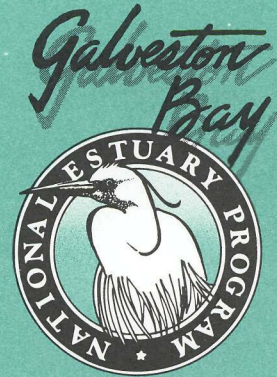


The History of Galveston Bay Resource Utilization



Galveston Bay
National Estuary Program

GBNEP-39
January 1993

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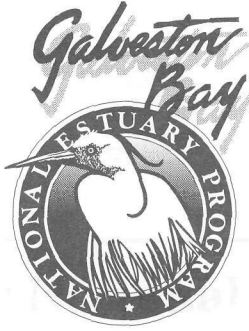
Prepared by

Margaret Swett Henson

The Galveston Bay National Estuary Program

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Introduction

Galveston Bay has received attention from ecology-minded popular writers and science-oriented students and professionals, but this effort by a historian explores how people have used the complex estuary since the earliest times. Such a history is a challenge and has led the writer into scholarly reports from many fields.

History, of course, relies on the judicious use of primary documents ranging from official records, to private correspondence, diaries, and memoirs, to books and newspapers, and more recently to oral and video interviews. Using documents written by participants and eyewitnesses whenever possible, the author, with the aid of colleagues expert in other fields, has compiled an overview of human activity in the bay area over a period of perhaps 14,000 years.

For the first 12,000 years, there were no written records and conclusions rely on what archaeologists have found and how it has been interpreted. When the first Spaniards visited the area in 1528 it was by accident, but a written account published in 1542 tells a great deal about the lifestyle of the indigenous nomads. Their simple use of the bay, primarily as a source for food, continued for almost three hundred years because the Spanish saw little of value along the Texas Gulf Coast and left it alone. French and Spanish documents reveal that a few French traders from New Orleans visited the bay in the 1700s to trade with the native population. This was a first step in using the bay for commerce: easy water transportation allowed traders to reach inland sites.

The nineteenth century brought dramatic changes in the use of the estuary: increased population and the exploitation of the bay stimulated by changes in technology. Political changes brought an influx of settlers from the United States in 1822, and within four years, the native people who had visited the bay annually were driven away or exterminated. The bay system became a means of transportation for newcomers and a way to market for agricultural produce.

The settlers immediately changed their frontier homes into replicas of those they had left. They replaced native plants and animals with domestic varieties which affected the ecology. Bay fishing continued for local use until the end of the 1800s when technology changed; mechanical ice and improved transportation led to commercial fishing. Merchants and shippers demanded deeper and straighter channels for the ever-increasing size of vessels entering Galveston Bay.

By the end of the nineteenth century, the bay was damaged by exploiters. Over harvesting threatened certain species, dredging channels and building jetties was changing water flow, and careless attitudes about dumping human waste into the waterways endangered

marine and human life. Increasing population in the twentieth century and industrialization around the bay compounded problems when underground water was extracted in great quantities resulting in subsidence. In the same uninformed mode, industrial wastes were discharged into the air, soil, and water.

Growing concern about all kinds of pollution led the federal government to enact laws to reverse the trend in the late 1960s. Progress has been made in cleaning up human and industrial wastes and marine life is improving. People who use and rely on the bay for their livelihood and leisure, continue to worry and work for more improvement to balance the needs of the various groups who want to use and enjoy the great estuary.

The Formation of the Galveston Bay Ecosystem, the Indigenous People, and the European Intruders Pre-history to 1800

Pre-history

While archaeologists cannot pinpoint the year when humans first visited the Galveston Bay area, it may have been about 12,000 B. C.-or as many researchers prefer, 14,000 years B.P., "before the present." These Paleo-Indians were big-game hunters-woolly mammoths, mastodon, and large bison and other ancient animals (Few, 1991:16, 18). It was a colder and wetter climate, and Galveston Bay had not yet taken its present shape. The shore line was perhaps fifty to one hundred miles farther out in the Gulf on what is now called the continental shelf. Experts disagree as to when the shore line receded and the bay took its present shape but it was sometime between 4,500 to 5,000 B.P. (Few, 1991:10, 23; Pearson, 1992).

Geologists and archaeologists can tell where the original river valleys, deltas, beaches, and lagoons were by taking core samples through the various layers of soil on shore and more recently on the continental shelf. Geologist Rufus J. LeBlanc explains that 30,000 or more years ago the sea levels dropped during the Ice Age and streams became more deeply entrenched across what is now the continental shelf. When the glaciers began to melt, the sea levels rose, gradually drowning the old entrenched river valleys and created estuaries and bays such as the San Jacinto, Trinity, and Galveston bays. While rivers like the Brazos, Rio Grande, or the Mississippi have filled their estuaries with silt and often have delta-like entrances, the Trinity and the San Jacinto rivers are still silting their estuaries (Few, 1991:1, 4), although at a slower rate because of dams now on these rivers. Thus the Galveston Bay area is a still-changing ecosystem even without man-made alterations that sometimes hasten the process.

Beginning in the 1970s archaeologists began speculating that the continental shelf would have intact archaeological evidence of aboriginal occupation. Having explored onshore middens (trash piles of ancient campsites), they projected what might be found offshore. Under the auspices of the Minerals Management Service of the U. S. Department of Interior, the archaeologists tested the theory off the Texas coast between High Island and the Sabine River. Seismic data and vibracore samples (continuous cores up to 40 feet long) yielded geological information about the layered formations. As expected, the clay strata were interspersed with evidence of fresh and brackish water organic deposits indicating pre-inundation conditions. At certain levels grass and pollen samples appeared along with charred wood, nut hulls, seeds, fish scales, and bone, some of which was carbonized. Radiocarbon testing suggests that these organic deposits date around 8,000

B.P. While none of the evidence proves human occupation, the findings are similar to many onshore middens and seem to provide evidence of people living on the continental shelf (Pearson, 1988:26-30).

During the Paleo Indian period, between 9,000 and 14,000 B. P., the nomads followed the herds of animals. Each band had perhaps thirty members, but the small groups joined together to hunt the larger game. Such a foray required planning and cooperation of many individuals because the attack was by close-quarter stabbing or throwing. The hunters used spears, lances, and darts tipped with well-made fluted points (concave in the lower portion and base) called "Clovis" and "Folsom" points depending on their style. These points were flint or obsidian—evidence of an extensive trading network because such stones do not exist around Galveston Bay. These ancient people not only ate the meat from their kill but also used the skins, bones, tusks, and horns for clothing, storage bags, shelter, tools, and weapons (Few, 1991:18-19).

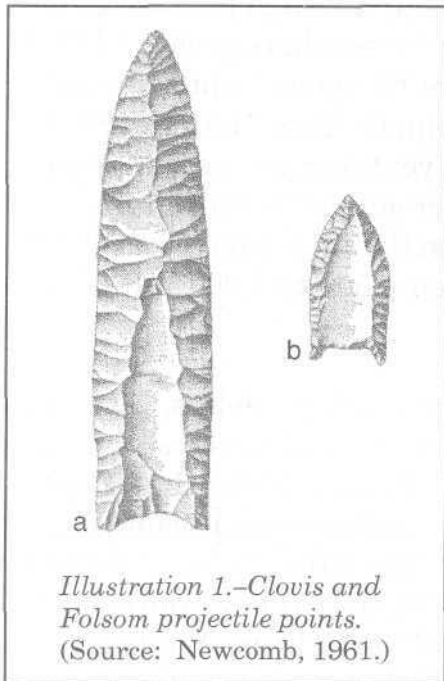
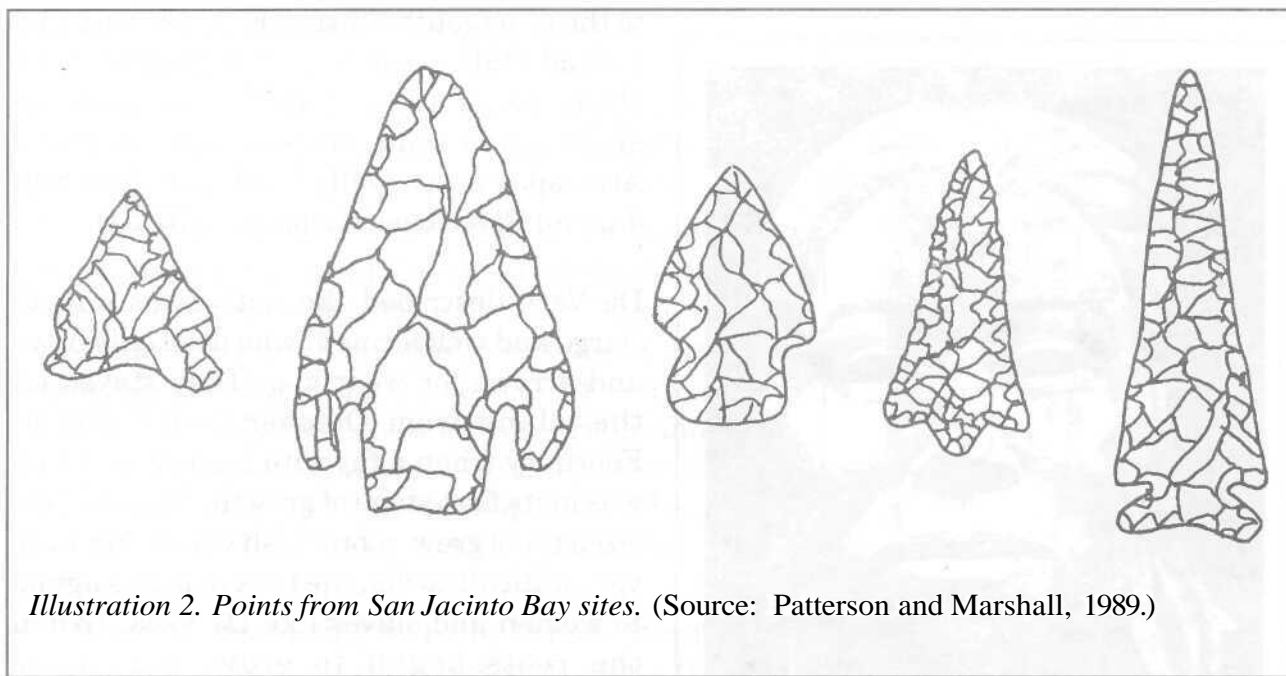


Illustration 1.—Clovis and Folsom projectile points. (Source: Newcomb, 1961.)

During the late Pleistocene period just before 8,000 B.P., those shadowy Paleo-Indians roamed around the waters that became Galveston Bay hunting the large animals that grazed the extensive grassland. Archaeological remains found on the Texas City Dike indicate not only mammoth, mastodon, and *Bison antiquus* foraged in the vicinity, but also prehistoric camels, horses, armadillos, tigers, and sloths frequented the area. The dike, a man-made barrier to protect the harbor, was dredged in the 1930s from Galveston Bay and evidently in the valley of one of those ancient rivers. The dike has also yielded bones of animals more familiar today such as wolf, bear, rabbit and so forth. Among the fossils were marine creatures such as turtles and manatees. Some of these bones seem to show butcher marks while others appear to have been altered for use as tools (Texas City Dike Fossil Collection 1991; Few, 1991:19).

About 8,000 years ago the Archaic Period began, a time period lasting for about six thousand years. This was when the big animals began disappearing and point technology changed from the large lance-type to smaller spear and dart points that usually had stems and bases for ease in attaching to the shaft. Sometimes the edges of these more refined points had beveled edges. While Paleo-Indians may have used the atlatl (spear-thrower), it became common during this period, allowing hunters greater accuracy and distance. The nomadic hunters and gatherers continued to follow game and collect the seasonal fruits, berries, and nuts. They traveled in bands, often family groups, and continued to visit the Galveston Bay area (Few, 1991:20-21).

Galveston Bay hunters and gatherers continued to improve their life style. By 100 A.D., or 1,900 years B.P., area visitors began making pottery from local clay which provided more convenient ways to store and cook food. Some pottery makers decorated the rims with geometric designs before firing and some archaeologists informally call this period, 100 A.D. to 1528 when the first Europeans arrived, the "ceramic period." Most refer to it as the late Prehistoric. These seasonal residents continued a nomadic lifestyle and seem not to have discovered the advantages of planting and harvesting crops as did certain contemporary groups in the Mississippi River valley and the Southwest. About 1,400 years B.P., weapon technology changed again when hunters began using bows and arrows. Archaeologists also find stone, bone, and shell tools such as drills, scrapers, knives, and other conveniences at numerous sites around the bay and its waterways. Sea shells were also used for personal decoration and when traders visited inland sites, shells were a valuable commodity to exchange for woodland products. Bone sometimes was shaped into gaming pieces and flutes suggesting both recreational and perhaps ritual use (Few, 1991:20-22).



In sum, the earliest people used the bay area as a hunting ground for the necessities of life. Land, air, and marine life provided food and the residue was used for making shelter, clothing, tools, and decorations. The shore itself and its plants also contributed towards the comfort of these early residents. Their trash piles—mostly oyster shells during the Paleo-Indian era and after 4,000 B.P., rangia clam shells—dotted the shores of the waterways indicating some thought about the disposal of garbage (Pearson, 1992).

The First Europeans: Spaniards, 1528

With the coming of the Spanish in 1528, the first written record about Texas coastal Indians appeared. A group of Spaniards had landed near Tampa Bay on Florida's west coast in April, 1528 and unwisely decided to explore northward where hostile natives and hunger devastated the party. In order to survive, the men built five crude sail boats and with scanty provisions left the Pensacola area for Mexico which they thought was nearby. A storm cast them ashore on the Texas coast near Galveston Island in November where the natives fed them but made them slaves. Alvar Nunez Cabeza de Vaca was one of only four survivors who reached a Mexican outpost in 1536. He published his account in Spain in 1542 detailing the ill-fated venture and also described the appearance and culture of the natives he had encountered.

Two similar bands frequented the island of Malhado [Bad Luck], De Vaca's name for the island where they landed, possibly Galveston Island, but spoke separate languages: Capoque and Han. Researchers speculate that the Capoques were ancestors of the nineteenth century Cocos who lived southwest of the Brazos River and who were related

to the nineteenth century Karankawas who visited Galveston Island annually. The Hans seem to be the forerunners of eighteenth and nineteenth century Attacapas who usually lived east of the San Jacinto River basin (Hodge, 1907:54).

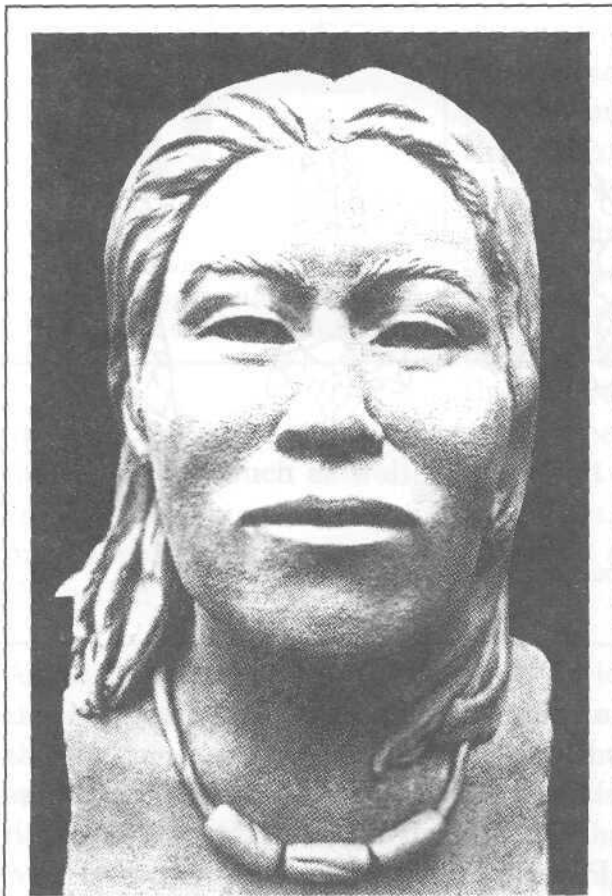


Illustration 3a.-Sculpted Head of Galveston Island Aboriginal from Jamaica Beach Skull c1500. (Source: Few et al, 1990.)

De Vaca described the natives as naked, "large and well formed" who used only bows and arrows for weapons. They stayed on the island from October to the end of February when a favorite underwater root was in its first stage of growth. The walnut-sized roots grew in brackish water and were very difficult to dig, the task being assigned to women and slaves like De Vaca. When the roots began to grow, they were unpalatable and the nomads left the island (Hodge, 1907:50). With the roots, the natives served the Spaniards large quantities of fish, perhaps caught in woven cane weirs or shot by arrows. They did not have hooks (Hodge, 1907:45). When the band was ready to leave the island, the women loaded their belongings into canoes and paddled to the mainland. They camped

on a bay for three months eating oysters until about May when they went to the coast for blackberries (Hodge, 1907:52). The nomads seem to have understood the rhythm of seasonal harvests.

One can speculate that they ate other things that were forgotten by the surviving Spaniards. At this time shell fish, alligator, and turtle were often taboo food for Christians so perhaps De Vaca failed to mention such fare on Malhado. Two other Spaniards, slaves of another band, complained that they had to survive on crabs and rockweed, which a translator interpreted to be kelp (Hodge, 1907:61). At first the starving Spaniards occasionally resorted to pragmatic cannibalism by eating their dead, a not uncommon European practice among castaways, but the coastal natives did not eat human flesh in 1528 and seemed outraged by the practice (Hodge, 1907:63).

After a year as a slave on the island, De Vaca became a trusted trader and faith-healer and was allowed to travel to the mainland to trade with the Charruco. They lived in the forest which could have been along any of the streams emptying into Galveston or West bays or even the Brazos River. De Vaca traded seashells used to make tools, sea-beans used as medicine, and other marine objects for skins, ocher, hard canes for arrows, sinew for bowstrings and other binding, some sort of adhesive to attach arrowheads to the canes, and flint for the weapons (Hodge, 1907: 56). When visiting the inland bands, De Vaca noted many birds and animals including bison which he called cattle, not having seen any before. Bison flesh was fine, he said, and the hides very useful (Hodge, 1907:68).

Finally in 1534, the handful of remaining Spaniards plotted an escape during the annual gathering of all the bands at the pecan groves in the river bottoms. The natives ground the pecans into a meal-like consistency seemingly to be stored (Hodge, 1907:57-60). Some groups also traveled to areas rich in prickly pears to eat the purple tunas (fruit) that



Illustration 3b.-Two drawings cl 700s of Attacapas. (Source: The American Heritage Book of Indians, 1961.)



line each pad (Hodge, 1907:61). There is no mention of using the flat green pads as Mexican cooks do. The natives had dogs but De Vaca said nothing about eating them (Hodge, 1907:44, 64). Some of the Spaniards were with groups that killed deer, but when starving, the disgusted Spaniards remembered that the natives ate ant eggs, insects, reptiles, and dung (Hodge, 1907:65).

De Vaca's account relies on his and the other three survivors' reminiscences after their rescue in 1536. They had lost their possessions and had no means of keeping journals. Like all travelers in exotic lands, they were amazed and shocked by some of the native practices and thus the unusual and outrageous was recalled and recorded while the ordinary was often omitted. But from this first European record, it is clear that the indigenous people utilized Galveston Bay in a sensible manner according to their culture. Nomads could enjoy whatever food was available, and with shelters made of matting and poles, could load their belongings into canoes for easy transport to a new site.

De Vaca's negative report describing the low level of culture among Texas coastal people and the lack of valuable gold, silver, or precious stones resulted in discounting the value of the area. No Spaniards returned to Galveston Bay until the last half of the 1700s but Spain diligently searched out intrusions by other Europeans, especially the French, who visited or tried to occupy the Texas Coast. Spain, of course, claimed the Western Hemisphere by right of Columbus' voyages, a pretension confirmed by the Pope in 1494 who awarded unclaimed land west of eastern Brazil to Spain and all new lands to the east (including Africa) to Portugal. Spain, however, could not defend all of her empire from her European rivals.

The French Threat and Spanish Response 1685-1690

French explorers had occupied the St. Lawrence River in the early 1600s and added the Great Lakes to their empire by 1682 when Rene Robert Cavelier, the Sieur de la Salle, descended the Mississippi River. He claimed its entire basin for France, thereby intruding upon Spain's unoccupied land bordering the northern Gulf of Mexico. France wanted to establish a base near the mouth of the Mississippi to prey on the annual Spanish treasure fleet and possibly invade northern Mexico to capture the mines. But LaSalle was unable to pinpoint the exact latitude of the entrance to the Mississippi because the instruments of the day were too crude (Weddle, 1973:1-3, 16-23). This lack of technology caused him to miss his intended landing when he returned by sea in 1685.

La Salle left France with four ships but Spanish corsairs seized one in the Caribbean Sea. The Spanish authorities learned about the intended French colony from these seamen and also from French deserters after La Salle reached Santo Domingo (Haiti). Spanish officials puzzled for a year over where "Micippi" was and decided it emptied into a bay an early explorer had called "Espiritu Santo" somewhere between Apalache

[Tallahassee] and Tampico. A vessel was sent from Havana to explore the Florida coast in January 1687 but it passed the mouth of the Mississippi River without notice. The Spanish found no Frenchmen and sailed to Veracruz in March (Weddle, 1973:24-25, 29, 47-52).

Meanwhile, La Salle had sailed past the Mississippi and landed in Matagorda Bay assuming that the big river emptied into the bay. After building a fort on Garcitas Creek near the mouth of the LaVaca River on the northwest corner of the bay, he explored by land as far as the Rio Grande. In January 1687, about the time the Spanish had launched their coastal search, La Salle and a small party set off north east looking for the Mississippi River. He hoped to find a French outpost because his colonists needed supplies. The French leader was killed by his own men near the Navasota River and within two years, Indians attacked the tiny fort and massacred all of the adults (Webb, 1952:11:31-33).

Determined to find the intruders, the Spanish also launched a search by land from just below the Rio Grande. Between 1686 and 1690 Capt. Alonzo de Leon made five overland trips looking for the French. On his last expedition, De Leon found the ruins of the fort and burned what little remained. Acting on orders from his superiors, he marched northeast over Indian trails to establish a mission as evidence of Spanish hegemony. A wooden compound, San Francisco de los Tejas, was built in Houston County southwest of present-day Nacogdoches and was the only Spanish settlement in what is now Texas except for the El Paso area. The tiny isolated mission was abandoned in 1693 but was re-established in 1716 when a second French intrusion, this time from the Natchitoches area, again stimulated Spanish reaction (Webb, 1952:1:483-84).

Spanish Neglect of the Gulf Coast and French Claims to Galveston Bay 1720-1756

By 1690 Spain was a declining European power in part because of defeat of the Spanish Armada by the English in 1588. Its treasure ships from the New World were often seized by enemies and it had little money for costly exploration or settlement along the northern Gulf coast, an area considered worthless. The French took advantage of Spain's neglect and occupied Mobile and Biloxi between 1699 and 1702 and founded New Orleans in 1718. In 1714, Louis Juchereau de St. Denis established a trading post at Natchitoches on the Red River to exploit trade with Indians in Spanish Texas. Thus the Spanish soldiers and missionaries once again traveled the old inland Indian trails to re-establish hegemony by building a mission and presidio in 1716 at present-day Nacogdoches and a similar way-station at the Alamo in 1718. In 1721 the capital of Spanish Texas was placed east of the Sabine River at Los Adaes, a presidio complex built just fifteen miles west of French Natchitoches. Even so, the lower Trinity remained unexplored until 1745 and Galveston Bay uncharted until 1785.

By 1714, the governor of French Louisiana began looking for the site of La Salle's fort, which was presumed to be on a bay called by the Spanish "San Bernard." The French, of course, considered it theirs by La Salle's occupation (Cadillac, 1714). Maps of the period were poor, and Galveston Bay looked like it might be the obscure Bahia de San Bernardo.

The first French ship to stop in Galveston Bay did so by accident. The *Marechal d'Estree* sailed from France in August 1719 and reached the Louisiana coast by October with soldiers assigned to the area. The inept captain sailed past the entrances to the Mississippi River and reached Galveston Bay. Needing fresh water, the vessel anchored offshore and sent a boat to sound for a channel. Finding only seven or eight feet of water, the captain sent in small boats with casks to be filled, but the water proved brackish. Leaving the bay and continuing west, the navigator finally convinced the captain that he was heading for Veracruz and trouble. Returning eastward, the captain decided to enter the unnamed bay and the vessel immediately ran aground. The ship was saved by having the crew run back and forth across the deck while hoisting all sails to catch the offshore wind (Folmer, 1940:205-09).

Not knowing where they were and desperate for supplies, five military officers, including twenty-four-year-old Simars de Bellisle, volunteered to go ashore thinking that they would reach a French settlement in a few days and send a relief ship. The next day the five discovered that their ship had abandoned them. For several weeks they roamed the area living off the land by shooting deer and birds and gathering oysters until they ran out of ammunition. All died except Bellisle. He survived by eating anything, including grass and worms from rotting trees (Folmer, 1940:209-215).

Finally he saw three natives searching for bird eggs on an island in the bay and he rowed out to meet them in the small boat he had found washed up on the shore. They took his possessions but in return gave him eggs and fish that they had caught. They took him to their camp on the mainland [below Anahuac] where their families were and fed him boiled "potatoes," perhaps the same roots mentioned by De Vaca. He spent the entire summer [1720] with this band of Indians that he called the Caux. They had no "cabins or fields" and continually searched for food. The men killed deer and buffalo and the women harvested the roots (Folmer, 1940:215-216). Professor Herbert E. Bolton identified these Indians as 18th century Attacapas, a family that not only included the Louisiana Attacapas but the Texas Bidai, Orcoquiza, and Deadose (Bolton, 1915:3, 36).

At the end of summer, the Indians packed their belongings into "pirogues" and headed to "the end of the bay," a trip of a week, where they joined others. Bellisle was a slave and gathered wood, carried water, and dug potatoes. Learning that there was a white man [St. Denis at Natchitoches] with whom they occasionally traded, Bellisle wrote a letter on a scrap of paper and begged them to give it to the Frenchman. In the interim, Bellisle accompanied the hunters to the prairies to kill buffalo and also engage in warfare. The natives mounted their horses [this is the first mention of horses in the Galveston

Bay area] while Bellisle had to trot along behind carrying some of the baggage. They came upon a herd of 80-100 bison and killed 15-16 animals by shooting arrows from horseback. A war party returned with a dead enemy whom they butchered and ceremonially ate portions of the body. When they returned to their camp, two Indian emissaries from St. Denis arrived to escort Bellisle to Natchitoches where he arrived February 10, 1721 and reached the French governor in Biloxi soon afterward (Folmer, 1940:219-225).

While Bellisle was still a prisoner in 1720, Capt. Jean Beranger was sent from Biloxi in August to occupy "St. Bernard Bay." He was unable to enter Galveston Bay because of high water and adverse winds but found another bay [Matagorda] to the southwest and sailed in. He planted a French plaque and left five men on the shore before returning to Biloxi (Folmer, 1940:226-227).

Meanwhile, Jean Baptiste Benard de la Harpe was named commander of St. Bernard Bay in November, 1720, in Paris and reached Biloxi in the spring. He sailed for Galveston Bay in August 1721 on board the *Subtile* with Beranger as ship captain and Bellisle as interpreter. Bellisle met the same Indians on the shore who had enslaved him two years earlier. La Harpe wanted to establish a trading post in the vicinity, but the Indians were adamantly against it (Folmer, 1940:227-230).

La Harpe and Bellisle explored the bay in a canoe along with a surveyor and ten soldiers. Some of the Indians followed them in pirogues while others skirted the shore on horseback. The Frenchmen entered the Trinity River and noted the fine prairie and forests on the high banks. The natives entertained the French in their camp offering grain, roots, and smoked meat. La Harpe described the 150 villagers as "well-formed" with "regular features." Six pirogues with ten men each visited the *Subtile* where the French demonstrated the cannon and other firearms. After giving them a dog and some chickens (and instructions for their care), the French put them ashore except for nine men. They took one elderly chief and eight young men to Biloxi in October in order to convince them of French power. In some manner, the nine escaped and made their way back home (La Harpe, 1971:176-182). Two months later La Harpe abandoned his project on Galveston Bay leaving the Indian trade in eastern Texas a monopoly of St. Denis at Natchitoches (Bienville, 1721 & 1722).

One result of La Harpe's voyage was maps. One is the "Carte de la Coste de la Louisiane" showing the Baye de St. Bernard and another is the "Plan due Port decouvert dans le Golfe du Mexique le 21. d'Aoust 1721...", the earliest known map of Galveston Bay. One cartographic expert considers the latter more accurate than the Spanish maps published after 1799 (Taliaferro, 1988:70-71).

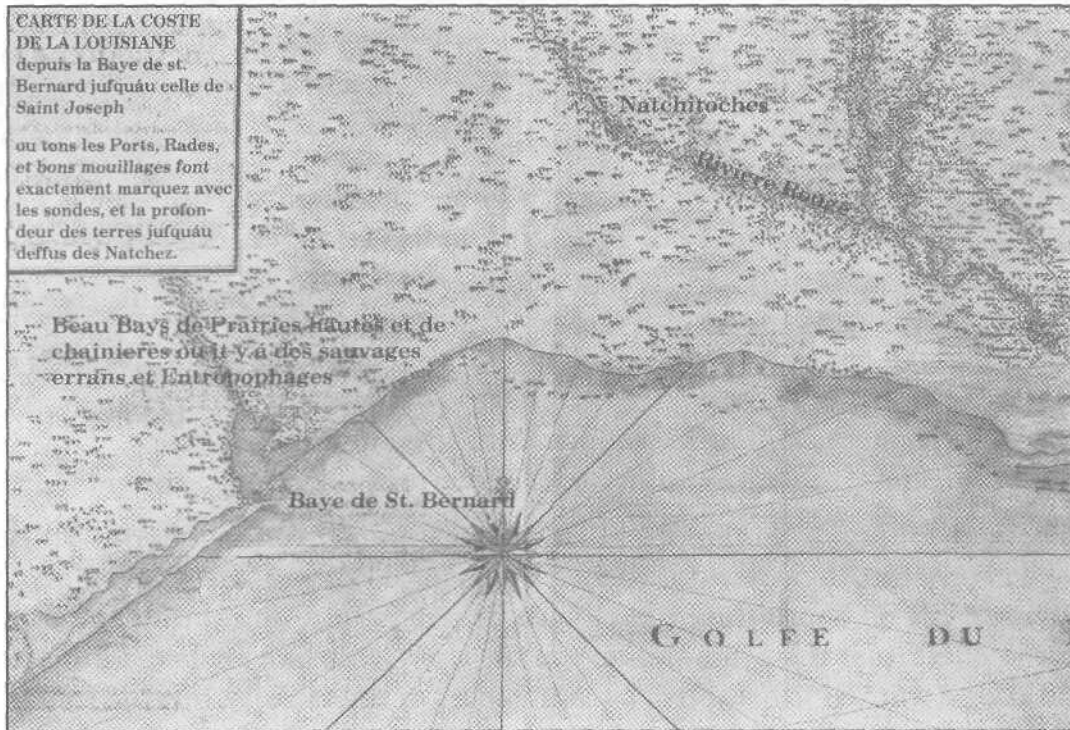


Illustration 4a.-Carte de la Coste de la Louisiana. (Source: Folmer, 1940.)

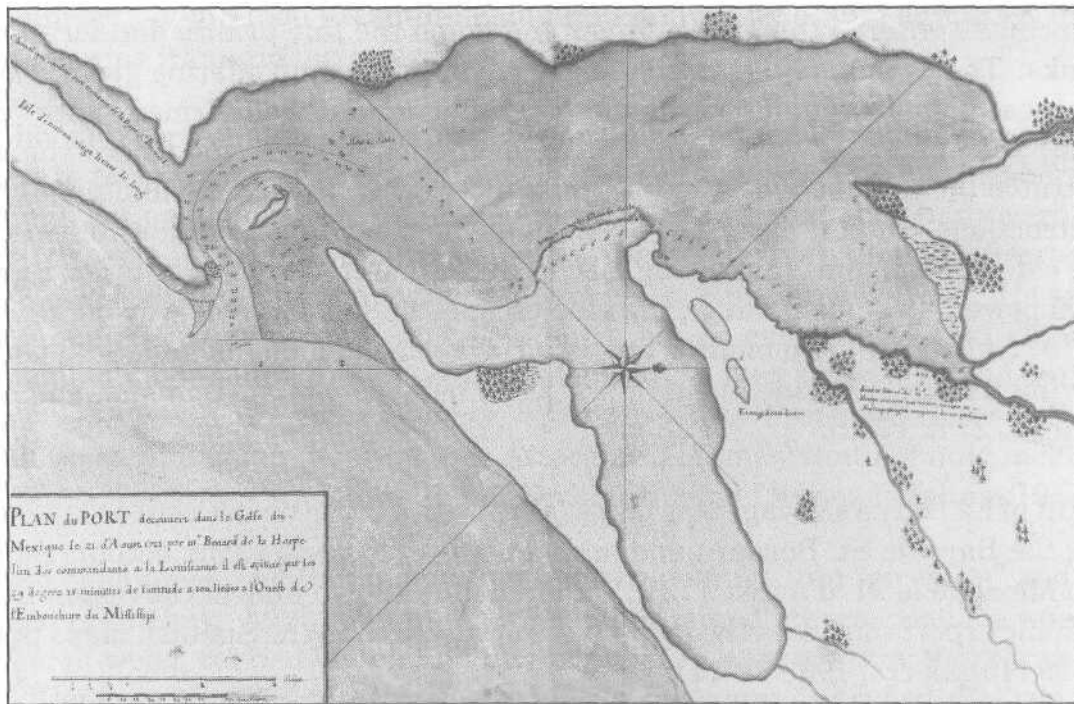


Illustration 4b.-Plan du Port decouvert dans le Golfe du Mexique le 21. d'Aoust 1721 par mr. Benard de la Harpe (1725). (Source: Rosenberg Library, Galveston Texas)

Even though the French relinquished the idea of a post on Galveston Bay, individual French traders began entering the bay by 1730 to trade with the Orcoquiza villages on the lower Trinity and San Jacinto rivers. Like La Harpe, they anchored their schooners in the bay and ascended the rivers by canoe or pirogue. A pirogue can be a simple flat canoe pointed on both ends or a larger shallow-draft sailing canoe capable of being rowed. Thus by the 1730s, the bay was changing from a focus for food to being a means of transportation—at least for French traders.

In 1746, responding to rumored French trading activity on the Trinity River, Capt. Joaquin de Orobio Bazterra of La Bahia [Goliad], was ordered to investigate immediately. His efforts demonstrated that Spain still had no knowledge of the coastal area east of Matagorda Bay. In October he started down the Guadalupe River intending to march along the coast, but high water and rough country convinced him he needed to build canoes. That project was abandoned in December when he and twenty-one soldiers started up the old Spanish road to the crossing on the Trinity River. There they planned to follow the river to its mouth. But upon reaching the Trinity in January, Orobio Bazterra discovered that local Indians knew nothing about a road leading south so the party continued to Nacogdoches. The priest knew about a Bidais trail that led south through what is now the Big Thicket. Recently, he said, fifteen shipwrecked Frenchmen had come up the trail and passed the mission enroute to Louisiana. Unsure of what to do, Orobio Bazterra marched another fifty miles eastward to Los Adaes to consult with the governor of Texas. In February the captain returned to Nacogdoches, found a guide, and started south over the Bidais trail. He was the first Spaniard the Bidais had seen; the same situation occurred at two Orcoquiza villages near Spring Creek in northern Harris County. These Indians told him that the French had been visiting the area for six years and had recently named a site on the lower San Jacinto River as an annual trading post for bear, deer, and buffalo skins. Orobio Bazterra then headed home traveling northwest through the wilderness until he struck the *camino real* leading to La Bahia. He reached home in April (Bolton, 1970:328-332).

Spaniards seldom were traders like the French, but in 1751, the governor at Los Adaes unofficially became the head trader to serve southeastern Texas. He quietly bought goods in Natchitoches or New Orleans from his French enemies and used his troops to deliver the merchandise to the Indian villages on the San Jacinto and Trinity rivers. His lucrative contraband trade was threatened in 1754 when Joseph Blancpain, a French trader with the Attacapas in Louisiana, arrived by boat in Galveston Bay. With two partners, Blancpain built a trading post on the south shore of what is now Lake Miller which drained into the Trinity River just above the Interstate Highway 10 bridge in Chambers County. This was the site of an ancient Indian village. Blancpain put up warehouses and even built a wharf. As soon as the Spanish governor learned about the French trader, he sent a squad to arrest the intruders. Blancpain was taken to Mexico City where the xenophobic Spaniards decided he was an agent sent to extend French

rule over southeastern Texas. The Frenchman died before he could be sent to Spain for further interrogation (Bolton, 1970:336-339).

The Spanish response was typical: a mission and presidio were established at El Orcoquisac in 1756. Personnel and supplies were drawn from both northeastern Texas and from the San Antonio area—all traveling over the *camino real* and down through the Big Thicket. No Spaniard had yet explored Galveston Bay! The mission Nuestra Señora de la Luz attracted a few Indians who were willing to receive food and clothing but who refused to live inside the compound. They remained in their nearby villages sometimes helping the priests with crops and building projects. A few were baptized. The priests and soldiers complained about the bad water, the insects, and the lack of supplies reaching the remote outpost. An inspection in 1767 reported the presence of thirty-one cavalymen and two priests, but no converts. The authorities closed the complex in 1771 and sent the missionaries and soldiers to San Antonio in a move to reduce expenses (Bolton, 1970:342-358;372-374).

The Spanish outposts in eastern Texas were no longer needed because France had lost Louisiana in 1763 at the close of the Seven Years War (French and Indian War). Spain received French land west of the Mississippi River plus New Orleans while the British claimed the eastern bank. The capital of Texas was moved to San Antonio, but Spain was not eager to allow strangers to settle in eastern Texas. The former French traders, now Spanish citizens, continued to trade with the Texas Indians and a great deal of smuggling took place through Nacogdoches, Natchitoches, and Natchez—especially livestock from south Texas ranches driven eastward. Although both Texas and Louisiana were Spanish, Louisiana retained its French culture and was governed from Havana while Texas was administered from Mexico City. Each maintained its own protective tariffs.

Finally in 1783, Bernardo de Galvez, the Spanish governor of Louisiana, ordered a survey made of the entire Gulf coast from Florida to Tampico. He chose Jose Antonio Evia, a graduate of the Royal Naval School and long-time naval officer in the Gulf, to explore and map the rivers, inlets, and bays. By the time Evia sailed in 1785, Galvez had been named Viceroy of Mexico and the intrepid captain wisely named the deep bay on the Texas coast and its island for his patron. His charts and diaries were used by the Hydrographic Service in Madrid for a map published in 1799 as "Carta Esferica...las costas del Seno Mexico...(Branda, 1976:287). Galveston Bay is labeled for the first time. A copy of this map and a slightly edited 1807 version are at the Rosenberg Library, Galveston.

By the end of the century, citizens of the new United States were pushing westward and in 1803 acquired Spanish Louisiana which had been reclaimed by the French. The aggressive Anglo American expansionists would soon be exploring Galveston Bay.



Illustration 5.—Carta Particular de las Costas Setentrionales del Seno Mexicano (1807).
 (Source: Rosenberg Library, Galveston Texas)

From a Food Source to a Conduit for Settlement: The Bay During the Struggle for Mexican Independence, Anglo American Colonization, and the Republic of Texas, 1810-1845

Events in the early 19th century brought political changes to Galveston Bay and saw the demise of the native population. Mexican reformers declared their independence from Spain in 1810, but the movement quickly became guerrilla warfare against royal troops while the Spanish viceroy controlled Mexico City until 1821.

Galveston Bay, however, became a staging area for a number of adventurers including Mexican republican sympathizers, privateers, and even a band of Napoleonic refugees hoping to liberate the Emperor from exile on St. Helena Island. While these European and Anglo American filibusters and pirates stayed mainly along the coast, their presence doomed the annual visits to the shore by Karankawas and Orcoquizas.

Military Adventurers and Privateers

In November 1815, Gen. Jean Joseph Amable Humbert and fifty men left New Orleans to join Henry Perry and a group of Anglo American veterans of the War of 1812 on Bolivar Peninsula. They built a fort on a high point, perhaps an ancient shell midden, on the bay side where they spent the winter. They were waiting for supplies and reinforcements in order to attack the Spanish outpost at La Bahia [Goliad] (Warren, 1943:130). A number of Perry's men were veterans of the American victory over the British at New Orleans earlier that year. Some had also participated in the 1812-1813 Gutierrez-Magee expedition, a joint endeavor of Mexican republicans and American adventurers, intent on defeating Spanish royalist outposts in Texas. They captured Nacogdoches, La Bahia, and San Antonio but in August, 1813, were defeated by the Spanish army southwest of San Antonio. The survivors scurried back to Louisiana to plot future invasions of Texas. While Perry's men awaited orders in 1816 to again attack Spanish outposts, they passed their time exploring the land around Galveston Bay for homesites that they expected to receive as their reward from the future Mexican republic (Henson, 1982:26-27).

About this time a Spanish-speaking mapmaker drew the bay and its environs placing a row of "casas" [houses] on the bay-side of "Isla de Culebras" [Snake Island], recognizable as Galveston Island. The modern Galveston channel appears as Puerto de Galveston and has three anchorages noted near the eastern end. The tip of the island was separated and another anchorage appears near Bolivar on the bay side. Punta de Orcoquizas

[Point of the Orcoquisa Indians] is the name given to the tip of the peninsula which is also labeled as the site of Humbert's camp. A note says that the road from "Punta Humbert" to the Orcoquisa village near the mouth of the Trinity was easy to follow. Someone marked the depth of the water over Red Fish bar although it was as yet unnamed (see Illustration 6).



Illustration 6.-Galveston Bay (c1816).
(Source: Rosenberg Library, Galveston Texas)

Others arrived on Galveston Island in 1816, including privateersman Luis de Aury who had formerly served against the Spanish with Simon Bolivar in Venezuela and Colombia. It was Aury who named the prominent peninsula "Bolivar" for his hero. Humbert had abandoned the project but Perry's men joined Aury on the island. The Mexican republicans-in-exile in New Orleans named Aury civil and military governor of the province of Texas, established a port at Galveston Island, and an admiralty court where privateers-men with letters of marque and reprisal could dispose of merchandise taken from Spanish ships. These legalities made them privateersmen, not pirates, at least in their own eyes. Within months, Xavier Mina, a Spanish republican fleeing royal punishment in his homeland, brought 300 inter-national

volunteers to Galveston and a plan to invade Soto la Marina located on the coast between the Rio Grande and Tampico. Aury ferried the invasion force to the chosen spot in April 1817 but refused to participate in the invasion (Bancroft, 1889:11:34-37).

While Aury was cruising, Jean Lafitte, another privateer, arrived from New Orleans to occupy the strategic island. The former Lafitte camp at Barrataria near New Orleans had been destroyed by the governor of Louisiana in 1814, but Lafitte and his men nevertheless rallied to the American cause when the British threatened New Orleans at the end of the year. For his service, Lafitte was pardoned for past piratical acts. Thus Galveston Island, outside of the United States but close to Louisiana markets, was an attractive refuge. Lafitte organized a government whose officers swore allegiance to the

Mexican republicans. He held letters of marque to prey on Spanish shipping, but he also managed to be paid by the Spanish governor of Texas for reporting incursions of foreigners (Webb, 1952:11:5-6).

In January and February, 1818, generals Antoine Rigau and Charles Lallemand arrived from the United States with a group of Napoleonic exiles seeking a staging area for a grand scheme to rescue the Emperor from St. Helena and put him or his brother, Joseph Bonaparte, formerly ruler of Spain, on a Mexican throne. Lafitte helped them cross the bay and enter the Trinity River in March where they built a fortified camp near present-day Moss Bluff. Lafitte then informed the Spanish governor of their presence. The French drilled and planted crops at Champ d'Azile, but the bad water, mosquitoes, and word that the Spaniards were marching against them drove the exiles back to Lafitte's island in July. Before they could return to the United States, a severe hurricane struck Galveston in September destroying the town of shanties that had developed on the bay shore (Gardien, 1984:241-268). Campeachy, Lafitte's settlement, had between 100 and 200 houses, stores, boarding houses, and a billiard parlour before the storm, according to eyewitnesses (Gulick, 1927:3:232; Franks, 1883; Campbell, 1884).

Sometime between 1817 and May 1820 when Lafitte abandoned the island at the request of the United States, his men had a violent encounter with the visiting Karankawas. The details are few, the story having been passed by word of mouth until recorded by Henderson Yoakum in 1855. Legend says that the pirates kidnapped an Indian woman and in revenge, the natives killed four men. In retaliation, Lafitte's men organized a raid on the Indian camp at Three Trees, the notable landmark on the bay side between present-day Pirate's Cove and Galveston Island State Park. Supposedly 200 pirates attacked 300 Indians with two pieces of artillery. While some of the pirates were wounded by arrows none were killed during the encounter but they killed 30 Karankawas and wounded many others (Yoakum, 1855:1:197). Subsequent historians have copied Yoakum although his numbers seem inflated. The Karankawas, however, did not abandon their annual visits to Galveston Island because later accounts recorded that they endured a second attack by James Long's men in 1820.

Dr. James Long, also a veteran of the Battle of New Orleans, became a planter and storekeeper near Natchez after the war. Long and his friends were incensed in 1819 when the United States gave up its tenuous claim to Texas. Many believed that the 1803 Louisiana Purchase included Texas as far west as Matagorda Bay based on La Salle's 1685 occupation. But the Adams-Onis Transcontinental Treaty of 1819 setting the western boundary of the Louisiana Purchase gave Texas to Spain in return for ceding Florida. Merchants interested in the Indian trade in Texas and also sympathetic to the Mexican republicans financed volunteers willing to follow Long to Nacogdoches in June, 1819. The party captured the remote Spanish outpost and set up a Republic of Texas with Long as president. His agents visited Galveston Bay and invited Lafitte to join the movement, but he equivocated and immediately informed the Spanish governor. The poorly supplied Spaniards were unable to start to Nacogdoches until September when

they marched up the old *camino real* to East Texas. By the end of October, they had chased the Long party, including Long's wife, Jane, and American squatters across the Sabine (Gulick, 1927:1:30-31, 34, 36; 2:57, 60, 64, 66).

In February, 1820, James and Jane Long left her sister's home in Alexandria and went to Calcasieu [Lake Charles, Louisiana] where they took a boat to Bolivar Peninsula. A number of Long's followers had preceded him and had constructed a fort on the site of Humbert and Perry's old camp. They named it Las Casas for an 1811 San Antonio republican martyr of that name. They waited on the barren peninsula for supplies and reinforcements from New Orleans in order to launch an attack against the Spaniards down the coast. Lafitte was still on Galveston Island and invited the Longs to dinner; James declined but Jane boarded the boat and was taken to his vessel, an event that she described in detail seventeen years later. His village was already burned, according to Jane, and everyone was leaving. The dinner was "sumptuous" and the guests related many "thrilling adventures." The next day Lafitte sailed away (Gulick, 1927:2:75-76).

According to Jane, Long learned that 100 Karankawas were on the island on July 30, and were holding "war dances." He and 25 men crossed over and went down West Bay where, under cover of darkness, they closed in on the camp. They attacked at midnight and fought hand to hand—Long killed four Indians before breaking his sword. Altogether 40 Karankawas were killed and two boys captured. One lad drowned crossing to Bolivar and later the other was accidentally shot. Two of Long's men were killed and nine wounded by arrows (Gulick, 1927:2:86-88). One participant reminisced in the 1850s saying that Long attacked after the Indians had seized a stranded sloop on the beach and butchered the crew; John McHenry also remembered that there were 200 Indians (Brown, 1853:14:572-584).

This is the last reference to Karankawas on Galveston Island except for Jane Long's claim that they were visible from Bolivar in December 1821, a story that may not be true (Gulick, 1927:2:124). The battered nomads seem to have retreated to the mainland around the Colorado River where between 1822 and 1825 small bands plundered and sometimes killed isolated Anglos settling in the Austin colony. The Anglo Americans finally drove the remaining Karankawas westward until they sought refuge at the mission at La Bahia (Barker, 1969:91-94).

Soon after the Indian brawl, President Long convened his council and declared Las Casas a port of entry and established an admiralty court. The pseudo government also arranged for land bounties for soldiers, civil officers, and settlers and even announced a tariff of 15% ad valorem, naming a colleague collector (Gulick, 1927:2:88). Who was to pay duties on what goods is not revealed!

In October the Mexican exiles in New Orleans and their financial backers named a Hispanic to lead the movement but Long remained in charge of the Anglo American contingent. A lack of supplies and bickering among the various leaders delayed action

against the Spanish for almost a year. In September 1821, word reached the remote peninsula that the Mexican republicans had triumphed and occupied Mexico City (Gulick, 1927:2:94-103).

The Hispanic leaders and some Anglos sailed for Veracruz to go to Mexico City to seek their rewards for loyalty to the cause while Long and 52 followers took a ship to the La Bahia landing. If the Spanish garrison there had not joined the new Mexican Republic, Long would seize it. A tragedy of errors followed. Long captured the outpost, but was in turn arrested and taken to San Antonio because the Texas authorities had taken the oath of loyalty to the new government and he appeared to them as a filibuster. Long was sent to Mexico City where he was killed, supposedly by accident, in April, 1822 (Webb, 1952 2:76).

Expecting to return within a few weeks, Long had left Jane, his small daughter, and several families at Las Casas guarded by a dozen soldiers. But as time passed, all but Jane abandoned Las Casas when winter approached. She gave birth to another daughter at the end of the year and in the spring was rescued by Anglo American settlers who were arriving at Galveston Bay from Louisiana (Webb, 1952:2:76).

Anglo American Settlers in Mexican Texas: Galveston Bay 1822-1835

Galveston Bay became a focus for Anglo American settlement in 1822 and was used primarily as a means for water transportation to and from Texas and New Orleans, the source of supplies and a market for their produce. The latter included animal skins, pecans, bear grease, and wild honey that the settlers acquired in trade with the Coshattas on the Trinity River and also corn, butter, and cotton grown and processed by the newcomers. At first the vessels were small schooners and sloops but by the mid-1830s, steam packets began regular trips from New Orleans.

Galveston Island, the bay, and its major rivers were not included in Stephen F. Austin's colony, but in 1824 the impresario received special permission to add the families already located along Buffalo Bayou and the San Jacinto River and estuary (Barker, 1969:96-97). Thus those living west of Cedar Bayou and north of Clear Creek received titles, but settlers east of Cedar Bayou, on the Trinity River, or the eastern shore of Galveston Bay were under the jurisdiction of Nacogdoches. They were unable to acquire titles until 1834. Galveston Island and what is now Galveston County was forbidden to foreign-born persons as was Bolivar Peninsula and lower Chambers County. The national colonization law of 1824 prohibited settlement by foreigners within 26 miles of the coast except by special permission of the executive (Wallace and Vigness, 1963:48).

Austin's colony centered on the Brazos and extended west to the Colorado River valley, but entry to those rivers proved difficult for sailing vessels having over a four-foot draft.

The Brazos had a dangerous sand bar at its mouth while the approach to the Colorado River was through shallow Matagorda Bay. Moreover, a raft of logs blocked passage on the lower Colorado preventing navigation upstream. Galveston Bay and Buffalo Bayou proved to be the best entrance for incoming settlers and goods.

Stephen F. Austin had inherited the duty to fulfill his father's empresario contract that had been negotiated with the Spanish authorities in the waning days of the empire. Moses Austin, in order to recover from economic difficulties, became a Spanish citizen when he moved from a lead mine in southwestern Virginia to Spanish Missouri in the 1790s. The Louisiana Purchase in 1803 made him a citizen of the United States, but hard times following the War of 1812 ruined his mine and banking business near St. Louis. In 1820, a new Spanish policy welcomed foreign entrepreneurs to develop the remote Texas frontier. The old man applied for and received an empresario contract to bring 300 families, supposedly Roman Catholic former residents of Spanish Louisiana disgruntled at being annexed to the United States, to Texas to plant cotton. He died in June 1821 before he could move to Texas and on his deathbed asked that his eldest son use the contract to care for the family. Young Austin arrived in San Antonio only to learn that Mexico had won its independence and that he must go to Mexico City to confirm his father's grant with the new government (Barker, 1969:6-7, 21, 24-25, 28-29, 40).

Word about Mexican independence and the proposed Austin colony stimulated many Mississippi Valley residents to start to Texas in 1822. The effects of the banking Panic of 1819 had caused many honest men to lose their property when creditors demanded immediate payment. Rather than go to jail for debt, they went to Mexican Texas where they were safe from prosecution. Moreover, the Austins had already announced that the land in their grant would cost one-tenth of what vacant land sold for in the United States -12 1/2 cents instead of \$1.25 per acre. The cost of land was further reduced by the Mexican authorities in 1824; each head of a family could claim one league of land (4,428 acres) for fees amounting to about \$192.00, about 4 cents per acre (Barker, 1969:99-101).

The first vessels arriving between January and March, 1822 included three coasting schooners from New Orleans and two family sailboats (Gulick, 1927:2:124-125; 4:1:225-227). One of the schooners, the *Revenge* with perhaps 25 persons on board, appears to have grounded briefly on Red Fish Bar, an oyster reef with only four to five feet of water that stretched across the bay from present day San Leon to Smith Point (Looscan, 1914:196). This event served as a warning to other vessels with drafts over five feet. A family arriving in April in a sailing scow earned money ferrying newcomers from the Gulf to destinations on the San Jacinto (Wittliff, 1966:2-3).

Unlike the problems with the Karankawas on the lower Colorado River, the early residents of the San Jacinto estuary recorded only a single event. A small band identified in a reminiscence as renegade remnants of Karankawas and Tonkawas camped just below Morgan's Point in late 1822 or early 1823. According to the eyewitness who may have

exaggerated and embellished the incident for his descendants, the Indians lured one boatload of unsuspecting newcomers ashore with a white flag and killed all but one man who escaped. The neighbors rallied and crept up on the Indian camp where they saw them eating human flesh. The Anglos killed most of the Indians, and those who escaped never returned. The same individual, however, traded with the peaceful Coushattas who lived above Liberty on the Trinity River (Wittliff, 1966:4-5).

The first of many vessels wrecked on Red Fish Bar was the schooner *Mary* from New Orleans in March 1825 with 36 passengers and their goods. The ship drew 7 feet and even though the captain sent a boat out to sound for a channel, the signal was too late and he went hard aground. The vessel beat on the bottom and the captain ordered barrels of flour and tobacco jettisoned. Nevertheless, the ship was a total loss and the passengers demanded that the captain pay for their property. This disaster inspired Austin to sound and map the bay, and he spent over two weeks in 1826 with a crew of nine in three boats marking safe channels (Barker, 1924:1:1074, 1115-1116, 1285-90). The wreck was still visible to those entering the bay in January, 1828 (Clopper, 1909:51).

Austin's effort was rudimentary, but in 1828 a Mexican naval officer surveyed and sounded the bay for his government. Alexander Thompson, formerly of the United States navy where promotions were slow, spent three months from September through November carefully recording the depths of the passes at the Gulf and at Red Fish Bar plus scattered depths throughout the shallows, the Galveston channel, the San Jacinto estuary, and Buffalo Bayou as far as Harrisburg. He plotted householders whose residences could serve as landmarks, labeled Goose Creek and Double Bayou, but did not sound the seven mouths of the Trinity River delta. Altogether, it was the most accurate and useful map of the bay to that date (Thompson, 1828).

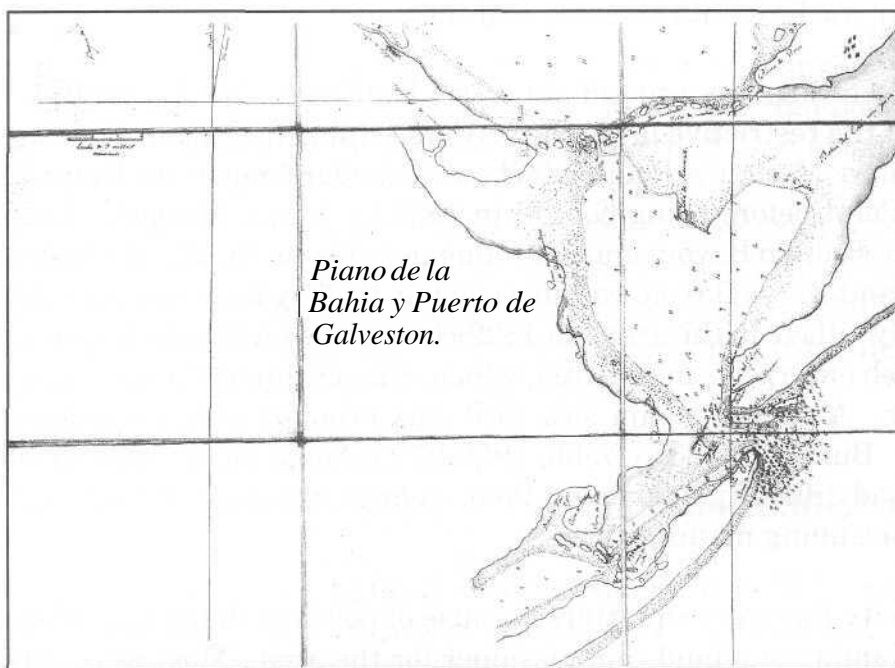


Illustration 7.-Piano de la Bahia y Puerto de Galveston (1828). (Source: Barker Texas History Center)

The first steamboat arrived in Galveston Bay in December, 1830. Henry Austin, a cousin of the empresario, had taken the 86-ton *Ariel* from New York to the Rio Grande the previous year. Finding insufficient business there to pay for the upkeep of the vessel, he steamed to the Brazos River. The ship drew five feet, and when leaving the river for New Orleans in November, the bottom and machinery were damaged on the Brazos bar. Henry managed to get the vessel up Galveston Bay to Buffalo Bayou but found that it could not be repaired and the *Ariel* was still beached and rotting two years later (Hogan, 1934:185-214; Anonymous, 1975:194).

The settlers around the San Jacinto estuary in the 1820s were primarily agrarians. Most were subsistence farmers, some of whom traded with the Coushattas for pecans, wild game, bear grease, and hides, commodities that could be sold in New Orleans. Others were planters who arrived with slaves and capital to grow and process cotton and raise livestock, also sold in Louisiana. A few owned their own boats and became merchants taking agricultural products to New Orleans or the Mexican ports and returning with staple goods (Henson, 1986:6-10).

Geographer Robin W. Doughty noted that the newcomers, both American and European, viewed the Texas environment as *useful* habitat: woodlands were good for building material, prairies for pastures, and game animals for meat and recreational marksmanship. Moreover, wanting their new homeland to resemble where they had come from, they cleared the forest, planted fields, and built homes to subjugate the wilderness. In their efforts to civilize Texas, they imported plants and animals from their previous places of residence. Thus cotton and corn replaced native grass, imported fruit trees displaced native trees, and domestic animals drove out wild creatures (Doughty, 1986:426-433). What these changes meant for Galveston Bay was the beginning of erosion and silting of the waterways from denuded forest and prairie lands that turned to dust and mud before blowing or washing into streams and the bay.

People gathered in small settlements around the bay. Unable to develop Galveston Island as a port because of the restrictive laws, the settlers established several landings on the San Jacinto estuary: Morgan's Point which was earlier known as Rightor's, Hunter's, and Clopper's Point before being bought in 1833 by James Morgan; Lynch's ferry opposite the mouth of Buffalo Bayou; and a landing near Goose Creek. Harrisburg at the junction of Buffalo and Brays Bayou was surveyed in 1826 by its proprietor, John R. Harris, and was the only village in the area. In 1829 Harris was building a steam saw and grist mill, the first such enterprise in the area, which was continued by his partners after his death that year. A second steam saw mill was brought to the Lynchburg neighborhood by David G. Burnet in 1831 (Webb, 1952:1:775; Anonymous, 1975:87-90). Both of these industries had difficulty in keeping their engines in repair so they cannot be considered full-time continuing manufactories.

The residents around Trinity Bay were squatters because of political changes in Mexico City that prevented the naming of a land commissioner for the area. Most were cattle

raisers from southwestern Louisiana and brought their families and animals by land. A few former Lafitte men found the area congenial and were boatmen (Henson and Ladd, 1988:22-26).

In 1830 New York speculators acquired some about-to-expire six-year empresario contracts and sent a number of settlers including some German immigrants to the lower Trinity the following year. Their arrival coincided with a change in policy in Mexico City that sent a garrison to Galveston Bay and other entrances to Texas to enforce the laws against smuggling and to support the newly appointed customs collectors. The Texans had enjoyed a temporary exemption from national tariff duties which expired in 1830, but because of poor communication about the impending change and American agrarians' innate dislike of tariffs, the new order caused trouble. At first the customhouse was at Anahuac to be near the garrison but in early 1832, the government ordered a customhouse, a warehouse, and a barracks for a squad of soldiers near the eastern end of Galveston Island (Henson, 1982:88-89).

Col. Juan Davis Bradburn, one of the Henry Perry-Xavier Mina volunteers who remained in Mexico after 1817, was the commander at Anahuac, the town he created on orders of his superior. He refused to allow the New York company's settlers to receive land because it seemed contrary to a new national law, and he arrested a number of Anglo Texans including William Barret Travis for breaking Mexican law within the fort. While the military could arrest civilians for trespassing on government property, tempers flared and Brazos River volunteers marched against Anahuac in June, 1832. Fortunately for the Texans, a civil war that had been raging since 1830 put republican reformers in control of the national government; the Texans claimed that they opposed Bradburn as the symbol of the just-defeated centralist administration. The reformers closed the customs office and the garrisons left Texas (Henson, 1982:28-118).

The population of Texas and Galveston Bay increased during the 1830s in spite of the political unrest. The bay was a major artery for goods and passengers going to both the San Jacinto and Trinity rivers. In 1834 a second steamboat, the *Cayuga* bought by William P. Harris and Robert Wilson, the former operators of the steam mill, appeared in Galveston Bay. The 96-foot-long sidewheeler drew about five feet and could cross Red Fish Bar with caution. She remained in service for the next two years and marked the beginning of the steamboat era (Epperson- McGinty, 1975:14-17). In 1836 she was joined by the steamboats *Laura* and *Yellowstone* that served during the war against Santa Anna by carrying troops and supplies up the bay.

The Republic of Texas 1836-1845

Trouble began between the Texans and President Antonio Lopez de Santa Anna when he ordered Anahuac re-garrisoned in 1835 and the customs collector reinstated. Once a republican reformer, he reversed his course and became more dictatorial by centralizing

power in Mexico City at the expense of the states. In June Travis led a flotilla from Harrisburg to Anahuac to seize the small garrison after a minor incident resulted in the arrest of a merchant. The Texans called meetings to decide their course and the revolution erupted at Gonzales. Government troops from San Antonio demanded the return of an old cannon loaned to citizens for defense against Indian attack and the Texans refused to give it up.

On March 2, 1836 delegates signed a Texas Declaration of Independence and created a government for a new Republic of Texas. The new officials fled from the Brazos to Harrisburg in March for the convenient transportation system on Galveston Bay. Moreover, President David G. Burnet's home was just east of Lynchburg while that of Vice-president Lorenzo de Zavala, a republican patriot from Yucatan, was across Buffalo Bayou from what became the San Jacinto battleground. In mid-April the new government learned that Santa Anna was crossing the Brazos River at Fort Bend so the officials boarded the steamers for Galveston Island where schooners were anchored in case an escape was necessary.

The astonishing victory on April 21 at the junction of Buffalo Bayou and the San Jacinto River resulted in the capture of President Santa Anna. It was April 26 before the victory message carried by rowboat reached Galveston Island, and it was May 1 before the *Yellowstone* took the president and other dignitaries to the battleground to confirm Gen. Sam Houston's tentative armistice with Santa Anna. The Texas army was sent southwest to follow the remnants of the Mexican army as it retreated from the Brazos River to Victoria and finally the Rio Grande. Santa Anna and the forty captured officers were taken to Galveston on the steamboat. Santa Anna and his three aides were removed to the Brazos in mid-May while the other officers were kept in tents on the island until August when they moved by steamer to Liberty. Some common Mexican soldiers were dispersed to individuals who needed laborers to rebuild their homes and plant crops, while others labored on Fort Travis being built on the eastern tip of Galveston Island, cut wood for the steamboats, or other heavy labor. President Sam Houston released Santa Anna and his aides in November and the rest of the prisoners in April, 1837 (Henson, 1990:189-221).

Communities around the bay changed after the Battle of San Jacinto. Anahuac and Lynchburg remained small transfer depots for goods and passengers heading inland. New Washington on Morgan's Point, a speculative town created by New York investors and their Texas agent, James Morgan, in 1834 never recovered after the Mexican cavalry occupied, ransacked, and burned the store, warehouse, and residences on April 16-20. Santa Anna allowed his troops to do the same at Harrisburg on April 15.

Two new towns, Houston and Galveston, both private ventures, emerged as the leading cities in Texas soon after their founding in 1836 and 1837 because of their convenient locations. Houston developers, A. C. and John K. Allen, New York natives but residents of Nacogdoches since 1832, hired the steamboat *Laura* to make its way up the twisting

and overhung bayou in January, 1837, a first step in proving the city could be a port. Meanwhile, Michael B. Menard and his partners, Thomas F. McKinney and Samuel May Williams, worked to have their 1833 title (acquired from a native-born resident of San Antonio) to the eastern end of the island approved by the new Texas Congress. Many other speculators coveted the strategic site, but finally by inviting their rivals to join their venture and paying the new Republic \$50,000.00, the Galveston City Company was formed (Henson, 1976:94-97).

John James Audubon, who had published the first volume of *The Birds of America* in 1827, visited Galveston Bay and Houston for three weeks in April and May, 1837, hunting specimens to paint for another volume in the series. His vessel anchored in the Galveston channel just off Fort Travis on April 24 where he saw Blue-Winged Teal, Snowy, Purple, and Blue Heron, various species of Sandpipers, and Black-Necked Stilts. A storm struck that evening before he could go ashore, and in the morning he noted "thousands of birds, arrested by the storm in their migration northward, are...hovering around our vessels, and hiding in the grass, and some struggling in the water, completely exhausted (Audubon, 1869:408; Geiser, 1930:16:120)." Excerpts from his notes and journal provide details about the wildlife in 1837:

"April 26. Went ashore...[found]...Blue-Winged Teal...on all the ponds and salt bayous or inlets...where they breed in great numbers; the Black-Necked Stilt, which occurs in small flocks on the brackish ponds...[are]...so shy that it was difficult for us to procure specimens...Black-Headed or Laughing Gulls, now paired, and very nosy, were...seen hovering over the inner ponds of the island, as if in search of food (Geiser, 1930:16:121).

"April 27. We were off at an early hour for the island, two miles distant; we waded nearly all the distance, so very shallow and filled with sandbanks is this famous Bay. The men large fires to keep off the mosquitoes, which were annoying enough for even me. Besides many interesting birds, we found a new species of rattlesnake, with a double row of fangs on each side of its jaws (Audubon, 1869:408-409).

"April 28. We went on a deer hunt on Galveston Island, where these animals are abundant; we saw about twenty-five, and killed four...was delighted to observe the behavior of four Turnstones [migratory, plover-like, but allied to sandpiper], busily engaged in ingeniously searching for food along the seashore (Geiser, 1930:16:121-122).

"April 29. Hundreds of Least Tern are breeding on the island of Galveston Bay. Also, on one of these islands I found eight or ten nests of the Roseate Spoonbill, placed in low cactuses, amid some hundreds of nests belonging to Herons of different species. Snakes are abundant on the island, and live on the eggs of nesting birds, whence the old name for Galveston Island of "Snake Island." The Common Tern is strangely rare just now: only a few are arriving from the west. The Gadwall

Duck is quite abundant on all the inland ponds and streams, as well as on the brackish pools and inlets of the islands and shores of Galveston Bay. Many of them have paired and separated from the other ducks...[other species breeding on Galveston Island included]...the Dusky Duck, the Mallard, the Blue-Winged Teal, the Widgeon, and the Shoveller Duck... [and the young] ...plentiful in the end of June and beginning of July (Geiser, 1930:16:122).

"May 1. The muskrat is the only small quadruped found here, and the common house rat has not reached this part of the world (Geiser, 1930:16:123).

"May 2. ...landed on a point where the Texan garrison is quartered...saw a badly stuffed skin of a grey or black wolf, of the same species I have seen on the Missouri...found a few beautiful flowers, and among them one...I...nicknamed the Texan daisy: and we gathered a number of their seeds...We walked down to the shore bordering a shallow bayou, for the purpose of fishing for prawns (which here grow to a very large size and are extremely abundant) and of catching fish...we saw three spoonbills alight on a sandbar, and...succeeded in getting near enough to kill the finest of the three. Almost at the same instant the back fins of a large fish resembling those of a shark appeared...rammed home a couple of bullets, and lodged them in the body...it floundered about...used its best efforts to get into deeper water...the gun was again charged with balls...the boatswain at a single luck stroke cut off its tail, and having fastened the hook in one of its eyes, we dragged it to the beach...but instead of our prize turning out a shark, it proved to be a sawfish, measuring rather more than twelve feet...from her body we recovered ten small sawfish, all of them alive and wriggling about as soon as they were thrown on the sand. The young were about thirty inches in length, and minute sharp teeth were already formed (Geiser, 1930:16:123-124).

"May 5. Hunted birds over the interior of Galveston Island today. While I was watching some Marsh Hawks that were breeding...! was much surprised to find a large flock of Skimmers alighted, and apparently asleep, on a dry grassy part of the interior...[they]...usually rest much nearer to the shore...[but] ...the tide was much higher than usual [because] of the recent severe gale, and had covered all the sand banks...[where they usually rested.] I found broods of the Spotted Sandpiper, or Tattler, already well grown (Geiser, 1930:16:124-125).

Audubon and his friends sailed up the bay towards Houston, and after entering Buffalo Bayou, "saw an abundance of game." The bayou was "usually sluggish, deep, and bordered on both sides with a strip of woods" about one mile deep. The banks had a gentle slope and the soil appeared good; the prairies in the rear "are cold and generally wet, bored by innumerable cray-fish, destitute of clover, but covered with coarse grass and weeds, with...[an occasional]...grove of timber, rising from a bed of cold, wet clay (Audubon, 1869:411)." Twenty miles up Buffalo Bayou

Audubon found "the Ivory-Billed Woodpecker in abundance, and secured several specimens (Geiser, 1930:16:125)."

On the return voyage to Galveston Island on May 16, Audubon "noticed with great surprise how well adapted the Texas prairies were to the habits of the Black-Throated Bunting...being extremely numerous in every open piece of ground covered by tufts of tall grass." He also noted "that the American Widgeons were all paired...." (Geiser, 1930:16:129).

Five months after Audubon left Texas, a hurricane struck Galveston on October 1, 1837, the first of many storms to devastate the city with high water and wind. Ships anchored in the channel were blown ashore and one destroyed the just-finished three-story McKinney and Williams commission house at the foot of 24th Street and also a new customhouse on the opposite corner. The only structure left undamaged was the 1832 Mexican customhouse which had been converted into a residence where over ninety people sought shelter. Most of the stranded vessels were refloated, but two remained on shore and were used as a temporary customhouse and the other a hotel and later a jail (Hayes, 1974:276-279). A map drawn for the Galveston City Company in 1838 revealed that the storm reopened the cut between the eastern tip of the island and the main portion similar to the 1816 manuscript map. This cut was not visible in the 1828 map made by Alexander Thompson.

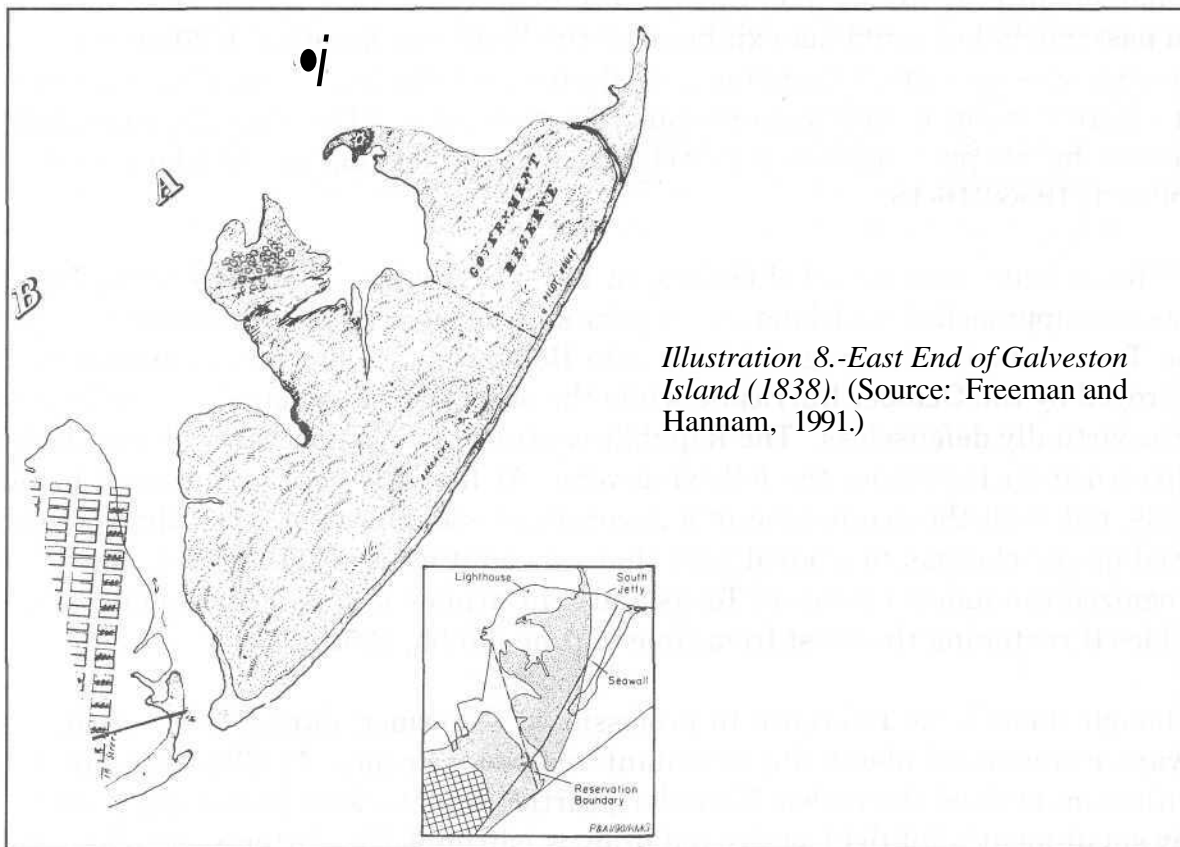


Illustration 8.-East End of Galveston Island (1838). (Source: Freeman and Hannam, 1991.)

Another storm in September, 1842, inundated the town and altered the configuration of Fort Point on the eastern tip, a pattern that continued until the end of the century, A gun platform had floated closer to the shore and the coast guards struggled to reposition the three 18-pounders on higher ground. William Bollaert, a British visitor, believed the shore needed levees. The wind, he said, had blown down the protective sand hills along the gulf and "thus the sea broke through, covering the end of the Island" (Bollaert, 1956:142-44, 151-52).

Galveston and Houston became both destinations and transfer points for people and goods heading inland. Beginning in 1838, small river steamboats made regularly scheduled trips between the island and Houston, usually in about ten hours, while a few larger steamboats plied the Gulf between the island and New Orleans. Comfortable salons, one for the ladies and another for the gentlemen made travel by steamer pleasant. Sailing vessels also continued to bring freight and passengers to the island city where the shallow-draft steamers would load for Houston or the Trinity River. There were no roads leading inland from the shore.

Shallow water caused problems for even the almost flat-bottomed river steamers. In 1838 the *Sam Houston* went aground at Red Fish and spent a day getting off; at dusk it continued towards Morgan's Point where it grounded and the crew worked two days to refloat the vessel (Muir, 1950:238). The main channel of the Trinity River was often just as shallow. In 1844 the steamer *Ellen Franklin* descended the Trinity loaded with cotton and passengers but could not exit because the *Vesta* was aground in 30 inches of water. The crew was unloading its cotton onto flatboats so the boat could slide over the sand bar where the cotton had to be reloaded for Galveston. The *Franklin* prepared to do likewise, but its passengers sensibly changed vessels leaving for the island on the *Vesta* (Bollaert, 1956:316-18).

The Texas Navy also occupied Galveston Bay. In August, 1837, two of the Republic's schooners approached the island with a prize ship followed by Mexican cruisers in pursuit. One Texas schooner managed to slip into Bolivar Roads but went aground and was destroyed by the October hurricane while the other foundered on the outer bar leaving Texas virtually defenseless. The Republic contracted for a number of ships which were delivered from Baltimore the following year. At first the vessels anchored in Bolivar Roads, but with the acquisition of a government steamboat in 1838, the vessels were towed up the channel to a naval yard that was built west of 25th Street. Mexico never recognized the independence of Texas and sent armies into San Antonio twice in 1842 besides threatening the coast from time to time (Webb, 1952:2:750).

Although there is no reference to professional fishermen during this period, visitors always commented about the abundant seafood. Francis C. Sheridan, an English gentleman, praised the turbot [flounder], turtle, mullet, skate [stingray], rcdfish, soles [any small-mouth flat fish], crabs and prawns [shrimp]. The latter were 6-7 inches long and he and a friend gathered 70 pails of shrimp in a seine. He noted that the local

people dreaded the alligator gars, some over 5 feet long, more than alligators (Sheridan, 1954:32, 122-23). A few years later, Dr. Ferdinand von Roemer, a German naturalist, gathered oysters from the decaying hull of a beached naval vessel. The large Galveston oysters were not as good, he said, as the small European variety, but the local shops served them any time of the day-raw, fried, roasted, or stewed (Roemer, 1935:50-51).

Dr. Roemer also visited Morgan's Point where he saw several hundred cattle grazing on the prairie, Morgan's house was on a twenty-foot bluff and his slaves produced corn for the Galveston market. Morgan, like his neighbor across the San Jacinto, Dr. Ashbel Smith, experimented with sugar cane. The German was amazed at the mounds of clam shells "a fathom deep" around the shore and wrongly concluded they had been deposited when the sea level was different (Roemer, 1935:53-62). Dr. Smith, surgeon, planter, and later founder of the Galveston medical school, was always ready for profit, and he had his slaves shovel the shell middens onto vessels for use on Galveston streets (Henson, 1986:44-46).

Many ordinary residents also used the bay to supplement their incomes. Galveston Island was without trees or fresh water and mainlanders sailed their small craft to the island to supply barrels of water and loads of firewood. The steamboats also required fuel and enterprising men could stack cord wood near landings in exchange for money or transportation. Farmers and cattle raisers also found a ready market at the island for fruit, vegetables, meat, dairy, and poultry products. Many saved transportation costs by sailing their own boats to Galveston to exchange their produce for store goods.

After nine years as an independent but financially insecure republic, Texas finally was annexed to the United States. Most residents viewed the union as a means for a more stable economy and better defense from the Mexicans and the Indians. Shipping interests hoped that the United States would improve navigation in Galveston Bay dredging, marking, and charting.

Improving Navigation: Statehood to World War 1,1846-1914

Annexation to the United States in December, 1845, brought on a war with Mexico for the next two years. The war stimulated business and commerce and brought new people to the bay area, some of whom stayed because of the economic promise. For example, two northern entrepreneurs erected a 42-inch Tyler steam cotton press in 1846 at Galveston at the foot of 25th Street capable of processing 500 bales per day, far surpassing older presses. The partners also contracted with a Trinity River boat builder for a 110-foot-long steamboat drawing 4 1/2 feet to carry 1,000 bales of cotton (Hayes, 1974:713, 920-21; Block, 1988:25).

The 1850 United States census for Galveston County revealed the importance of maritime activity because Galveston was the largest town in Texas with 4,177 people (*Texas Almanac*, 1964-1965:123-125). Twenty-four men were listed as mariners including a number of well-known ship captains and about the same number of seamen. The difference in nomenclature is clear in the population schedule: mariners were usually householders with families—captains of vessels who resided in the port. Seamen, on the other hand, were the more transitory deck hands, single men living in boarding houses and hotels near the wharves. The five men listed as boatmen can be presumed to be the skippers of small sloops that ferried people to the mainland and around the port. The harbor employed three pilots, even then a status position requiring long experience to understand the shifting sand bars and the various deep-water channels at the entrance to Galveston Bay. The increasing maritime activity prompted the United States to provide a lightship at the entrance to the bay which was manned by four foreign-born hands under the direction of a long-time local mariner. There were three ship carpenters and many plain carpenters while cabinet makers and painters living near the wharves probably were associated with boat building. There were also: one ship-rigger, five sailmakers, three coopers, and one ropemaker. Commercial fishing was a recognized activity with five "fishermen," all foreign-born as was the single "oysterman" (United States Bureau of the Census, 1850: Galveston).

The Harris County census reveals a number of small boatyards around the San Jacinto estuary by the presence of four shipwrights. Several men were "sailors" along with one "master of a schooner." Most of the residents around Trinity Bay and the mouth of the river in what was still Liberty County (Chambers County was created in 1858) claimed to be farmers and ranchers but there were a few "boatmen" and several carpenters who probably built boats (United States Bureau of the Census, 1850: Harris and Liberty counties).

These census statistics show that in the 1850s the bay functioned primarily as a transportation system but that a small number of persons were commercial fishermen. Given the rural nature of the bay shore at this time, one can assume that fishing like hunting was also a normal activity of many individuals living in the vicinity. In general seafood would have to be consumed immediately because salting and drying were the only means of preservation at that time. The maritime activity, in turn, provided many

area residents with the means of their livelihood beyond seamen and boat builders; supplying the vessels with wood, water, and food at the various stops was a way farmers could earn money.

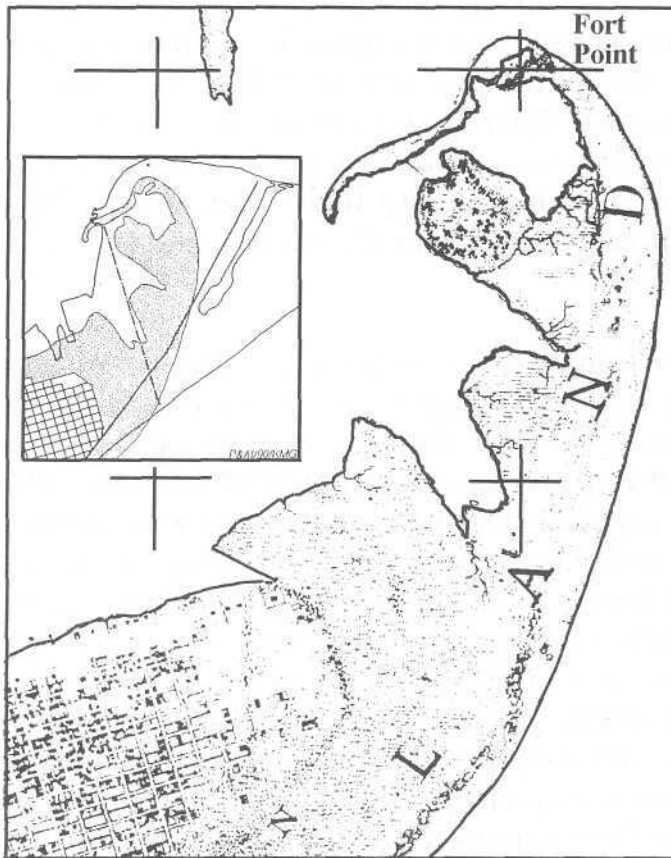


Illustration 9a.-East End of Galveston Island (1850). (Source: Freeman and Hannam, 1991.)

Steamboat travel was quick and easy but not safe. The high pressure engines used at this time had no safety devices and serious accidents occurred when boilers exploded. The first such disaster took place in December, 1841, when the *Albert Gallatin* exploded enroute to Galveston about six miles from its destination. Five persons were killed and nine wounded. The survivors were picked up by another steamer (Hayes, 1974:124). Another cause of accidents was rivalries between captains who would race their boats between Houston and Galveston just as their counterparts did on the Mississippi River and elsewhere. In January, 1853, the *Neptune* and the *Farmer* raced towards

Galveston sometimes touching sides. While neither vessel was injured on that trip, two months later the *Farmer's* boiler blew up near Pelican Island killing perhaps thirty-six people including the captain and twelve crew members (Sibley, 1968:71.)

Improved Navigation in the 1850s

The hoped-for navigational aids were slow in coming after annexation due in part to the war with Mexico. By 1850, however, the U. S. Army Corps of Engineers began the surveys that resulted in the periodic publishing of updated charts detailing Galveston Bay. These charts showed the depth of the bay and its channels, buoys and lights, and hazards such as shipwrecks and shoals. They also marked wharves and piers plus giving a grid of towns and roads along the shore. The directions for entering Galveston Harbor

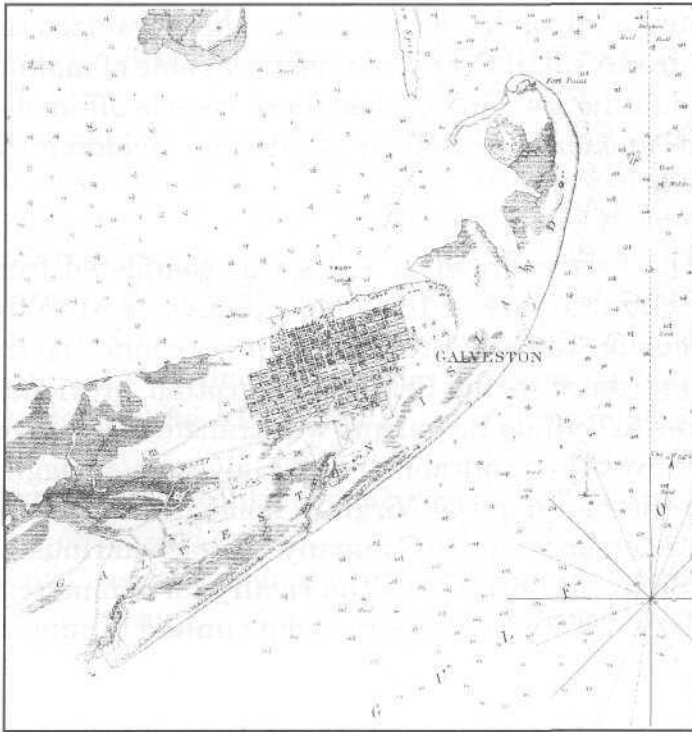


Illustration 9b.-Galveston Entrance (1856).
 (Source: U.S. Government.)

included sighting landmarks in the town such as the church spire and the market house belfry which were shown on the grid.

Responding to the demands of mariners and shippers, the *Galveston Lightship*, a newly built east coast schooner, arrived in October, 1849, and anchored about a mile off the outer bar. Its single white light at the top of the mast served as a beacon but soon it was moored inside the bar due to the rough seas. In 1859, lighted range beacons were placed on Bird Key, Pelican Spit, and in shallow water off Bolivar to aid vessels searching for the channel. The government erected a cast-iron light house sixty-five feet tall on Bolivar Point in 1852, but complaints that it was inadequate led

to improvements in 1858. Workers raised the tower to eighty-nine feet and installed a Fresnel lens and better lamps (Baker, 1991:52-53, 58-59).

While these improvements were financed by the United States government, the Texas legislature also was involved in improving the San Jacinto estuary. A rivers and harbors bill in 1853 and subsequent acts provided seed money but required local interests to contribute one-fourth of the costs. For example, Houston merchants subscribed sufficient funds to begin dredging through Cloppers and Red Fish bars in 1857 (Alperin, 1977:18-53). Houston commercial interests and the city also paid for deepening and straightening Buffalo Bayou above Harrisburg at this time (Sibley, 1968:69). Meanwhile, the federal government placed screwpile lights at Cloppers, Red Fish, and Fort Point on Galveston Island. These were wrought iron piles with oversized screws on the lower end which were twisted into sand and shell in shallow bays; a modest frame lighthouse with lanterns was erected on top (Baker, 1991:5).

Antebellum Rivalry between Houston and Galveston

The islanders and the residents of the Bayou City developed a bitter rivalry in order to dominate commerce. Most ships could enter Galveston's harbor through the natural channel, but only the shallow-draft river steamers could go up the bay to Houston. The Galveston Wharf Company, a combination of the owners of the various wharves, took advantage of their monopoly to set wharfage rates considered exorbitant by marine

interests. During the 1850s, Houston merchants and steamboat captains organized the Houston Navigation Company and acquired a small fleet of steamers capable of making the trip from Houston to the island in eight hours. Sometimes these vessels off-loaded goods and passengers to and from ships anchored in Bolivar Roads thus avoiding the Galveston wharf rates (Sibley, 1968:65-71).

A second rivalry involved railroads. The first railroad in Texas was completed from Harrisburg to the Brazos River in Fort Bend County in 1852 and extended west to the Colorado River by 1860. In 1856, the Houston Tap and Brazoria Railroad connected the lower Brazos with the Bayou City and Harrisburg so that Brazos valley cotton, previously consigned to Galveston, now rode the rails to Buffalo Bayou and was transferred to river steamers. This eliminated the islanders from the profitable trade. Galveston struggled to build a causeway from the island to the mainland at Virginia Point for its railway venture, the Galveston, Houston and Henderson Railway Company. It reached Houston in 1859 just in time for the Civil War (Sibley, 1968:72-74). The rivalry for commercial supremacy halted briefly between 1861 and 1865 when area residents united to support the Confederacy.

The Civil War and Galveston Bay

On March 2 (Texas Independence Day), 1861, even before the South Carolinians fired on Fort Sumter, Galveston volunteers seized the U. S. revenue cutter in the harbor, the customhouse, and the lighthouse supply ship that had just arrived with oil and other supplies for the harbor lights. They also occupied U. S. Army fortifications recently begun on Pelican Spit consisting of a two-story boarding house, a wharf, and "large quantities of reef-shell" accumulated for construction, a reference no doubt to the destruction of ancient middens. The Confederates removed the lights from the lighthouse (and dismantled the tower for scrap), the lightship, and all the markers from the channels to prevent easy access by the enemy (Hayes, 1974:487, 492; Baker, 1991:59).

The Confederates also seized vessels in the harbor, and in the case of two Yankee merchantmen, filled them with rubble and sank them on the inner bar to obstruct access to Galveston's channel. Confederate gun emplacements (some were "quaker" guns—logs painted black) stretched along the Gulf to Fort Point and were spotted in other strategic sites around the entrance to the harbor (Hayes, 1974:497- 501). Union vessels began blockading Galveston in July, 1861 and continued through May, 1865. On October 4, 1862, the blockading fleet entered Galveston Bay and disabled Fort Point's batteries. The federals demanded the surrender of the city within four days, a time used by the Confederates to remove artillery, military stores, families, and cattle to Virginia Point via the railroad bridge. The federals landed 150 marines at Kuhn's wharf and raised the U. S. flag for one-half hour before retreating to the eight or nine ships anchored in the Galveston channel from 25th Street to Fort Point. Except for one bombardment provoked

by a Confederate spy, Union troops remained quietly confined to their vessels for the next three months except for an occasional patrol (Hayes, 1974:518-26, 541-43).

Less than three months later, the Confederates mounted a successful New Year's Eve attack to recapture Galveston. Troops crossed the railroad bridge from Virginia Point while a small flotilla of merchant steamers and schooners descended the bay from Harrisburg. The machinery and sharpshooters were protected by bales of cotton, thereby earning the name of "cotton-clads." Shortly after dawn the surprise attack ended in victory. One large Union vessel was disabled and captured (and converted into a blockade runner) while another was destroyed by its commander to prevent surrender; the rest of the federal fleet fled the harbor (Hayes, 1974:551-66; Ziegler, 1938:303-04).

The blockade continued offshore but the Confederates occupied the island through the end of the war in 1865. Blockade runners darted in and out of Galveston Bay and San Luis Pass at the west end of the island taking cotton to market at Matamoros and Havana and returning with needed supplies (Hayes, 1974:513).

Navigational Improvements Dredging to Aid Commerce, 1866-1914

Commercial demands for deep-water shipping dominated the use of the bay in the late Victorian period. This was the so-called Gilded Age, the peak of the unhampered exploitation of natural resources when businessmen used their political influence to further their own interests in railroads, mining, timber, and heavy industry. Bay area entrepreneurs pressured Congress to deepen the channels and the entrance to Galveston Bay to accommodate the larger ocean vessels in order to increase commerce.

The commercial rivalry between the two port cities resumed after the war. Houstonians organized the Houston Direct Navigation Company, a consortium of merchants, boat owners, and captains, to run steamers and barges between Houston and Bolivar Roads by-passing Galveston. A parallel company with many of the same directors, the Buffalo Bayou Ship Channel Company, was formed to improve the bayou. The Houston interests acted quickly, hoping to take advantage of Galveston's temporarily clogged channel that had only 9 1/2 feet of water due to the wartime barriers. The main entrance channel from the Gulf was 12 feet deep, so if the Houstonians could dredge a 12-foot-deep channel to their town, even the largest ships could reach the Bayou City. The state granted permission for the private undertaking subject to approval by the state engineer (Sibley, 1968:87-88).

Politics and a lack of money delayed the project until the 1870s when dredging began at Morgan's Point and Red Fish Reef. The U. S. Congress finally appropriated funds for the Corps of Engineers to dredge a 6-foot-deep channel through Red Fish Reef in 1872 and two years later increased funding for a projected depth of 9 feet (Alperin, 1977:96-97;

Sibley, 1968:100). Shipping tycoon Charles Morgan of New York and New Orleans became interested in the project when the railroad in which he was an investor planned a new line to Houston. He was already annoyed by the charges levied by the Galveston Wharf Company and so joined the dredging effort in 1874 in order to circumvent the need for his ships to call at Galveston. Morgan agreed to dredge a 9-foot-deep channel 120 feet wide from upper Galveston Bay through Morgan's Point and up Buffalo Bayou to a railroad

terminal opposite Harrisburg. He placed a large chain across the channel at Morgan's Point and charged tolls for vessels desiring passage. The chain remained in place until the mid-1880s when the United States government acquired the rights from the Morgan heirs (Sibley, 1968:93-99).

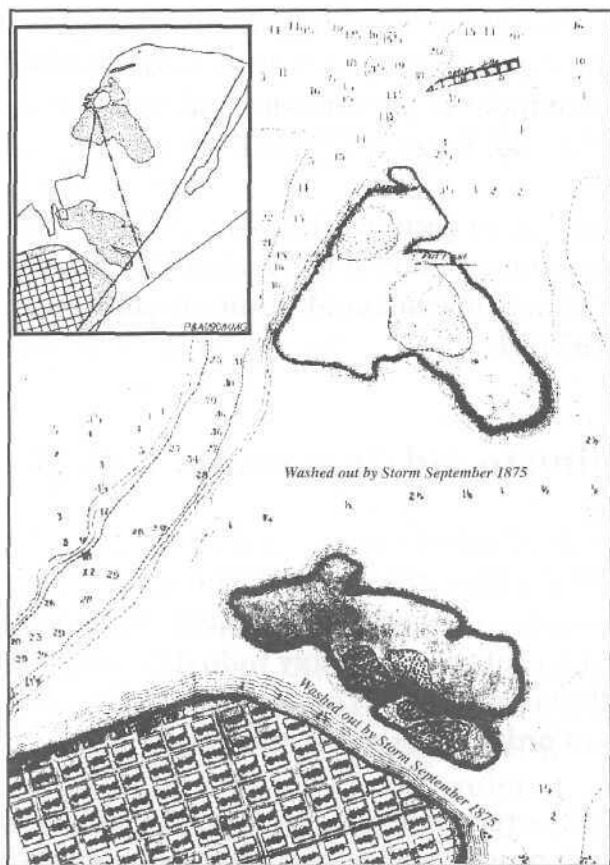


Illustration 10a.-East End of Galveston Island (1875). (Source: Freeman and Hannam, 1991.)

A hurricane on September 15-16, 1875, severely affected Galveston Bay. Storm tides reopened the old channel that cut through the marshes from the bay to the gulf on the eastern end of Galveston Island, cutting off old Fort Point (*Houston Weekly Telegraph*, 10-1-1875; Freeman and Hannam, 1991:26). On the San Jacinto River, tides reached fourteen to twenty feet above normal and destroyed the town of Lynchburg, an important transfer point for vessels unable to ascend Buffalo Bayou. Houston merchants feared that the almost-completed cut through Morgan's Point was ruined, but the channel actually benefited from the scouring waters (*Houston Weekly Telegraph*, 9-17, 24, 1875).

The Struggle for a Deep Water Port

The ever-increasing size of vessels coming to Galveston Bay required deeper water. In 1877 Congress authorized a 100-foot-wide and 12-foot-deep channel dredged from Bolivar to Red Fish Bar, a project that was eventually extended northward. The project, of course, was accomplished in slow stages. The Houstonians gleefully expected to compete on equal footing with Galveston's natural 12-foot-deep channel (Alperin, 1977:98). The deeper water signaled the end of the romantic riverboat days on Buffalo Bayou and by 1890 many were converted to steam barges. Businessmen in both Houston and Galveston wanted the larger capacity ocean-going vessels to call at their ports exporting

cotton, lumber, and grain, and to deliver coal and general merchandise (Sibley, 1968:103-04, 110-111).

Changing technology also improved dredging capabilities and the Corps of Engineers next project altered Galveston Bay forever. The Corps decided in 1880 that they would need jetties into the Gulf to maintain the long-range goal of a 25-foot-deep channel through the inner and outer bars desired by shippers. Their model was an 8-foot-bar at the mouth of the Mississippi River that had been scoured to a depth of 30 feet within five years by building 2-mile-long jetties (Alperin, 1977:40, 47).

The challenge was what kind of jetties could withstand the wave action in the Gulf. Without convenient stone quarries near the Texas coast, the Corps had experimented between 1874 and 1879 with gabions to scour the inner bar between Fort Point and Pelican Spit and to gradually deepen the entrance from the Gulf to 18 feet. They sank two rows of 6'x6' cylindrical wicker cages coated with cement and filled with sand northeastward from the end of the city breakwater to the edge of the Bolivar Channel and then southward toward the Gulf. A parallel row of gabions extended into the Gulf



Illustration Wb.-Gabions. (Source: Alperin, 1977.)

from Bolivar Peninsula. By 1879 the gabions had deepened the water over the inner bar from 12 to 20 feet but the pass to the Gulf was not noticeably improved. The Corps gave up on gabions and decided that a combination of wooden "mattresses" and stone was required (Alperin, 1977:27-33).

Appropriations and technical problems plagued the work between 1880-1883 and it was 1887 before work resumed using clay and stone. Completed a decade later in 1897, the south jetty was six and one-half miles long, and the north jetty almost five. The water over the outer bar reached just over 25 feet while

the inner bar was over 26 feet deep. Galvestonians had finally beaten their inland rival on the Bayou; trains loaded with grain and cotton by-passed Houston for the island (Alperin, 1977:43-55).

Galvestonians gloated briefly-their town was the largest city in Texas in 1880 with a population of 22,248 persons; it was followed by the army town of San Antonio with 20,550, Houston with 16,513, and Dallas with only 10,358 persons. A decade later railroad building changed the order with Dallas soaring to 38,067, San Antonio 37,673, and Galveston in third place with 29,084 while Houston trailed in fourth place with 27,557. Houston movers and shakers began working for their own deep water in 1896. Nature also came to their aid in the form of the devastating 1900 hurricane that took 6,000 lives and destroyed property on Galveston Island. Many businesses decided to move inland for greater safety. By 1900 Houston had moved into second place with 44,633 people following San Antonio, still swollen to 53,321 with its army posts after the Spanish American War. Galveston, however, dropped to fourth with only 37,788 behind third-place Dallas with 42,638. During the decade following the completion of the Houston Ship Channel in 1914, Houston led in population and has continued to outstrip her state rivals (*Texas Almanac*, 1964:122-126).

Congressmen were convinced by Houston lobbyists in 1896 that a fifty-mile-long waterway was vital to commerce and appropriations were made to deepen the Houston Ship Channel to Harrisburg but not all the way to Houston. The original plan was for a 150-foot-wide channel from Bolivar Roads to Morgan's Point and to dump the spoil west of the channel in the lower bay "so as not to interfere with the tidal basin." In the upper bay, a dike was to be built east of the channel to prevent silting during heavy storms. Funding limited the project and in 1900 the Corps began dredging an 80-foot-wide channel 17 1/2 feet deep with a pile and brush dike from Morgan's Point to Red Fish Bar. After the 1900 hurricane, and the projected abandonment of Galveston as a major port, appropriations were increased and the Houston Ship Channel project resumed, deeper and wider (Alperin, 1977:100-102).

By 1908 the Houston Channel was a little over 18 feet deep. A turning basin was dredged at Long Reach two miles above Harrisburg where wharves and warehouses provided a transfer point for cargoes coming by or destined for rail. Houstonians were not completely satisfied and in 1909 the civic leaders made a precedent-setting offer to pay one-half of the cost to deepen the entire channel to a depth of 25 feet from Bolivar Roads to the Turning Basin. Harris County voters created a county navigation district to issue bonds and the work commenced in 1912. The Houston Ship Channel formally opened on November 10, 1914 when President Woodrow Wilson pushed a button in Washington that set off a cannon at the Turning Basin (Sibley, 1968:129-145).

Other Dredging Projects in Galveston Bay

Commercial interests wanted other channels for barge traffic. One of the earliest was the Gulf Intracoastal Waterway, commonly called the Intercoastal Canal. Local entrepreneurs had tried to open a channel from Galveston through West Bay to the

Brazos River in the 1850s but technology was unable to cope with bank cave-ins. The Corps of Engineers surveyed the entire Gulf coast in 1873, but funding was delayed until 1905. By 1913, dredging was completed from 200 miles southwest of Galveston to the Bay and joined the Houston Ship Channel. A decade later the canal was connected to New Orleans (Webb, 1952:1746-47).

The businessmen who founded Texas City dredged a 16-foot deep channel from the Galveston Channel to their new port in 1895-1896. The Corps took it over in 1899 and by 1905, there was a 7-mile-long channel 25 feet deep. The Texas City dike began as a pile construction in 1913 in order to protect the channel, but was replaced in 1931-34 by a rubble mound that became a popular fishing facility (Alperin, 1977:91, 272).

Likewise, the developer of Port Bolivar petitioned Congress in 1907 for a 25-foot-deep channel to his new port where the Santa Fe Railroad was constructing a large wharf. Railway cars coming down Bolivar Peninsula from the east would be transferred to barges that carried them across the channel to Galveston. The first ship docked in Port Bolivar in 1909 but the 1915 hurricane destroyed most of the port and it was not rebuilt (Wiggins, 1990:78-79).

Beyond the time span of this chapter but relevant to the subject are later channels. With the prospect of increasing barge traffic, a channel was dredged to allow larger towboats to enter the Trinity River from the Houston Ship Channel in the 1950s. Subsequently shorter channels were opened from the main channel through the San Jacinto estuary into Cedar Bayou and Bayport while a channel into Clear Lake is popular with pleasure boaters. Likewise a side channel leads into Double Bayou in Chambers County (Nautical Chart 11325, Galveston Bay, Texas, 1975).

No thought was given at this time to damaging the ecology of Galveston Bay by dredging channels. The main focus of the developers was for cheap and efficient water transportation for bulk cargoes and reflected the popular sentiment of the day; natural features should be used, extracted, or improved for the benefit of society or the individual.

Increasing Population and Industrialization Threaten the Bay's Ecosystem: The Sewer Era and Efforts to Clean It Up, 1870-1992

Galveston Bay, like Chesapeake Bay, has struggled to maintain itself when the population of the area increased and advancing technology exploited the natural resources. Similar to the abundant marine life, the vast water system at first seemed impregnable to dumping foreign materials into the waterways, but by the 1960s fishermen, environmentalists, and recreational users of the bay began complaining about its deteriorating condition and urging that corrective steps be taken.

In 1973, James Noel Smith, an environmentalist, completed a study of the bay and noted hopeful signs that it might not "succumb to the voracious appetite...for growth and development" that disregarded environmental consequences. Yet the title of his article in the *Sierra Club Bulletin* was "The Doubtful Future of Galveston Bay" (Smith, 1973:25).

Houston and Galveston Water and Sewage Problems

As early as 1839 a visitor to Houston noted the amount of soil washing down Main Street and into the bayou after every rain that threatened to fill the steamboat landing. By 1841 the city forbade the steam sawmill at the junction of White Oak and Buffalo bayous from piling sawdust along the banks, again to prevent clogging the stream, not concern for pollution (Sibley, 1968:52).

Early Houstonians drew water from the bayou and collected rainwater in cisterns while those who could afford better, bought it from cartmen who filled casks at local springs. A newly arrived housewife in 1839 remarked that the bayou water was "*pleasant-but muddy...I don't wonder at all the clothes being spoilt that are washed in this water*" (Gray, 1967:151).

Houston's first waterworks was built in 1870. The contractor dammed the bayou above the Preston Avenue bridge for his intake pipe which would supply a reservoir and would pump water to fire hydrants and homes. The poorly planned system had many problems including insufficient pressure for fires. Complaints about foul bayou water led to drilling artesian wells, but the water was piped around in the same mains as the polluted bayou water. Cities did not begin to use chlorine to disinfect water until about 1910 and Houston did not use it until 1933 (McComb, 1969:127- 130).

Street drains and sewers emptied separately but directly into Buffalo Bayou through vitrified pipe and brick sewers (*The Industrial Advantages of Houston...*, 1894:5). By 1893 people said that fish died in the bayou from "creosote poisoning." The city engineer reported that solids from toilets appeared in the bayou and a newspaper reporter described a sewer pipe that was flushing 40,000 gallons a day from the Houston and Texas Central Railway shops into the bayou just above the dam. A committee of doctors reported that a dozen privies along the bank above the dam also contributed to pollution as did the old city smallpox graveyard, the cottonseed oil mill and the cattle yards and a dead cow. The cattle waded into the bayou and stirred the mud when drinking. Nevertheless, the city continued to use bayou water for emergencies. Finally the federal government forced the city to act when Houston began agitating for a deep water ship channel to come to the foot of Main Street in the mid-1890s. The Corps of Engineers said that the government "had no intention" of cleaning the sewage out of the bayou and the city had better get busy solving its problem (McComb, 1969:129-130; *Houston Post*, May 3, 1895).

The city built a sewer system in 1899 with a central pumping station on the northeast side where siphon pumps brought the sewage across the bayous. There it was forced through filter beds located nearly five miles outside of town. The heavy matter stayed in the beds and dried until workmen with rakes removed it. The remaining sewage was filtered through various layers and the final effluent entered Buffalo Bayou via an open canal. Six years later the filters were processing only half of the city's waste and the system was not working properly. More disposal plants were built but by 1916 the mayor estimated that from 70 to 80 percent of the raw sewage went directly into the bayou. A reporter also found 35 private sewers draining into the waterway (McComb, 1969:131-132).

Unsafe disposal of sewage continued and in 1967, Baylor University Medical School's Dr. Joseph L. Melnick, an expert on virology and epidemiology, found a wide range of bacteria and viruses including those causing encephalitis and meningitis in Buffalo Bayou. At the foot of Main Street, he said, were enough viruses to infect 77 million people every hour. By the early 1970s, the city treated its raw sewage with chlorine when it knew it was going untreated into the bayou (Smith, 1973:26). Twenty years later, Houston still discharges raw sewage into the bayou because of breakdowns in equipment and flooding (Benson, 1991).

How much of this sewage reached Galveston Bay or what was its effect was not discussed at the turn of the century. But when coupled with the island city's record and the practices of lesser cities rimming the bay, it was a factor in bay pollution. A notable outbreak of gastro enteritis occurred in Galveston after an oyster dinner in 1944 and raised temporary public concern for the safety of the bay oysters (Stanley, 1989:Chapter 7[pl3]; Ward and Armstrong, 1991:1).

Life on Galveston Island had unique problems because underground brackish water was only a few feet below the surface making wells impractical. The islanders depended

on cisterns until the 1880s when deep wells produced plenty of water but it too was brackish and ruined pipes. Finally the city contracted for deep wells on the mainland at Alta Loma west of Hitchcock and by 1895 the city had plenty of water although the water table at the source began to drop (McComb, 1986:102-104).

Likewise waste was a problem on the barrier island. At first private cartmen collected trash, offal, and slops from alleys and street gutters and dumped it all off the eastern end of the island. In the 1880s the city established a municipal dump on the bay shore at 33rd Street (McComb, 1986:99).

The *Galveston Daily News* estimated in 1875 [when the population was around 20,000] that 875 tons of fecal matter and over 2,000,000 gallons of urine were produced each year by humans in the city while horses manufactured 20 pounds of manure and 20 gallons of urine each day which was absorbed by the sand. The city physician complained in 1887 that the scavengers emptied the privies into barrels at night and the careless cartmen left a trail of "their horrible freight" all the way to the Gulf where it was dumped. Getting rid of surface water was a problem on the island and open ditches were used until the late 1860s when some were lined with wood. But the system was imperfect and streets became lakes when it rained. Even worse, some building owners connected toilets to the open drains. Between 1886 and 1893, the Galveston Sewer Company, a private contractor, laid pipes between the bay and Broadway from 14th and 27th streets (McComb, 1986:99-100). But there was no treatment plant on the island until after World War II. In 1901 all householders had to connect to city sewers and a city ordinance required the sewer company to have the main outlet into West Bay at the foot of 25th Street to be at least two feet below mean low tide to prevent unpleasant odors from escaping (Galveston, 1902:586, LXI; *Galveston Daily News*, 1884-1900 sewage articles).

Thus by 1900, Houston had made some improvements in handling sewage while Galveston and the smaller communities moved slowly from outhouses and cesspools (a forerunner of the more sanitary septic tank) to city sewers. Raw sewage continued to enter the bay but in the 1930s it received less attention from the public than did visible oil slicks and waste oil (Ward and Armstrong, 1991:1-2).

Galveston County officials conducted a study in 1950 and discovered that most of the municipalities around the bay dumped raw sewage into local waters. By 1963 Offatt's Bayou was so polluted that the city banned swimming while occasional cases of infectious hepatitis appeared and islanders complained about loose bowels. A federal panel dealing with water pollution visited the area in 1970 and found Galveston dumping raw sewage into West Bay. Nor did the port provide sanitary facilities for ships in the harbor. The city normally passed 7 million gallons of sewage per day and only 40 percent was adequately treated; during rainy weather when storm drain water overburdened the system, 25 million gallons might enter the bay. Acting under a threat of a daily fine by the Texas Water Quality Board, Galveston proposed to build separate storm sewers and

to chlorinate its effluent, but progress was slow. A fine of \$30,450 was imposed in 1974 for dumping raw sewage into Offatt's Bayou (McComb, 1986:203-204).

The Texas Water Quality Board was created in 1967 and assumed the regulatory duties of the Texas Water Pollution Control Board which had been mandated six years earlier. This seven-member board included the director of the Texas Water Development Board (concerned with encouraging the use of surface water), the state health commissioner, the director of Texas Parks and Wildlife, the chair of the Railroad Commission, and three appointees from the public. The board had the power to issue permits and control pollution (Branda, 1976:1084-1085).

Pollution from human waste is still a problem for Galveston Bay but industrial effluent, sometimes toxic, has caused concern since the turn of the century.

The Beginning of Oil Drilling in Galveston Bay and the Baytown Refinery 1903-1919

Baytown Landing on McKie Peninsula enclosing Black Duck Bay and Busch Landing on Goose Creek served the quiet agricultural communities on the east side of the San Jacinto estuary at the turn of the century. The only industries in the neighborhood were small boatways at Goose Creek and brick kilns along Cedar Bayou. Local fishermen often complained that the rising bubbles in Tabbs Bay, the usual sign of feeding fish, seldom resulted in a catch. In 1903 an inquisitive oil scout, inspired by the gusher at Spindletop on January 10, 1901, lighted a match near the mysterious bubbles and brought the petroleum era to Galveston Bay (Henson, 1986:74-75).

The first producing well was on the shore of Tabbs Bay in 1907 but production from it and other wells in the field was modest. By 1915 when the August hurricane brought sixty-mile-an-hour winds and a fourteen foot tide to Goose Creek, there were at least twenty-five wooden rigs working around Tabbs Bay producing about 130,000 barrels of oil per year. The real boom began in August, 1916, when Galliard #1 produced 8,000 barrels per day from a depth of 2,017 feet. Although production soon dropped, the following August saw Sweet #11-with a daily production of only 400 to 500 barrels a day-suddenly blew out spewing 25,000 barrels of oil over the area. Shooting 250 feet into the air, the gusher created a 2-inch deep lake covering ten acres! The south wind carried slimy green oil eight miles up the estuary to Highlands making the dirt roads too slippery for driving and coating the trees with shiny oil (Henson, 1986:78-79).

In 1918, a third August gusher, Sweet #16, erupted when natural gas sent the wash pipe through the crownblock wrecking the derrick. An expelled rock struck a metal fragment and ignited the gas; the resulting explosion rocked the countryside and the well remained out of control for eleven days. An estimated 10,000 barrels of oil created a slick on Tabbs

Bay and became the first reported ecological disaster when it floated down into Galveston Bay. The untidy oil field camp on Goose Creek became a boomtown of tents and shacks between 1917-1919, the years of peak production, with 7-9,000,000 barrels per year. By 1924 production dropped to only 4,000,000 barrels but the Goose Creek field remained the third largest in Texas following Humble and Sour Lake (Henson, 1986:80-82).

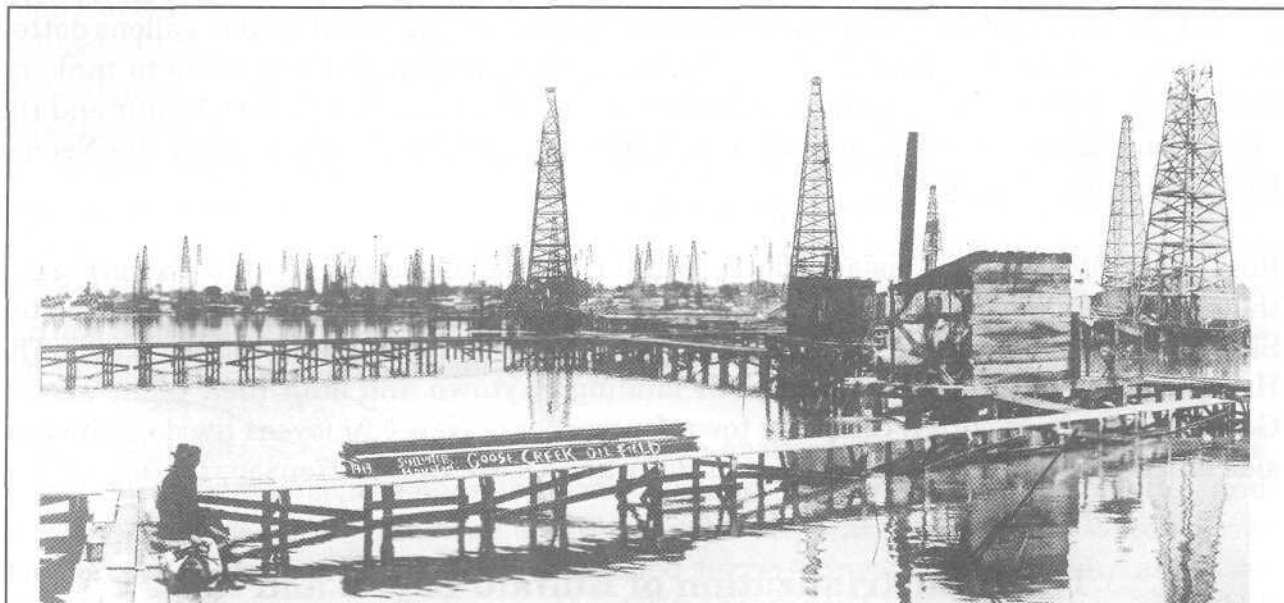


Illustration 1a.-Goose Creek Oil field. (Source: Rundell, 1977.)

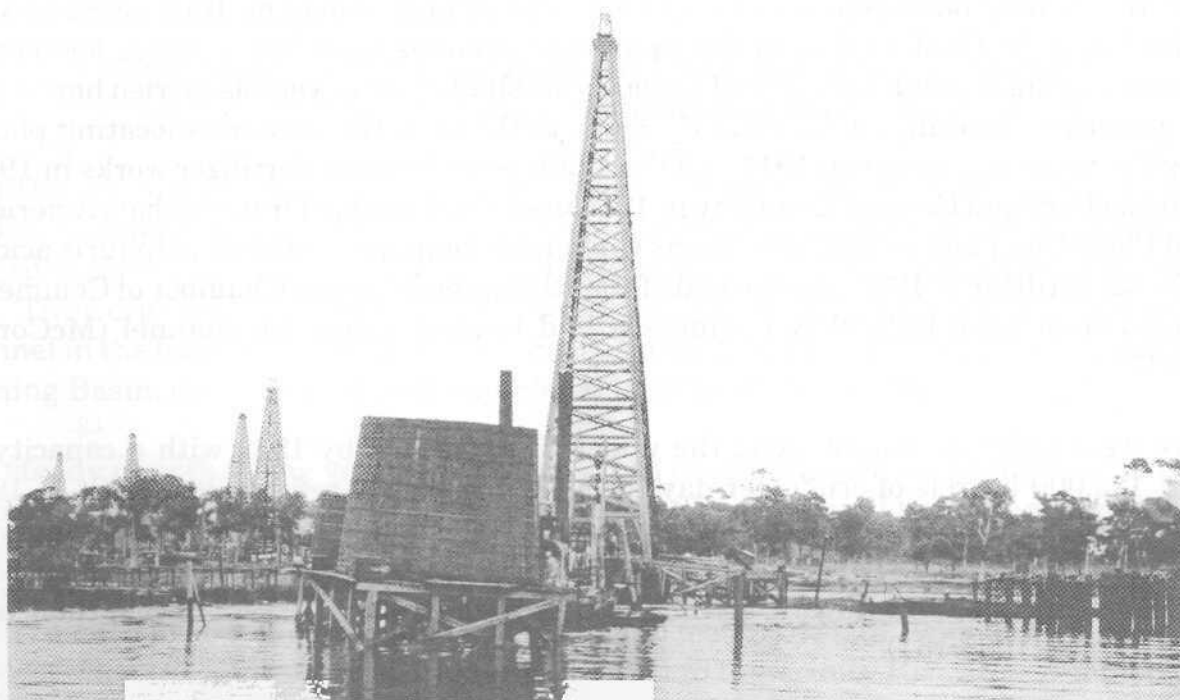


Illustration 1b.-Goose Creek field. (Source: Rundell, 1977.)

At this time Tabbs Bay and the shoreline had perhaps 1,500 wooden and steel derricks placed close together sometimes sharing a drilling platform with a neighbor. Those in the bay were connected by long, elevated walkways with small storage tanks, tool sheds, and boilers hanging over the edges. The rickety construction allowed crude oil to leak, drip, and spill into Tabbs Bay. At first drillers pumped the crude oil into huge shallow pits filled with water, but soon cypress storage tanks holding about 20,000 gallons dotted the shore and on Hog Island where four-inch pipelines carried the crude to tankers. Prior to 1919 the most convenient refineries were in Beaumont and Port Arthur and the major companies soon built pipelines from Goose Creek to their plants on the Neches River (Henson, 1986:82-83).

Ross Shaw Sterling and his associates in the Humble Oil Company (now Exxon) began their refinery at Goose Creek in 1919. The site was ideal being located on the Houston Ship Channel where large tankers drawing up to 22 feet could be accommodated. The Humble board of directors named their landing Baytown and built their plant west of Goose Creek along with a company town for workers. Non-employees lived on the east side of the creek in the communities of Pelly and Goose Creek (Henson, 1986:83-85).

The Industrialization of Buffalo Bayou and the Enlargement of the Houston Ship Channel

At the close of World War I in 1918 there were twenty-two industries along the bayou below the turning basin and sixteen above it. The stretch above the Turning Basin was dredged to a depth of 10 feet to the municipal wharves near Main Street for barges transporting shell, sand, lumber and cotton while shallow draft vessels carried hardware, and groceries (Alperin, 1977:111-113). Some of the earliest industries locating plants along the waterway between 1914 and the 1920s were Armour Fertilizer works in 1914; the Texas Portland Cement Company in 1916 used shell dredged from the bay; American Maid Flour Company in 1922; the Texas Chemical Company produced sulphuric acid in 1920 and fertilizer in 1922. By the end of the 1920s, the Houston Chamber of Commerce bragged that more than fifty businesses had located along the channel (McComb, 1969:117).

There were eight refineries along the upper ship channel by 1929 with a capacity of about 125,000 barrels of crude per day. The Galena-Signal refinery was built in 1916 (and was bought by The Texas Company in 1928), Sinclair completed its refinery in 1918, Deep Water in 1919, Humble 1919-1920, Crown Central, Clarion, and American Petroleum in 1920, and Royal Dutch Shell began its plant in 1929. All had their own docks (Sibley, 1968:161).

Texas City got its first refinery in 1908 and the site has continued under various names until the present, the latest being Texas City Refining, Inc. The 1930s brought Republic

Oil (later Marathon) and Pan American (Amoco) but it was World War II that brought increased industrialization. In 1941 Union Carbide opened and Monsanto leased the old sugar refinery to produce styrene for synthetic rubber.

Union Carbide became the largest industrial ethyl alcohol plant in the world and a large producer of polyethylene plastics made from "air, water, salt, and sulphur." The U. S. government built the tin smelter in 1942 which became the Gulf Coast and Metallurgical Corporation after the war. Texas City looked forward to more development after 1946 but the disastrous explosion of the ammonium nitrate fertilizer on board the *Grand Camp* at the docks on April 16, 1947, the resulting explosion of the *nearby High Flyer*, and subsequent fires at various shore installations ended the boom for dry cargo facilities. The port remains, however, a favorite location for the refineries and new chemical plants such as General Aniline and Film Corporation that opened in 1968 and produces high-pressure acetylene chemicals (Mabry, 1978:8, 16-17, 19-20).

All of these industries were attracted to the ship channel for its deep water, available acreage, local incentives, the abundant underground fresh water (usually on-site), and the ease of disposing of industrial waste into the air, water, and soil. Water-borne transportation companies, likewise, remained largely unregulated insofar as water pollution was concerned. Critics in the 1970s blamed the tangle of jurisdictional responsibilities and bureaucratic timidity for the lack of control over ship wastes (Smith, 1973:26).

Deepening and Widening the Houston Ship Channel and Public Concern over Industrial Pollution

By 1919 the petroleum industry wanted a wider channel for the increasing use of the relatively inexpensive barge traffic favored for the Houston Ship Channel. These barges ranged in length from 125 to 200 feet, 30 to 38 feet wide, and drafts between 6 and 15 feet. The Corps of Engineers recommended a depth of 30 feet in 1919 and widening the channel in the bay to 250 feet and in the San Jacinto River to 150 feet plus enlarging the Turning Basin, changes that were completed in 1926 (Alperin, 1977:111-112).

The steady growth in the volume of traffic led to deepening and widening the Houston Ship Channel during the 1930s to 32 then 34 feet. World War II brought a shipyard for Liberty Ships and other defense projects and spawned the petrochemical industry beginning with manufacture of synthetic rubber at Baytown and Texas City. The channel was deepened to 36 feet in the late 1940s and to 40 feet in the late 1950s. The 8-foot-deep 125-foot-wide cut from the Houston Ship Channel to the Trinity River was completed in 1960 for barge traffic (Alperin, 1977:113-114).

In the 1920s the public began blaming the petroleum industry for the decline in fishing. "It is a common thing for fishermen...to remark that times are not what they used to be when phenomenal catches were made," wrote the editor of the 1929 Texas Game, Fish, and Oyster Commission (TGFOC) annual report. He cited a *Houston Post-Dispatch* article in 1920 that declared fishing in the ship channel was ruined and that "Bathers often received generous coatings of oil." As early as 1910, the *Post Dispatch* said, the channel was smeared with oil and other destructive ingredients from the foot of Main Street to Morgan's Point (Ward and Armstrong, 1991:11). Oily water at the foot of Main in 1910 must have come from the careless use of fuel oil.

The TGFOC, however, noted improving conditions in 1928 when a clean-up campaign reduced waste oil which had posed "a grave fire hazard." Moreover, it bragged, the recent fishing season was the best in the past ten years. The ship channel was "virtually free" of oil pollution and the bay once more teemed with aquatic life. Yet problems continued and five years later the TGFOC praised the "honest effort" that the refineries were making to take care of their waste, blaming current pollution on inbound ships dumping waste in the bay. The agency report in 1946, however, noted a decline in bay fisheries and predicted low volume catches "until the heavy industrial pollution" abated. Channel-area polluters continued to receive criticism and within the past twenty years the ship channel has been described as "the most-polluted" waterway in the U. S. (Ward and Armstrong, 1991:11-12).

A plan to widen and deepen the Houston Ship Channel surfaced again in 1967 when a Congressional committee asked the Corps of Engineers to review navigation projects in the Bay (Davis, 1992). But the request came at a time when the public was becoming more aware of pollution damage in the air, water, and soil, and the study had to await the review processes instituted by the National Environmental Policy Act of 1969. The act forced industry, builders, and even the Corps of Engineers to file environmental impact statements (EIS) before commencing any project that might harm the environment (Alperin, 1977:277).

The Corps of Engineers issued its EIS for deepening and widening the Houston Ship Channel in 1988, but it was met by sizable opposition. Additional studies resulted in a second EIS to deepen the channel from 40 to 50 feet and to widen it gradually to 600 feet. How to dispose of the estimated 57 million cubic yards of mud, clay, sand, and shell remains under discussion in addition to the impact of dredging (Davis, 1992).

Water quality in Galveston Bay has improved. In 1980, a decade after passage of the National Environmental Policy Act, the Environmental Protection Agency announced that the Houston Ship Channel was a "water-quality success story" (Ward and Armstrong, 1991:12). Some recent scholars evaluating the quality of the water and sediment in Galveston Bay believe that in the past too much reliance has been placed on anecdotal material while overlooking variables such as cold weather, hurricanes, and floods. Their studies, more scientific in method, try to find measurable criteria for examination. In

1968 two agencies undertook a study of coliform and BOD levels in the bay-one by the Texas State Department of Health and another by the Texas Water Quality Board. These studies and more recent analyses conclude that definitive statements are difficult because of an insufficient data-base. The on-going efforts by the Galveston Bay National Estuary Program to assess the evolution of water and sediment quality in the Bay will make use of recent efforts to synthesize available data to produce a Comprehensive Conservation and Management Plan for Galveston Bay (Ward and Armstrong, 1991:12-14).

While past discharges by municipalities and industries have damaged water quality, there are other detrimental factors harming the bay including subsidence and erosion. Both are naturally occurring processes but the growth in population and industrialization has accelerated the problems.

Technical discussions about subsidence, erosion, and turbid water conditions either because of the increased population and industrial needs or the effect of the three on soil, water conditions, and fisheries are beyond the purview of a historian. From a historical perspective, however, the over-extraction of underground water and oil has contributed to subsidence around the bay. Communities relied on underground water instead of surface water because it was cheaper and quickly available, sometimes even on the site, while developing systems for the delivery of surface water took long-range planning for dams and canals. The creation of the Harris-Galveston Coastal Subsidence District by the Texas Legislature in 1975 has encouraged industry and agricultural irrigators away from dependence on underground water to surface water from Lake Houston (the San Jacinto River watershed) and the Trinity and Brazos rivers.

In 1887 the demand for subsurface water was about 2 million gallons per day which rose dramatically to 495 million gallons daily by 1972. By 1989, industry and irrigation consumed only 15 percent of the total subsurface water while the public used the remaining 85 percent. Some of the public consumption is being shifted from underground to surface water (Reynolds, 1984 and Teutsch, 1977 cited by Canales, 1991:125-126).

Subsidence clearly affected eastern Harris County in the 1970s. The San Jacinto Battleground lost some of its land *as* did Baytown's Brownwood subdivision across the San Jacinto River. This upscale subdivision perched on the high banks of a peninsula surrounding Scott Bay and was annexed to Baytown in 1961. Residents complained that every high tide left trash on the streets and that passing ships caused waves that were eroding the shoreline. High tides during Hurricane Carla in 1961 put three feet of water into many homes, but it was Hurricane Alicia on August 18, 1983 that doomed Brownwood. After the storm, Baytown cut off city services to the peninsula and barricaded the entrances while forbidding residents to repair their homes (Henson, 1986:138-140).

Experts estimate that the Ship Channel and the San Jacinto Monument have sunk nine feet while Pasadena and Baytown have lost about eight feet. Such loss of elevation causes flooding during heavy rains and tidal surges from hurricanes. These inundations

sever evacuation routes and endanger lives. Moreover, surges of salt water intrude into the freshwater and brackish habitats needed for plants and marine life thereby upsetting natural growth processes. Subsidence at Texas City resulted in the building of 16 miles of levees from 15 to 23 feet tall (Canales, 1991:129-130).

Thoughtless pollution and the extraction of underground resources spanning almost one-hundred years have damaged Galveston Bay and its surroundings. Public awareness during the last three or four decades has brought about slow change and has encouraged serious studies about ways to preserve the area and wisely use its resources.

Commercial and Sport Fishing and Bay Area Wildlife 1850-1990s

The same exploitive sentiment common among merchants and shipping interests regarding the use of Galveston Bay was also held by sportsmen and commercial hunters and fishermen at the turn of the century. The seemingly endless supply of marine life and waterfowl in and around Galveston Bay encouraged excessive harvesting.

Forest McNeir of Smith Point in Chambers County was typical of the small-time predatory commercial hunter just before the turn of the century when few limits regulated the harvest of waterfowl and oysters.

Unfettered Oystering and Bird Hunting 1880s-1915

Forest McNeir, later a successful Houston businessman, was the great-grandson of Cherokee chief Major Ridge who was murdered after being forced to move from Georgia to Oklahoma Territory in the 1830s. Forest lived with his widowed mother at the Smith Point home of his grandmother, Sarah Ridge Paschal Pix, the daughter of Chief Ridge (Henson and Ladd, 1988:65). She was as well-educated as white girls, having attended a special school for Indian girls and also a finishing school, and was married to a Texas lawyer until 1850. But the gold that she had inherited from her father had been squandered by her two husbands, and by 1880, Mrs. Pix had to live off the land and the produce of her ranch. Thus she and her grandsons viewed the wildlife as a means of support, similar to the ancient residents of the Galveston Bay.

About 1886 when he was ten, Forest and his brother sailed their skiff to Red Fish Reef, the nesting ground for thousands of gulls, to gather eggs. They also found many diamond back terrapins, and they caught about ten dozen which they sold for \$4.00 per dozen in Galveston. "I never saw any more diamond back terrapins when I got older...the speckled seagull eggs were just a little fishy, but pretty good scrambled" (McNeir, 1956:30).

Always in the need of money, the brothers began oystering in 1893 when Forest was seventeen. Although oyster harvesting regulations had begun and privately owned beds were allowed by the state, McNeir did not mention restrictions in his memoir. Perhaps they were not enforced, or he ignored them. The pair used tongs to harvest their catch, putting them into the 55 barrels on board their sloop. They took their catch to Houston where prices were better than Galveston—\$1.25 per barrel. While sailing off of Round Point, a 6-foot-long grandicoy (tarpon) jumped out of the water and struck the boom before it cleared the boat on the other side, leaving "scales as large as a silver dollar" (McNeir, 1956:65, 72).

McNeir began hunting ducks for the Galveston market at an early age and once saw 500 pairs of picked and cleaned ducks thrown overboard in the harbor when headwinds delayed the entrepreneur and the catch spoiled. In 1897 Col. W. L. Moody of Galveston hired the McNeir brothers as guides and men-of-all-work for his duck hunting lodge at Lake Surprise on the north shore of East Bay about six miles from Smith Point. The four-foot-deep lake was full of wild celery and attracted canvasbacks, blacks, and some redheads. "I have seen that lake covered with countless multitudes of ducks ...they completely hid the water...but they will never be seen again. They have vanished...When they rose all at once they shook the air, sounding like the roar of a freight train..."(McNeir, 1956:31, 73-74).

The ducks always arrived the first week in November and Col. Moody gave them several weeks to fatten up before inviting his guests. The McNeir's built twelve blinds about two feet above the water and about 10 feet back from the edges of cane and rushes; the colonel's blind had a rocking chair. They set out over 700 canvasback decoys in "stools" of about 60 each in front of the blinds. The McNeirs called the ducks and also had to shoot birds missed by prominent guests such as Texas Gov. James Hogg or William Jennings Bryan (McNeir, 1956:75, 77-78).

The guests were supposed to shoot canvasbacks, but they shot at anything including the small teals. Ever the businessman, Moody had McNeir cook the teals for the hunters' dinner, explaining to his guests that a canvasback was too large for one person and not large enough for two. The real reason was profit-Moody shipped the canvasbacks to market. After dinner the hired hands packed the canvasbacks in iced barrels, which McNeir loaded onto his sloop to take to Galveston for shipment by railway express to St. Louis, Chicago, and east coast cities (McNeir, 1956:79-80).

One evening during an icy norther, McNeir and a friend shot canvasbacks on their own for 45 minutes killing 192 birds with 300 shells. The next day he went out and picked up 3 dozen big hard-shell turtles that came up for air in the icy water but were too cold to dive back down. He sold them in Galveston for \$1.00 per dozen (McNeir, 1956:84.)

The good duck hunting at Lake Surprise ended by 1915. The lake filled with salt water during the 1900 hurricane and again in 1915 which killed the wild celery. Four years later the lake dried up during a long drought and the alligator gars, catfish, eels, snakes, and turtles died while the alligators left for better locations (McNeir, 1956:93).

The McNeir brothers also hunted jacksnipe for market. Between 1895 and 1899 their favorite hunting ground was on Lawrence Island in the Trinity-Old River delta. There were "millions of them," which they sold for \$1.00 per dozen with a contract for all that they could kill. The snipe were hard to hit because they flew "like a corkscrew for 25 feet" then leveled off fast. The dead birds were also hard to find, and McNeir tried to shoot them so they fell with the white breast up! "It wasn't fun for us, it was a living."

They camped out for a week to get sufficient birds and put the catch on ice every night until they had maybe 1,400 snipe. When he was in his seventies (1950s), McNeir wrote "the great marsh where I hunted as a boy has been fenced and posted, and today is dotted with oil wells...(McNeir, 1956:93-96)."

Commercial Fishing and the Need for Regulation, 1850-1913

As early as the 1850s, live turtles were shipped from Galveston Bay to New York before the days of local canning plants or mechanically-made ice. The species disappeared in the 1890s when over harvesting and two severe freezes combined to depopulate local waters (Hildebrand, 1981:2 quoted in Sullivan, 1988 as excerpted in Few, 1991:70-71).

The method of taking fish in the bay was catching the most possible and culling what you might not want. During the second half of the nineteenth century, commercial fishermen, and probably some individuals, used drag seines, set nets, baskets and pots, weirs (brushy dams), and fykes (long bag net) to catch flounder, drum, redfish, sheepshead, and also the less desirable fish in the bay. Rakes and tongs were used to gather oysters (Hofstetter, 1977:62 quoted in Sullivan, 1988 as excerpted in Few, 1991:72).

There was no effort at regulation until 1879, and then it was in favor of commercial fishing interests. Between 1879 and 1913 the Texas legislature passed sixteen laws establishing and protecting the private ownership of oysterbeds in the bays. The first act created private leases and prohibited oystering on public reefs from May to September. By 1887 the state extended protection to young fry, crabs, shrimp, and oysters and also established control over fisheries and specific commercially important species. The regulations set the tone for future management. The state legislature created the office of the Fish and Oyster Commissioner in 1895 to be appointed by the governor, and at the same time instituted a mandatory licensing program to protect fish, turtles, terrapin, oysterbeds and reefs. Unfortunately, few reports exist about the enforcement or the success of these early regulations (Sullivan, 1988 as excerpted in Few, 1991:72-73).

The man who became the first Texas Fish Commissioner, C. H. Stevenson, surveyed the situation along the Texas coast even earlier. In 1893 he reported the condition of Texas fisheries to the U. S. Fish Commission. Bay seining for menhaden (used for oil and fertilizer) was the primary fishing industry in Texas with oystering close behind. Fishing was a growing industry because of the availability of mechanical ice and rail transportation. Stevenson thought that the efforts to restrict the use of seines during the summer months as proposed by sport fishermen would cause economic distress to both commercial fishermen and the towns dependent on their income. He was, however, committed to building fish hatcheries in Texas for carp, rainbow trout, California salmon, and shad, and in 1890 planted 745 lobsters in the Gulf near Galveston, the latter experiment proved unsuccessful (Stanley, 1989:n.p. Chapter 7[1-2]).

Oyster and Mudshell Industries

Oystering and the mudshell industries are part of the history of the utilization of Galveston Bay, and while the marine scientists can argue about cause and effect, this historical overview traces only the major developments.

Oysters need clean, shallow, diluted salt water. Galveston's bays were conducive (though some say not perfect) to growth as can be attested by Red Fish Reef, the bane of the early navigators. Other large oyster beds stretched from Galveston Island across West Bay towards the mainland and also in the shallows north of Bolivar Peninsula.

By 1879 there was sufficient interest in the oyster beds by organized fishermen that the state surveyed the bay and leased certain reefs to private lessees. Other oyster beds were recognized as public. In a first step toward conservation, the state limited tonging to the winter months and banned harvesting from May through September (Sullivan, 1988 as excerpted in Few, 1991:72). By the 1890s, 153 acres in Galveston Bay were under lease and 2,000 acres in the early 1900s (Hofsetter, 1977 quoted in Sullivan, 1988 as excerpted in Few, 1991:72-73).

In 1885 there was a seasonal oyster industry in Galveston employing several hundred men. Most worked on small boats and used heavy tongs to remove the oysters from the bottom; later broad, four-foot-wide rakes were dragged across the beds and required a winch to deposit the load of shells on the deck. Other men were employed as oyster-openers for restaurants while others packed the unopened shells in ice for shipment by rail and steamer to distant markets (McComb, 1986:18).

Texas oyster production reached approximately 200,000 barrels (about 350,000 gallons) per year by 1904. These figures were considered a high-water mark and the beds began to decline, some covered with silt (Webb, 1952:2:144). The leasing of oyster reefs in Galveston Bay dropped to a low of 66 acres in the 1940s but rose slowly thereafter. While tonging oysters remained the common harvest method until the 1960s, the dredge was introduced in Texas waters in 1913. At first power dredging (a skiff with an outboard motor equipped to pull and hoist a dredge) was prohibited in shallow bay waters less than six feet deep, but in 1963 that was rescinded (Hofstetter, 1977:62 cited in Stanley, 1989:n.p. Chapter 7[11]).

Besides over harvesting and floods, another cause of the decline in the oyster industry at the turn of the century was the increasing demand for mud-shell (dredged oyster shell) for building material. While exploiting ancient oysterbeds, often buried under layers of mud, the dredges sometimes cut through live reefs and also stirred mud, making the water turbid (Webb, 1952:2:144). After the convenient shell piles along the shores—the old Indian middens—disappeared, having been hauled away to shell streets and walkways, entrepreneurs learned how to dredge through oyster shell reefs in Galveston

Bay. Shell beds were usually found in layers six to ten feet deep under the bottom mud; a few were as deep as eighty feet. As technology improved, huge dredges could easily reach reefs twenty-five feet below the bottom, bringing up the muddy shell. There was a ready market for shell which was used as a substitute for gravel on roads and railroad beds and was also used in producing lime and even chicken feed (McComb, 1977:18).

Prices for shell ranged from fifty cents to one dollar per cubic yard and because the beds belonged to the state, the Texas Game, Fish, and Oyster Commission levied a tax of five cents a cubic yard on the companies recovering the shell in Texas bays. During some years before 1950 as much as 20 million cubic yards of shell were dredged from Texas bays (Webb, 1952:2:144). By 1956 the Texas shell beds were running out, yielding less shell, and for the next decade, production averaged only 11,700,000 cubic yards annually. The main consumers were two Portland cement plants—one near Houston and the other near Corpus Christi. Conflicts arose between shell extractors and commercial oystermen and sports fishermen which led to more widespread concern for protecting the oyster beds (Branda, 1976:3:574-575).

Human waste and industrial pollution also affected the oyster beds by the 1940s, posing a health problem although not harming the oysters. Scientific research concerning sewage contamination began in the 1950s, and led to the state health department closing certain sections of the bay—including Offatt's Bayou—to oystering (Newkirk, 1987).

Nevertheless, oyster production resurged in the mid-1950s and did well for twenty years. A decline in the late 1970s lasted until the early 1980s when an all-time high of 7 million pounds were harvested in 1983 (Stanley, 1989:n.p. Chapter 7[10]).

Natural phenomena, particularly heavy rains, often cause trouble for oystermen. The unusually heavy rains in the fall of 1986 caused overflows that carried sewage into the Galveston Bay system. Oystering was closed down in the entire system including West Bay and remained closed until February, 1987. West Bay, however, was off-limits most of the 1987 season (Sullivan, 1988 as excerpted in Few, 1991:89-90).

Shrimping in Galveston Bay

Shrimp spawn offshore and the young travel into the less salty and sheltered bays to mature. During the fall and early winter, the adult shrimp return to the Gulf and repeat the process if not harvested (Webb, 1952:2:145). In the early days catching shrimp in castnets or in drag seines was usually a by-product of finfishing, although occasionally one could net 6-7-inch long shrimp in the shallows as described by Audubon in 1837 and the English visitor in 1841 (see chapter 2).

Shrimping in the bay was not considered profitable until the 1920s because few markets existed. Since then, it has become a recognized industry in the Galveston area (Sullivan,

1988 as excerpted in Few, 1991:73). Motorized boats pull a trawl, a long net suspended from a "Y" shaped frame, and after a suitable distance, pull in the net and cull the marketable shrimp while throwing other marine life overboard. The Bolivar cannery opened in 1923 and processed shrimp until the 1940s when better refrigeration and freezers made canning obsolete (Webb, 1952:2:145; Sullivan, 1988 as excerpted in Few, 1991:75).

By the mid-1940s bay shrimping expanded into the gulf waters when better nets were designed and boats discovered the rich off-shore brown shrimp beds in the deeper water. Post-World War II technology aided offshore shrimping with navigational equipment, diesel engines, and steel hulled boats. Bay shrimpers, on the other hand, harvest primarily the shallow-water white shrimp often used for bait (Sullivan, 1988 as excerpted in Few, 1991:75-76). During the 1950s and early 1960s, bay shrimpers often supplemented their income by harvesting oysters in the winter and sometimes these small family-harvesters also netted finfish (Sullivan, 1988 as excerpted in Few, 1991:80).

The Texas Shrimp Conservation Act was passed in 1959 and modified in 1963 which placed enforcement of the regulations under a single agency, the Texas Parks and Wildlife Commission. The act repeated and amended previous regulations and separated the inshore and offshore fisheries along with defining commercial activities such as shrimp house operations and bait dealers and required licenses. The act also recognized the growing importance of sport fishermen. Supplemental laws since then gave the TP&W the responsibility for conservation and fair usage of the freshwater and saltwater fisheries (Sullivan, 1988 as excerpted in Few, 1991:80-84).

Commercial Harvesters Versus Regulators and Sport Fishermen

The number of commercial fishermen in the bay tripled between the 1960's and the 1980s. Many Vietnamese fishermen relocated in Texas in the 1970s and the increased competition drew hostile reaction from local fishermen. Limited at first to inshore fishing because of their immigrant status and frugal by nature, the Vietnamese were resented for their success. Local fishermen, already suffering from the downturn in the economy, accused the newcomers of violating the law and also of being subsidized by the government (Sullivan, 1988 as excerpted in Few, 1991:85).

The arrival of the foreign fishermen coincided with changing state policies. The areas open to commercial offshore shrimping was restructured with the federal and state governments jousting for control. In 1981 a temporary moratorium was placed on issuing new bay and bait shrimp licenses (Sullivan, 1988 as excerpted in Few, 1991:85-87). Controversy arose between all factions—the various commercial fishermen of all kinds and sports fishermen due in part to the hard times. Those who made a living from fishing resented sportsmen while avocational fishermen considered commercial fishermen greedy and careless.

Competition for finfish intensified between 1977 and the mid-1980s when laws curtailed commercial fishing for redfish and speckled sea trout in the bay and near-shore coastal waters. Both species had been declining and the state action was in response to sportsmen who claimed the commercial fishermen were over harvesting. At first the regulations banned monofilament nets, forbade the use of nets, seines, and trotlines in the bay on weekends during the summer season, and limited the pounds of redfish that could be caught. But in 1981 the legislators banned all commercial harvesting of redfish and speckled sea trout with a \$200 fine for each fish, a crippling blow to the industry. Many finfishermen turned to harvesting shrimp and oysters instead (Sullivan, 1988 as excerpted in Few, 1991:88-89). The 1981 ban on commercial harvesting seems to have had little short-term impact on sports fishermen's catches as of 1989 (Stanley 1989:n.p. Chapter 7[23]).

The bay harvesters have become sharp critics of the policies that allow environmental harm and the gradual loss of habitat. They complain that they have little power to alter the course of residential and industrial developers, oil and gas exploration and drilling, marine commerce, and shell dredging. Besides industrial and human waste, there are oil spills, leakage, and bilge pumping that damage the estuaries and marsh nurseries. They also note the dams on the Trinity River that cause changes in the salinity which in turn affects marine life (Sullivan, 1988 as excerpted in Few, 1991:91).

There are other agricultural and industrial practices that affect the fisheries. Pesticide run-off is a concern of the commercial harvesters, especially the now-banned DDT that was used on the rice fields in Chambers County in the 1950s and which settled in the bay waters and may be imbedded in the silt. Some fishes adapted but developed visible tumors; these continued to go to market until the 1960s when the TP&W issued warnings (Becker, 1991). An additional concern for some people is the heated water discharges into the bay at the various Houston Lighting and Power Company plants. While the power company cools the water used in generating electricity before returning it to the bay, some accidental discharges have caused complaints from environmentalists (Roof, 1991). Nevertheless, research to date does not show significant long-term detrimental effects from these discharges. In the short run, these heated water areas attract recreational fishermen.

Two Corps of Engineer projects also have upset fishermen. The plan to dam the lower Trinity River below Wallisville, known as the Wallisville Lake Project, began in 1952 to provide water for Chambers County rice farmers and improve navigation. To get wider support, the plan was enlarged to supply water for municipalities plus industrial and agricultural interests in Liberty, Harris, Jefferson, and Galveston counties. The Corps also promised recreational parks with boat ramps. Land owners whose acreage would be flooded objected in 1960 but failed to stop the initial work which began in 1966. The passage of the National Environmental Policy Act in 1967 forced the Corps to undertake environmental impact studies. Environmental groups and shrimpers joined the

landowners in protesting, and in 1973 a district judge issued an injunction to stop work. The Corps appealed the decision and the court ordered a second environmental impact study in 1974. Even though the dam was 75% completed, the Corps reconsidered in 1977 and recommended that a smaller reservoir be built and ordered an archeological and historical study made of the new area to be flooded. The revised proposal emerged in 1983 and the Corps asked that the injunction be lifted. The matter dragged on for three more years when the judge refused (Henson & Ladd, 1988:117-118). However, the decision was overturned in 1987 and the modified project is again underway. Critics still insist that the dam will negatively impact the amount of fresh water entering Trinity Bay which, they say, will ultimately damage the nurseries.

The second project is the 1987 plan to deepen the Houston Ship Channel by 10 feet and widen it 200 feet beyond its present width through the bay. Fishermen believe that dredging the silt which is contaminated with toxins and heavy metals will increase turbidity and harm marine life. Where to deposit the dredged spoil is a vital issue. The first EIS report in 1988 was not satisfactory and a second one was ordered. A "beneficial uses" plan to use dredged material in strategic sites is part of the studies being carried out to prepare the new EIS.

The Economic Importance of the Fisheries

The economic impact of the fisheries varies from year to year because the harvest can be affected by such uncontrollable phenomena as severe cold and flooding plus harmful spills of petroleum, petrochemicals or other products. A 1985 report showed that the bay fisheries produced 1.2 million pounds of finfish, 5 million pounds of bay shrimp and possibly 12 million pounds of gulf shrimp, 1.5 million pounds of crabs, and 1.3 million pounds of shucked oysters during the year. Not only do the fishermen depend on the bay for a livelihood, but a variety of other economic enterprises ranging from bait shops to restaurants can be affected by the health of harvests. As a result, suspected threats to the bay's well-being are monitored carefully. For example, the U. S. Fish and Wildlife Service estimated in 1985 that the proposed dredging in Galveston Bay might decrease the oyster harvest from 60 to 80 percent (Grissom, 10-8-85).

Volunteer Efforts to Monitor the Bay

Volunteer groups also observe conditions in the bay. The Galveston Bay Conservation and Preservation Association is a long-time watch-dog organization made up mostly of residents from the bay area. The Galveston Bay Foundation, established in 1987, is a non-profit organization open to anyone interested in preserving and enhancing the bay. Its membership includes representatives from sport and commercial fishing, government agencies, recreational interests, business and shipping interests, and environmental groups who want to identify problems and seek solutions. Its focus is on education,

conservation, research, and advocacy. The GBF and other local interests were instrumental in establishing the Galveston Bay National Estuary Program; state and federal program efforts of this type were established in 1987 by the Federal Water Quality Act to assess trends in water quality, natural resources, and use of estuaries.

The Galveston Bay Foundation has developed an active volunteer monitoring program. Since 1987, GBF members have reviewed applications for permits from the US Corps of Engineers that might affect the bay's wetlands. GBF citizen monitors measure water quality and record observations of general conditions using procedures that have been approved by TNRCC and EPA so that the agencies can accept and use the monitoring data. The GBF program is affiliated with the statewide Texas Watch Program of the Texas Natural Resource Conservation Commission. At the end of 1992, GBF had 27 citizen monitors working at 21 sites around the bay (Shead, n.d). Another Galveston Bay monitoring effort, called Bay Watch, includes many professional fishing guides and others who are on the water a great deal. Texas A&M University's Marine Department at Galveston trains the Bay Watch volunteers to take water samples, note spills and fish kills, and report illegal trash discards and fishing practices such as the use of gill nets (Grissom, 4-17-91).

The dire warnings in the 1970s that Galveston Bay was dying have gradually brought more public concern and created demands for reforms to improve water quality. Environmental regulations and changes in industry practices have resulted in some success stories. There is more interest now in preserving the fisheries for both recreational and commercial use. Efforts to increase public awareness of the fragile nature of the bay and the importance of its marine life are on-going.

Galveston Bay Over 14,000 Years: A Summary

For over 13,000 years humans used Galveston Bay and its environs as a source for sustenance, mainly food. The only changes they made were the gradual accumulation of piles of discarded shells from oysters, clams, and other trash scattered around the waterways.

The first European explorers between 1528 and 1722 found simple nomads harvesting the bounty of the bay and its shores. Finding no mineral riches, Europeans and first generation descendants visited Galveston Bay during the eighteenth century in order to trade manufactured goods to local river dwellers for desirable products of the forests. Nevertheless, efforts were made by both the French and the Spanish to map the promising bay. By 1815, the convenient harbor at Galveston Island attracted filibusters and privateersmen who claimed to be aiding Mexican republicans to gain independence from Spain. By 1822, Anglo American settlers began arriving intent on taming the wilderness around the bay in keeping with their nostalgia for their former homes.

It is only in the past 150 years that humans have severely altered Galveston Bay in the name of progress. A rapid geometric increase in population coupled with changing technology encouraged people to focus on the bay as a transportation system to aid settlement and the economic development of the area.

Exploitation of the area's natural resources was considered efficient and a positive good between 1850 and 1950. Over harvesting of turtles and oysters before the turn of the century almost wiped out both species. Beyond careless wildlife management, a development mind-set encouraged and allowed depletion and pollution of the basic elements.

To serve the ever-increasing population and the needs of mid-twentieth century industry and agriculture, underground water was exploited, resulting in subsidence, erosion, and silting. When subsurface water proved insufficient for modern needs, dams and canals brought surface water to the residents, farms, and industries around the bay and at the same time negatively affected the salinity in the bay's marine nurseries. In a similar mind-set, human and industrial wastes were dumped thoughtlessly without treatment into the waterways, soil, and air until health and esthetic demands raised a public outcry in the late 1960s.

When doom-sayers predicted the death of Galveston Bay in the 1970s, it was only hard-working optimists who were able to effect the necessary changes to improve the great estuary. Today, many diverse interests have recognized the importance of Galveston Bay to their lives and livelihoods. As a result, broad based efforts to protect the bay ecosystem are underway.

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