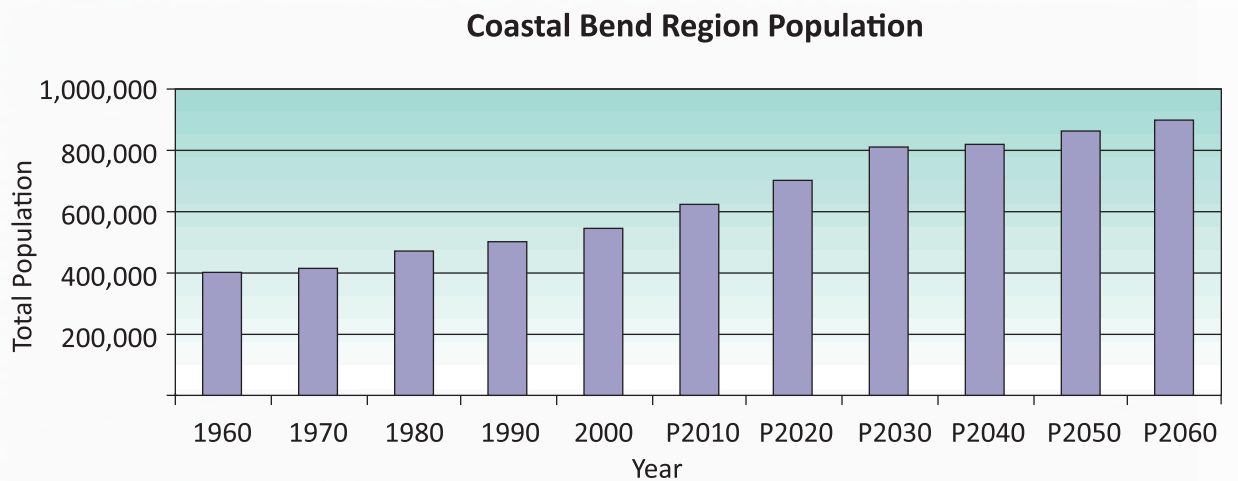
Background Information

Population Growth in the Coastal Bend

The population of the 12-county CBBEP coastal study area has increased by 36 percent between the years of 1960 and 2000, with a recorded population of 550,000 people in 2000. According to the Texas Water Development Board, the Coastal Bend population is projected to increase by 44%, to 886,000 (545,000 in Nueces County) by 2060. Many of Texas' major metropolitan areas (Dallas-Fort Worth, El Paso, Houston, Austin, San Antonio) are expected to double between 2000 and 2060. The Rio Grande Valley, our neighboring community to the south, will grow even more rapidly, more than tripling its population between 2000 and 2060.

Population growth can be an underlying cause of ecosystem stress due to the expansion of housing, transportation, and other infrastructures needed to accommodate additional residents. Along with population growth, the CBBEP area will experience a change in land use, an increase of pollutants released to the environment, and depletion of natural resources.

Below is a chart of population growth for the Coastal Bend between the years of 1960 to 2000 and the projected population growth through 2060.



Source: US Census data, Texas Water Development Board Population Projections

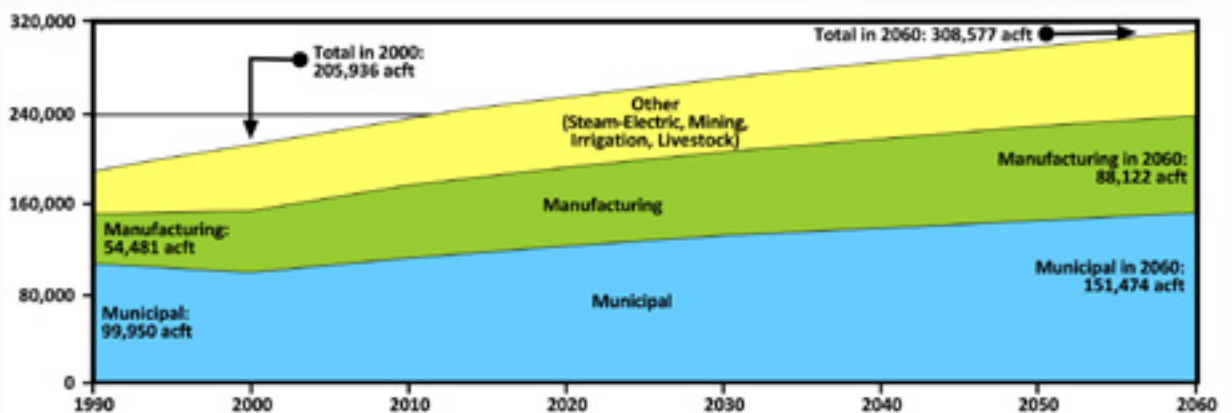
Municipal and Industrial Water Usage

With increasing population and growing industry comes increased demand for resources, including water. The existing and growing human population will need to manage water usage to protect the relatively pristine bays and estuaries of the Coastal Bend.

Over three-fourths of the Coastal Bend's existing water supply is associated with surface water resources. The majority of those supplies are provided by Nueces River Basin streamflows together with reservoirs in the Nueces River Basin (Lake Corpus Christi and Choke Canyon) and interbasin transfers from the Lavaca Region. The region relies on significant amounts of surface water transferred from Lake Texana via the Mary Rhodes Pipeline, which was designed with excess capacity to convey additional, future water supplies, such as an interbasin transfer from the Colorado River Basin.

Total water use for the Coastal Bend region is projected to increase from 205,936 acre feet in 2000 to 308,577 acre feet in 2060, a 50 percent increase. The major water user groups are industrial and municipal, which includes homes and businesses. Because irrigation is only used in a few locations, agricultural water usage is minimal in this area. Future water management strategies include a seawater desalination plant (converting saline water to potable water), two new reservoirs (Nueces off-channel reservoir and Lake Texana Stage II), and surface water from the Colorado River (Garwood Pipeline). While the Coastal Bend has made important strides in researching water conservation opportunities, it is imperative that education and outreach become more intensive as population increases along the coastal areas.

Below is a chart showing total water usage in 2000 and projected water usage in 2060 for the Coastal Bend region.



Source: Texas Water Development Board

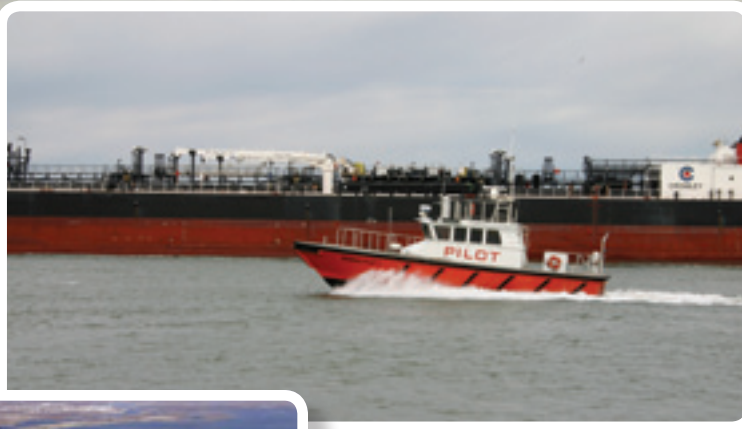
Air Quality

The Coastal Bend's air quality is deemed to be in attainment of the air quality standards established by the US Environmental Protection Agency, which means our area's ozone numbers fall below 75 parts per billion (ppb) over a 3 year period. Although the Coastal Bend enjoys vast areas of agricultural lands, an urbanized section exists. Because of a large concentration of industrial facilities and heavy motor vehicle usage, combined with various commercial practices in the urban areas, in 1995 the area was at risk of exceeding the air quality standard for ground-level ozone. In 1996, the community united to develop and implement a plan to voluntarily make reductions in pollutants that contributed to the elevated ground-level ozone concentrations, thus maintaining a status of "near non-attainment". Corpus Christi's current three year average is 63 ppb.

Port Tonnage

The Port of Corpus Christi is the sixth largest U.S. port in total tonnage. Petroleum products make up the bulk of tonnage entering the port. The Port is also expanding infrastructure to accommodate growing wind and military projects.

The top ten countries, by tonnage, the port did business with during 2007 are Venezuela, Nigeria, Mexico, Russia, Jamaica, United Kingdom, Kuwait, Saudi Arabia, Algeria, and Columbia. Ship and barge activity for the Port during 2008 totaled 6,032 vessels, which included 4,281 barges, 962 tankers, and 789 dry cargo ships.



Port of Corpus Christi Ship and Barge Activity

Number of Dockings

Year	2008	2007	2006	2005	2004	2003
Dry Cargo	789	1,077	942	1,037	905	906
Tankers	962	1,057	1,019	1,043	1,056	1,073
Barges	4,281	4,610	4,672	5,298	5,276	4,787
Total	6,032	6,744	6,633	7,378	7,237	6,766

Source: Port of Corpus Christi Accounting Department Monthly Reports

Climate Change

Buildup of carbon dioxide and other greenhouse gases in the atmosphere is heating the earth and changing our planet and our region. For the Coastal Bend area, changes to our climate could impact our temperature, rainfall, and sea level. Changes in our climate will likely affect the availability of our water resources (due to droughts) and plans to meet expected demands for future water use. Fluctuations in freshwater inflows and sea level rise would alter the salinity in our bays and estuaries, affecting birds and nursery areas for many invertebrates and fish. Sea level rise may also contribute to coastal erosion, coastal flooding, loss of coastal wetlands, and increased risk of property loss from storm surges.



Tourism

The Coastal Bend area is known for its outdoor activities. According to the Corpus Christi Convention and Visitors Bureau, 40 percent of all visitor trips are related to nature and wildlife tourism activities such as beach strolling, bird watching and fishing. Corpus Christi is the sixth most popular tourist destination in Texas with around 7.2 million people visiting in 2008. The tourism industry supports around 13,000 jobs and brings \$1.1 billion into the local economy. Nature tourism alone accounts for 45 percent of spending by all visitors, totaling about \$456.5 million annually. An increased focus on eco or nature tourism is expected.



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- HDR Engineering, Inc. 2006. 2006 Coastal Bend Regional Water Plan. Coastal Bend Regional Water Planning Group. <http://www.twdb.state.tx.us/wrpi/rwp/n.htm>
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