
CHAPTER EIGHT SHORELINE DEVELOPMENT

The shore speaks to something in us all; few are they who would not like a house on the beach with an unimpeded vista of water over which to view the sunrise or sunset, a pier for boating or fishing, and a pleasant place to swim. The attractiveness of the shore bears in it the seeds of its own destruction: As more people live and work on it, its beauty declines. More important, development often upsets the natural balance of the shore ecosystem and contributes to the decline of water quality. The limited quantity of shoreline creates another problem: people who own portions of it are reluctant to allow others access to their land, effectively denying them access to water bodies that are clearly public.

Galveston Bay's western shoreline is highly developed with industry and densely populated cities. The eastern shore is much less developed. The bay is experiencing rapid changes in its shoreline. Many of the shorelines are unstable and are moving landward at rates ranging from a few feet to a few tens of feet per year (Morton and Paine, 1986, p.1). These shoreline changes are often accompanied by loss of wetlands, which are necessary to the continued health of the bay.

The regulatory framework for shoreline protection can be divided into two components: 1) federal and state laws intended to protect dunes and wetlands and, in the case of Texas, to insure beach access; and 2) local land use regulations. In this section, we review the federal and state laws only briefly, because Galveston Bay does not have many dunes or beaches. We do describe the federal Coastal Zone Management Act in some detail, because of the important implications it will have for Texas when the state's plan becomes effective, along with the state law that laid the groundwork for Texas participation in the program. We focus more on local governments, an important component of any comprehensive baywide management plan that has not received much attention in preceding chapters because of their relatively smaller role in managing those problems.

As we review local governmental power and actions, it is important to remember that any shoreline development involving land up to mean high tide requires a permit from GLO. Development above the line marking the end of state jurisdiction can still have important environmental effects, however, and it is those projects we consider here.

LOCAL LAND MANAGEMENT AND ECONOMIC DEVELOPMENT

Bay Area Growth and Economic Development

Growth management is perhaps the most serious of all the problems facing Galveston Bay, because it poses most starkly the conflict between economic development and environmental protection. Yet it is the problem least amenable to a coherent resolution, because land use is controlled only by localities. Under Texas law, only incorporated municipalities have the power to zone property; counties may not do so unless explicitly authorized by the state. Counties may create other political subdivisions such as drainage districts to perform environmental functions. However, the general effect of Texas law is to limit growth management functions to municipalities.

Rapid population growth and economic development on the Texas Coast during the last two decades have placed increasing pressures on coastal resources and intensified conflicts among competing interests. Approximately 2.8 million citizens live in the city of Houston and related suburbs and inhabit the shoreline extending from the San Jacinto River to upper Galveston Bay. Houston is one of the fastest growing areas in the nation, including both permanent residence housing developments and tourist-related industries. Of the counties along the entire Texas coast, the four near Galveston Bay—Chambers, Brazoria, Galveston and Harris—represent 75 percent of total shore county residents and 20 percent of Texas residents. Table 8-1 describes the rate of growth in the Houston Metropolitan Statistical Area over the last three decades and projected growth to the year 2000.

Following the period of most rapid population growth came a period of severe economic stringency. Unemployment rose severely, as Figure 8-1 shows. Economic problems actually exacerbated pressures on the coast as cities fought with each other to lure new development regardless of long-term environmental costs.

Among the environmental problems associated with increasing population and shoreline development are erosion and bulkheading (see chapter 12), loss of wetlands and associated habitat (see chapters 6 and 9), subsidence related to increased ground water withdrawal (see chapter 12), degradation of water quality from both point and nonpoint sources (see chapters 3 and 4), and dredging for construction (see chapter 6). In short, shoreline development contributes to every one of the other problems identified as most serious for Galveston Bay; however, most development consists of private commercial or residential projects which may not be regulated under the criteria described in the preceding chapters. Even when the projects are regulated, the controls follow or limit the damage, rather than preventing it. Only land use regulation can prevent shoreline development. Land use regulation is largely a local prerogative in Texas.

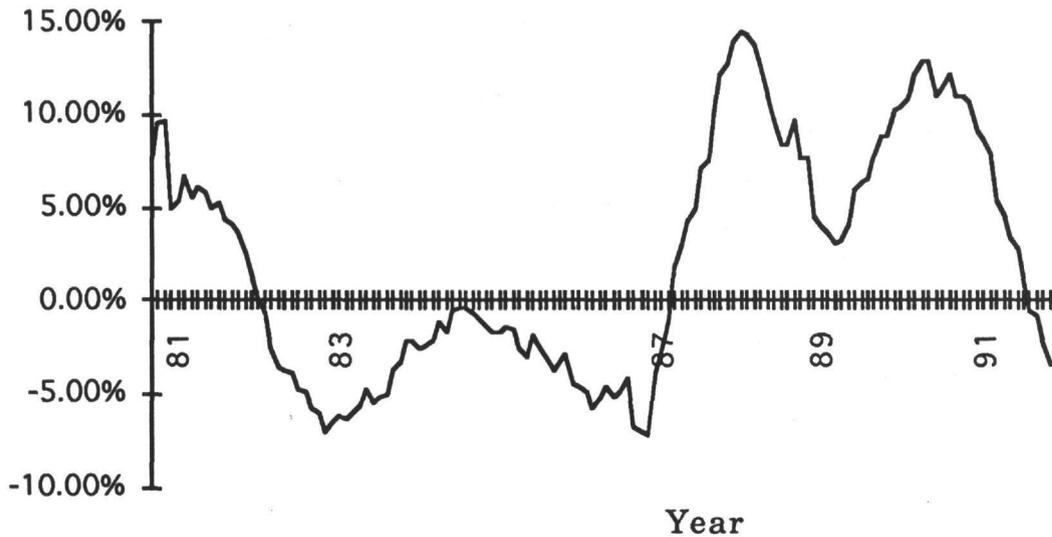
Table 8-1
Growth in the Houston Metropolitan Area 1960-1990

County	1960	1970	1980	1990	2000*
Chambers	10,379	12,187	18,538	21,310	22,955
Harris	1,243,158	1,741,908	2,409,547	3,078,356	3,584,883
Galveston	140,364	169,812	195,940	228,833	246,490
Brazoria	72,204	108,312	169,587	206,657	235,848

* projected.

Source: National Oceanographic and Atmospheric Administration (NOAA).
 March 1988. Galveston Bay: Issues, Resources, Status and Management.
 Washington, D.C.

Figure 8-1
Change in Unemployment in the Houston Metropolitan Area
1981-1992 (percent)



Source: Compiled by author from economic census data.

Table 8-2
Local Economic Incentives

City	Enterprise Zone Tax Abatements	
Alvin	N	Y
Anahuac	N	N
Angleton	Y	Y
Baytown	Y	Y
Deer Park	N	N
Dickinson	N	N
Friendswood	N	Y
Galveston	Y	Y
Hitchcock	N	N
Houston	N*	N*
Kemah	Y	N
La Porte	N	Y
La Marque	N	Y
League City	Y	N
Pasadena	Y**	N
Texas City	Y	Y

* Houston has Tax Increment Zones

** Pasadena does not recognize the term "tax abatement". The city offers to deannex land for industrial use and then set up a special tax rate for the business.

Galveston Bay As An Economic Resource

The conflict between development and environmental protection is made much more complicated by the fact that the environmental quality of the bay is itself an economic resource.

The bay's economic benefits are outstanding; annually, commercial fishing contributes over \$167.6 million, recreational fishing represents another 433.2 million. When combined with expenditures for other recreational activities, Galveston Bay reaps \$744.2 million. In sum, annual benefits derived from the estuary exceed \$911.8 million. When the indirect and induced benefits are totaled the Bay's total annual economic input is well over \$2.74 billion (TWC, 1988,p.1).

GBNEP sponsored a study of the socioeconomics of Galveston Bay. While oil and shipping constitute the two largest economic uses of the bay, other uses more dependent upon maintaining the environmental quality of the bay are also important. More than 100,000 pleasure boats are registered in the four-county area, and the tourism industry in the four counties, presumably closely related to the bay, generates nearly \$800 million in payroll and more than \$3.5 billion in travel expenditures (Environmental Institute, 1991). Sport and recreational fishing, birding, walking on the shore, swimming, and water skiing are also activities dependent upon the quality of the bay. These are the very activities that local residents as well as tourists enjoy:

Table 8-3
Recreational Uses of Galveston Bay

Recreational Activity	Percent Active
Swimming	47
Windsurfing	5
Sports fishing	39
Water Skiing	12
Sailing	21
Power boating	25
Crabbing	26
Picnicking	50
Walks on shore	62
Birdwatching	56
Jet skiing	5

Source: Environmental Institute, 1991, Table 3.3 appendix.

The other side of the coin of the economic value of a sound bay is the loss associated with environmental degradation. Galveston has spent millions of dollars in an effort to restore its revenue-generating beaches. Cities near Highway No. 87, farther down the Texas coast, which has had to be closed due to shoreline erosion, feel the effects of increased isolation. As noted in chapter 4, cities also bear high costs when they have to develop methods for treating stormwater contaminated by nonpoint source pollution—costs that would be avoided if the pollution were prevented. There are no estimates of these costs, but they should be included in any assessment of net economic benefits of shoreline development.

Proposed Development

The competing concerns described above are illustrated by a recent development proposal—Texas Copper. A subsidiary of Mitsubishi Metal Corporation, Texas Copper was seeking to build a \$200 million copper smelter. Texas Copper had submitted a plan to dredge for a barge channel connecting the plant to the Intracoastal Waterway. The company proposed to offset the dredging of approximately 2.5 acres of bay habitat by creating 2.5 acres of oyster reef east of Swan Lake, north of the barge canal.

On October 3, 1991, the Texas Water Commission granted Texas Copper a permit to discharge effluent into the shallow bay. An environmental battle ensued after it was discovered that the firm would be discharging 22 million gallons of effluent into the bay each day. The Texas Sierra Club, the Galveston Bay Conservation and Preservation Association, the Galveston Bay Foundation, and the Houston Audubon Society opposed the plant because of the size of the discharge and the composition of the proposed air emissions, which would contain heavy metals including lead, arsenic, zinc, and copper (Houston Chronicle 1990a, p. 25).

Fishermen believed the smelter would further diminish the reputation of Texas shellfish, already battered when one of Houston's largest supermarket chains decided not to sell shellfish from Galveston Bay and the state of California required bars selling oysters from Texas to post warning signs which inform its customers that eating raw oysters could be hazardous to their health (Barth,1991,p. 59).

Proponents, including labor unions, chambers of commerce, and politicians, were swayed by the 200 new jobs and \$30 million annual increase in personal income promised by Mitsubishi (Houston Chronicle, 1990b,p.1b and 1990c, p. 25). In Texas City, local school and county taxing authorities provided enticing business incentives by providing Texas Copper with tax abatements and by pledging \$7 million in public services (Barth,1991,p. 60).

On March 12, 1992, the Mitsubishi Materials Corporation announced that it was canceling its plans to build the smelter. According to Jim Blackburn, founder of the Galveston Bay Foundation, "Texas Copper demonstrated incompetency in negotiating modern environmental law and bad faith in negotiations with the environmental community" (quoted in Galveston Daily News, 1992, p.12a). Cancellation of immediate plans for building the smelter were accompanied by withdrawal of petitions for permits.

Summary

Point source and nonpoint source pollution, erosion, habitat loss, and subsidence are not only environmental threats but they can be threats to the economic stability of a region heavily dependent upon its water and beaches. Recent state and federal legislation designed to more closely regulate point source discharges and to further protect coastal areas cannot fully overcome the importance of the local role in protecting the shoreline.

Local governments have taken increasing responsibilities for ensuring the quality of their water, but counties and local governments have not been as responsible with other coastal management initiatives. Most coastal mandates are still the responsibility of the state. The lack of zoning provisions focusing on environmental protection coupled with programs which allow cities to abate taxes that could be used to limit the adverse environmental effects of growth bespeak a weak will to protect Galveston Bay at the local level.

One means of protecting the shore is to acquire land on it. In present times of economic stringency, cities, counties, and even the state may be hard-pressed to acquire new land, especially to hold it untouched. In order to determine the extent of land that is already publicly owned and might serve to preserve the shoreline, we asked the cities and counties in the bay area for maps showing their parks and other lands they own. Only two of the cities and none of the counties could comply. The absence of such basic data as an inventory of publicly-owned lands on the bay shore suggests not only a lack of political will but a lack of capacity among the small cities in the bay area.

FEDERAL AND STATE COASTAL MANAGEMENT

Coastal Zone Management

The federal Coastal Zone Management Act and Texas' present efforts to establish a program under the act are the most important statewide coastal management efforts. The act, passed in 1972, authorizes a national program to limit unwise use of coastal land and water resources and to protect them. It also provides funds, policy guidance, and technical assistance to states and territorial governments to help establish and maintain coastal management plans that meet federal regulations. In the 1980 amendments, Congress added more goals: to provide for management of coastal development and to minimize loss of life and property caused by improper development in flood prone areas, areas of subsidence and salt water intrusion and by destruction of natural protective features such as beaches, dunes, wetlands and barrier islands. Control of nonpoint source pollution was added during the 1990 reauthorization.

Under the law, states receive assistance from the National Oceanic and Atmospheric Administration (NOAA) to develop plans for managing coastal development. If the plan meets national standards, the coastal zone management office approves the state plan and provides some funding. Once a state plan is adopted, all federal activities in the plan area must be consistent with the plan. Thus participation in the CZM program greatly enhances a state's ability to control development and other activities on the coast.

Of the 35 eligible states, 28 have approved state plans. Texas is the only Gulf state without a plan. However, Texas is now moving towards participation in the program and may receive full approval from NOAA as soon as spring 1994. Texas' first effort to join the program began with passage of the Coastal Public Lands Management Act of 1973, which placed supervision of state-owned submerged lands under the authority of the General Land Office (GLO) and called for the necessary research and planning. After several years of work, however, the state failed to approve the plan.

In 1989, the Texas Legislature passed Senate Bill 1571. The law gave the GLO the lead role in developing a comprehensive, long-term coastal management plan. Under the law, the Texas Land Commissioner appointed a Coastal Management Advisory Committee. The Committee held public meetings in 1990 to help define the critical issues the plan should consider. Three major issues identified by the committee and the public hearings were coastal erosion/dune protection; wetland loss; and beach access.

Based on these findings, GLO drafted Senate Bill 1054, the Coastal Management Plan for State-Owned Wetlands Act, and Senate Bill 1053, the Coastal Management plan for Beach Access Preservation and Enhancement, Dune Protection, and Coastal Erosion Act. In 1991, the legislature passed both laws. SB 1053 is discussed below under other federal and state legislation.

Senate Bill 1054 calls for state policy to provide for more effective and efficient management of coastal natural resource areas. The Coastal Coordination Council, consisting of the Land Commissioner, the Attorney General, the chair of the Parks and Wildlife Commission, the chair of the Texas Water Commission, and two citizens, replaces the governor as the state's representative in negotiations with the federal government. The bill thus laid the groundwork for Texas' belated participation in the federal Coastal Zone Management Act.

Some goals of the Coastal Management Plan include:

- 1) Develop coastal erosion demonstration projects to show the feasibility of different methods of slowing coastal erosion or alleviating the current deficiency in the sand budget;
- 2) Manage placement of dredged material to replenish eroded areas as appropriate, establishing guidelines for stockpiling beach-quality dredged material that incorporate grain size and toxicity level standards;
- 3) Increase planting of vegetation as a low-cost means of inhibiting bayshore erosion;
- 4) Design a state program which can be certified under the 1988 Upton-Jones Amendment to the National Flood Insurance Act. Establish development guidelines and setbacks in coastal areas based on historical rates of shoreline erosion;
- 5) Support research and nursery projects to develop and cultivate disease-resistant vegetation adapted to local conditions. Seek government and private help in this effort;
- 6) Require new dams, groins, and other structures which impede sand movement to be constructed with sediment bypassing systems, and, when feasible, retrofit existing structures to allow bypassing;
- 7) Increase efforts to educate the public about the causes of erosion and the importance of barrier islands, dunes, and bays as a natural defense against storms and hurricanes;
- 8) Evaluate the feasibility of bypassing sediment at dams to allow it to reach the coast; and
- 9) Appoint the GLO as the lead state agency for coordinating erosion response planning among appropriate local, state, and federal agencies.

GLO is moving rapidly to implement the new law and, as noted, preparing to enter the federal Coastal Zone Management program. Just as the federal program will allow the state to ensure that federal projects are consistent with the

plan, the state law allows the Coastal Zone Management Committee to ensure that state and local projects are consistent with the plan. This authority provides a mechanism for enforcement that can make the plan more than just a paper document. Should NOAA fail to approve the Texas plan for CZM, the Coastal Council could still ensure consistency of state and local projects on state-owned lands which, of course, include all lands up to mean high tide.

Other Federal and State Legislation

The Coastal Barrier Resources Act of 1982 limits federal financial assistance that would have encouraged development in undeveloped coastal barrier areas and generally attempts to prevent or slow development in those areas. The act requires the Department of the Interior to develop a series of maps of undeveloped coastal barriers along the Atlantic and Gulf Coasts and establishes these areas as the Coastal Barrier Resource System. The state coastal zone management agency or, in the case of Texas, the governor, is directed to prepare a report and coordinate federal and state activities. The act does not prohibit development, only reduces federal subsidies, and it applies only to undeveloped coastal barriers. In 1988, the Department of the Interior identified 790,000 acres of coastal barriers that qualified as undeveloped and were not already included under the purview of the law. During the 1990 reauthorization of the act, Congress protected some of this area, primarily in the Florida Keys and the Texas Boca Chica wetlands.

Much of the state's legislation concerns beaches and sand dunes, which constitute a barrier to damage by hurricanes and erosion. The laws are characterized by an internal conflict: on the one hand, they attempt to ensure public access to beaches, while on the other hand they attempt to limit damage to beaches. The Texas Open Beaches Act of 1959 focused on the first goal, securing for citizens' the right of free and unrestricted access to Texas' public beaches. Public beaches extend from the line of mean low tide to the line of permanent vegetation on the shoreline bordering the Gulf of Mexico. The act prohibits dune walkovers and other dune protection projects from preventing free access to the beaches. It is the responsibility of the Attorney General's office to determine whether the various dune protection projects violate the provisions of the act.

The 1973 Texas Dune Protection Act grants the commissioners' court of any Gulf county north of the Mansfield Ship Channel with a barrier island or peninsula within its confines the authority to establish a dune protection line on the gulf beach. The line's maximum is 1,000 feet landward of the mean high tide line. Anyone requesting an activity seaward of the line must apply for a permit through the General Land Office. The GLO reviews the application along with the county dune protection committee. In 1990, Nueces and Brazoria were the only counties with an established dune protection program. Since then, Galveston and a few other cities have instituted regulations aimed at dune protection.

The Federal Emergency Management Agency also prohibits human alterations of sand dunes which could potentially cause increased flooding. The dunes which bear the brunt of storm activity are called foredunes; they are classified as

"coastal high-hazard areas" or "V-zones". A V-zone is a special flood hazard area extending from offshore to the inland limit of a foredune along the open coast, and any other area subject to high velocity wave action from storms or seismic sources. GLO enforces this provision in its permitting process.

Senate Bill 1053, passed in 1991, increased the powers of the GLO and local governments to protect public access to beaches, protect sand dunes, and prevent coastal erosion. Coastal counties had no authority to manage beaches in unincorporated areas or ability to create enforceable beach policies; this law provides those powers.

The City of Galveston has taken independent action to protect sand dunes. The zoning standards of the City of Galveston require that a Dune Improvement Plan be submitted to the city whenever an individual wants to build a structure within 50 feet of the vegetation line. A plan is also required whenever there is removal, relocation, or movement of sand dunes, construction of sand dunes or vegetation, movement or construction of sand fences or placement of fill in dune area. Dune walkovers, elevated walkways constructed above the dune area, are required for any new house constructed on a beach front lot in order to prevent damage to the dune area by reducing trail and road cuts. Each year the City of Galveston in cooperation with the Boy Scouts of America and many other volunteer groups, conducts a successful program entitled Trees for the Dunes. This project collects discarded trees during the first week of January which are staked on the beachfront to trap sand and encourage dune growth.

Galveston's Dune Improvement Plan and interest groups concerned with renourishment and preservation of the bay and its shores have been able to reverse some of the previous damage to the area. Although a tax initiative with proceeds to help beach preservation proposed by the Galveston County Beach and Shore Preservation Association failed, that organization along with the other environmental interest groups have put a positive pressure to perform on the GLO. Such local organizations are also responsible for researching innovative techniques which have assisted in preservation of the bay.

EVALUATION

Shoreline development threatens the environmental (and therefore, ultimately, the economic) health of Galveston Bay by disturbing habitat, increasing both point and nonpoint source water pollution, and increasing the likelihood of erosion. It also reduces public access to the shore, potentially harming tourism. Yet, except for coastal barrier islands and dunes whose disturbance might cause increased flooding, and the requirement for obtaining a permit from GLO and/or the Army Corps of Engineers, there is very little protection of coastal shoreline.

In the absence of much power for county governments in Texas, virtually all power to control shoreline development rests with incorporated cities. Yet in the bay area, few cities have zoning ordinances, and few of the existing ordinances contain any environmental protection provisions. In fact, cities desperate for economic development offer tax abatements on such environmental protection measures as sewer lines to companies that will locate within their boundaries. Legislation passed in 1991 gave coastal counties power to manage beaches in unincorporated areas.

The 1991 (Texas) Coastal Management Plan for State-Owned Wetlands Act provides a strong basis for controlling some kinds of shoreline development. Any project that affects state-owned wetlands (land up to mean high tide) must be consistent with the state coastal management plan, which is now being developed. Once the CZM program is in place, federal projects will also have to be consistent with the plan. While this will not affect projects on lands not owned by the state, it does offer the strongest protection available under the current (weak) regulatory framework.

Local governments must be educated about the adverse economic effects of shoreline development and about the hidden costs of tax abatements and related economic development measures. Although empirical economic evaluations of urban enterprise zones are mixed, several recent studies have shown that cities usually lose more in property taxes than they gain in other benefits of economic development and that the poor and unemployed are the biggest losers (Papke, 1990). The new requirements for stormwater and NPS management, the implications of which are not clear to most local officials, will further increase the costs of encouraging new development unless strong NPS controls are included in construction and operation permits. A sound economic study of these offsetting costs to the apparent benefits of new development could go a long way towards encouraging local governments to promote environmental protection along with other goals.

SUMMARY EVALUATION: SHORELINE DEVELOPMENT

1. **Problem.** Development on the shoreline contributes to shore erosion, loss of wetlands, increased point and nonpoint source pollution, reduced public access to beaches and shore.
2. **Authority.** General Land Office must permit activities on state-owned submerged lands; also see dredge and fill chapter for wetlands permits. Local zoning ordinances could include environmental considerations; however, many cities have no zoning ordinance and those that do have only neighborhood compatibility standards, not environmental. Counties have virtually no land use authorities.
3. **Capacity.** Low. Small cities have small or nonexistent planning staffs.
4. **Policy.** Promoting economic development more important than environmental protection. Environmental concerns not germane to small entities.
5. **Technical and environmental results.** Shoreline development continues.
6. **Barriers and problems.**
 - a. Tax abatements decrease tax base at the same time they increase demands on sewers and environmental regulation.
 - b. National Flood Insurance subsidizes premiums and thus encourages beach development.
 - c. Lack of county authority on land use; new coastal/dune powers still unfamiliar.
7. **Recommendations.**
 - a. Work with local officials to show the economic benefits of environmental protection.
 - b. Structure tax abatements and industrial parks so they have environmental requirements; for example, industrial parks can reduce NPS through joint holding ponds, etc.
 - c. Support proposed federal law reducing subsidies for coastal homes subject to flooding.
 - d. Legislate additional county authority for environmental planning and control in unincorporated areas.

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