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Galveston Bay Facts

Measurements

Galveston Bay is approximately 30 miles long and 17 miles wide, and 6 to 12 feet deep. It has a surface area of 600 sqare miles.

Population

In 1990 there were over 3.3 million people living in the Houston Metropolitan area and 6 million people living in the Galveston Bay watershed. It was estimated that by the year 2000 over 4 million people would live in the 5 counties bordering Galveston Bay.

Economics

Over 4.2 billion dollars were generated into the Texas economy by travel related activities in the Galveston Bay watershed area.

Water Usage

Over 1.4 billion gallons of freshwater are used each day in the 5 bordering counties of Galveston Bay. The Bay's watershed receives 60% of Texas' wastewater discharge.

Fish - Fishing - Fisheries

The Word "Fish"

"Fish" is singular or plural for more than one fish **of the same species.**

"Fishes" refers to 2 or more **different species** of fish.

A Valuable Resource

Galveston Bay contributes 1/3 of Texas' commercial fishing income. Over 1/2 of our state's expenditures for recreational fishing are related to Galveston Bay. Galveston Bay has the 3rd largest concentration of recreational boats in the U.S.

Galveston Bay supports a population of finfish totaling more than 162 species. Some spend their entire life in the Bay, while others come in from the Gulf as sac fry (newly hatched young) and stay only a couple of years until they mature.

Commercial shrimping in Galveston Bay

Shrimp have been exported from Galveston Bay since the 1920's when frozen transport became possible. By 1930, shrimp became the most important fishery for the bay above fin-fish and mollusks.

According to data from the National Marine Fisheries Service, commercial shrimping in Galveston Bay has been on a generally steady increase since 1956. In that year 106,000 pounds of shrimp were taken from the Bay. That number has steadily risen. In 1998 nearly 4.5 million pounds of shrimp were caught. These numbers do not reflect bait shrimping efforts, so the actual amounts of shrimp taken from Galveston Bay are much higher.

Commercial Fishing

One hundred years ago commercial fishing in Galveston Bay was fairly balanced between finfish and oysters. Today finfish make up about 5% of the total Bay harvest, averaging 1.5 million pounds yearly. The other 95% consists of shrimp, crabs, and oysters. Part of this shift in balance occurred after the 1981 ban on commercial harvesting of spotted seatrout and red drum. The 5% segment of finfish is broken down below:

Finfish Landings by percentage in 1992 Southern Flounders (***Paralichthys lethostigma***) - 26%
Black drum (***Pogonias cromis***) - 17%
Striped mullet (***Mugil cephalus***) - 16%
Sheepshead (***Archosargus probatocephalus***) - 12%
Various other species - 29%

Recreational Fishing

The most popular sport fish in the Galveston area is the spotted seatrout (***Cynoscion nebulosus***), also known as the speckled trout. Other common catches include: Black drum, red drum, flounder, croaker, sheepshead, sand sea trout, gafftopsail catfish, and whiting. The estimated impact on the Texas economy by recreational fishing is 2 billion dollars per year. The Galveston Bay area accounts for 30% of that amount.

Threats to popular finfish can have great impact on the state's economy. Some of these threats include: periodic freezes, oxygen depletion, toxic spills, and "red tide" algal blooms.

The 6 popular recreational fishes in the bay are:

Members of drum family (Sciaenidae) Atlantic croaker (***Micropogonias undulatus***)
Star drum (***Stellifer lanceolatus***)
Spot (***Leiostomus xanthurus***)
Sea trout (***Cynoscion arenarius***)
Non-drum fishes Hardhead catfish (***Arius felis***)
Bay anchovy (***Anchoa mitchilli***)

Galveston Bay's Major Freshwater Sources and Marine Inlets

The Galveston Bay system is divided into 4 major sub-bays: 1) Galveston Bay, 2) Trinity Bay, 3) West Bay, and 4) East Bay. Each of these 4 sub-systems gets an outflow of freshwater from various sources. Galveston Bay receives freshwater flow from the San Jacinto River and local drainage from the city of Houston via Buffalo Bayou and the Houston Ship Channel. The San Jacinto basin contributes 28% of total Bay System inflow. Trinity Bay receives its main freshwater supply from the Trinity River. The Trinity Basin contributes 54% of the total Bay System inflow. West Bay receives freshwater flow from Chocolate Bayou, Mustang Bayou and other local streams. East Bay receives its freshwater from Oyster Bayou and runoff from Chambers County.

Galveston Bay System's inflow from the Gulf of Mexico comes from 2 major inlets and 1 minor cut. "Bolivar Roads" is the inlet between the east end of Galveston Island and the west end of Bolivar Peninsula. This inlet provides 80% of the tidal exchange between the Bay System and the Gulf. San Luis Pass is between the west end of Galveston Island and the east end of Follets Island. This inlet accounts for less than 20% of tidal exchange for the Bay System. "Rollover Pass", located at the eastern most part of East Bay, is a man-made cut responsible for minor amounts of tidal exchange.

Tidal Flow Effects on pH and Salinity in Galveston Bay

Conventionally, it was believed that Galveston Bay was threatened by a rising salinity level due to the

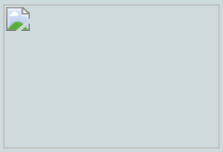
increased human diversion of rivers that feed freshwater into the bay. However, 2 studies done in 1992 and 1993 showed that there was actually a general decrease in salinity within the Bay since 1960. This is a result of an apparent increase in inflow related to human development and increased return flows of wastewater and groundwater. Overall, scientists have found salinity trends within the bay more dynamic and complex than conventionally expected.

Bay waters receive fresh water from rivers and runoff sources and saline waters from Gulf currents and tides, so salinity and pH vary greatly depending on location and time sampled. One study done in the Kemah/Seabrook area found the pH range to be from 7.6 to 8.3 over a six month period. During the same period, salinity ranged from 2 to 20 parts per thousand.

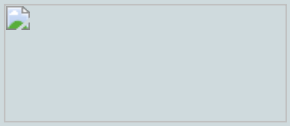
Introduced or Invasive Species

The introduction of exotic species has contributed to the degradation of habitat in the Galveston Bay Estuary System. During the 20th century, the increased efficiency and greater numbers of cargo ships traveling around the world increased the occurrence of accidental introductions of species carried in ballast water. Some species are intentionally introduced by people for various reasons. These are several species that have been introduced and have had some significant impacts in Galveston Bay.

The nutria is a beaver-like mammal brought into Louisiana from South America for their fur-bearing value. Populations of nutria are now living in Galveston Bay's wetland shores. These herbivores can eat away areas of emergent marsh grasses leaving the bare soils susceptible to erosion.
http://www.nutria.de/index.htm (nutria pictures)



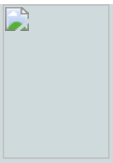
The grass carp, found in the San Jacinto and Trinity River regions of Galveston Bay, consumes aquatic vegetation. The grass carp, *Ctenopharyngodon idella* , has been introduced into the United States as a biological control for aquatic vegetation. Grass carp is still a common option for controlling vegetative overgrowth in restricted areas. Recent innovations in breeding have resulted in sterile individuals to reduce the threat of an increase in wild populations.



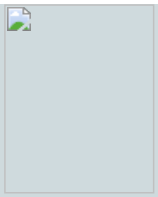
"Fire Ant" is the common name of various different species of ants of the genus *Solenopsis* . There are two species native to the U.S., the tropical fire ant, *S. geminata* , and the southern fire ant, *S. xyloni* . Unlike their imported cousins, these pose no serious threat. The two imported species are the black imported fire ant (BIFA), *S. richteri* and the red imported fire ant (RIFA), *Solenopsis invicta* . Both are thought to have been transported accidentally in ship ballast.

The BIFA was imported from Argentina around 1918. It spread slowly to the surrounding states. The more aggressive RIFA arrived in the late 1930's and has spread much more rapidly. It can displace other ant species, including the BIFA. The RIFA is a pest in the Galveston Bay area. An ecological impact is that they can pose a significant threat to animals, nesting birds for example.

The presence of other species of ants in an area will decrease the possibility that fire ants will move in. As shown below, the RIFA has a head approximately the same width as its abdomen.



A Red Introduced Fire Ant



A native red ant

Threatened and Endangered Species in Galveston Bay

Plants

A Galveston Bay wildflower listed on the Federal endangered species list in 1985:

Texas prairie dawn *Hymenoxys texana*

This orchid was listed as endangered in 1982:

Navasota Ladies'-Tresses *Spiranthes parksii*

Reptiles and Amphibians

In the late 19th century, sea turtle populations were great enough to support a commercial fishery in Galveston. Since then, their numbers have dropped to only a fraction of what they were a century ago. During the 1980's, a total of 27 sea turtles were sighted in Galveston Bay, 18 dead and stranded, and 3 caught in shrimp trawls.

The National Marine Fishery Service has taken action to preserve the remaining populations. In addition to studying the turtles to learn more about them, they are assisting with special precautions that are taken prior to marine seismic blasting and they are assisting with the use of turtle excluder devices (TED's) on shrimp trawlers. NMFS has also started the Head Start Program to hatch, rear, and release young sea turtles.

Today, sea turtles are more common in the Gulf waters, but they do occasionally enter into Galveston Bay to nest or feed. These are some of the nationally endangered and threatened species of reptiles and amphibians that visit Galveston Bay:

Threatened:

Green Sea Turtles *Chelonia mydas*
Loggerhead Sea Turtles *Caretta caretta*

Endangered:

Hawksbill Sea Turtles ***Eretmochelys imbricata imbricata***
Kemp's Ridleys Sea Turtles ***Lepidochelys kempii***
Leatherback Sea Turtles ***Dermochelys coriacea***
Houston Toad ***Bufo houstonensis***

Birds

Bird watching makes up a significant part of the tourism/travel economy of Galveston Bay. According to the Houston Audubon Society Sanctuary at High Island, 6,000 people visited the sanctuary over a 2 month period in 1995. These bird enthusiasts came from 5 foreign countries and 45 domestic states.

Some birds commonly seen in Galveston Bay include the cormorants, white ibis, laughing gull, herring gull and ring billed gull. Some of the endangered and threatened species of birds that have been sighted in Galveston Bay include:

On the Federal Endangered List:

Brown Pelican ***Pelicanus occidentalis***
Attwater's greater prairie chicken ***Tympanuchus cupido attwateri***
Whooping crane ***Grus americana***
Eskimo Curlew ***Numenius borealis***

On the Federal Threatened List:

Bald Eagle ***Haliaeetus leucocephalus*** (Was proposed for delisting in 1999)
Piping plovers ***Charadrius melodus***

On the Texas State Threatened list:

Reddish Egret ***Egretta rufescens***
Wood Stork ***Mycteria americana***
Peregrine falcons ***Falco peregrinus***

Pictures of endangered species are courtesy of the Texas Parks and Wildlife Department web site.