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Beach Zone Use in Florida: Public Goods,
"Nonmarket Failure," and Property Rights

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Beach Zone Use in Florida: Public Goods,
"Nonmarket Failure," and Property Rights

The controversy concerning beach zone use in Florida was highlighted this year by the announcement of Governor Graham's "Save Our Coasts" program in which he emphasized the importance of Florida's coastal zone, its beach zone in particular, and the many problems that are facing this vital resource. The governor and other state officials are aware that many errors have been made in the past and that these errors are making planning decisions more critical with each passing day.

Some of the major errors in dealing with beach zone use have been: 1) The beach zone was not recognized as a resource supplying goods with a public nature; 2) Public expenditures in the beach zone were not appraised using a social efficiency perspective; 3) The beach zone was treated much the same as mainland real estate, disregarding the physical characteristics of the zone and the complex interface of public and private property rights that occur in the zone.

Almost all of Florida's beaches are located on barrier islands. The beach zone and barrier islands are very nearly the same in Florida and will be treated as such.

In his report on hazard mitigation, Sharma (p. 1450) described the dynamic nature of barrier islands: "These low-lying unconsolidated land forms are highly dynamic and vulnerable, constantly adjusting to sea level changes, ocean waves, tides, currents and winds." They protect the mainland from storm attack much the same as a large offshore bar protects the beach. They bear the brunt of storms by absorbing and dissipating the energy of storm waves and tides. In simple terms, the major difference

between an offshore bar and a barrier island is that a barrier island is large enough that vegetation will appear and hold the large unconsolidated land mass together. The other stabilizing factor working on barrier islands, besides vegetation, is the dune-beach sand cycle.

When a large storm strikes a barrier island beach, the beach and all or some portion of the dune is "scooped" out to sea by the combination of storm tides and wave action. As the suspended sand particles move into calmer waters seaward of the surf zone, they will settle out of the water column and form an offshore bar. The offshore bar will dissipate wave energy before it strikes the remaining shoreline and act as an automatic erosion stabilizer for the duration of the storm. After the storm is over, normal wave action moves the accumulated sand from the offshore bar and deposits it back on the beach. First the beach is rebuilt, then as the wind blows sand back into the remaining vegetation, the dunes are rebuilt.

It is the ability of the sand in the cycle to move that lessens the hazard to upland structures. If man's development of the island obstructs this natural cycle, the automatic stabilizing forces will not work, and sand lost to storms and natural erosion will not return to replenish the beach and dunes.

The resource allocation problem that state officials have described is a situation in which we are regressing from the boundaries of an imaginary production possibilities curve for the state's beach zone resources. Inefficiencies in resource use are resulting from the problems of erosion, dwindling public beach access, and hazard mitigation (though the latter is more of a cost problem) incurred by rapid and poorly

planned development.

The objective of this paper is to analyze some of the major issues that affect the zone, such as public goods characteristics, governmental roles and nonmarket failure (as defined by Wolf) and the interface of public and private property rights. It is hoped that this process will yield a clearer perspective of the situation and may suggest whether a Pareto-optimal, or at least a socially acceptable solution exists.

Conceptual Models

Three conceptual models provided a basis for analysis of the problem and deal with public goods, nonmarket failure, and property rights.

Public goods have three distinguishing features: 1) Usually it is difficult to exclude others from benefiting from the good supplied; 2) The opportunity cost of extending the benefits of the good to one more person is at, or near zero; and 3) The good will usually be under-supplied if left to the forces of the market because the benefits accruing to the owner are much less than the cost of production (Singer, p. 116-118).

Wolf's theory of nonmarket failure is appropriate in describing how the market forces governing the usage of the beach zone have been distorted. Basically, Wolf's work deals with aspects of the failure of public policy to improve upon the inadequacies of the market place, and in many cases may actually cause further distortion and inefficiency.

There are four types of nonmarket failure: 1) internalities and private goals (dealing mainly with the ways in which agencies evaluate themselves); 2) redundant and rising costs; 3) derived externalities (un-anticipated side-effects of public policy); and 4) distributional inequity (Wolf, p. 116-29).

The conceptual model of ownership and property rights is built around J. H. Dales' idea that "ownership consists of 1) a set of rights to use property in certain ways (and a set of negative rights or prohibitions that prevent its use in other ways); 2) a right to prevent others from exercising those rights, or to set the terms on which they may exercise them; and 3) a right to sell your property rights" (Dales, p. 59).

Analysis

The problems and issues at hand are not easily divided among the three models. But these concepts can aid in the process of untangling the resource allocation problem.

In their natural state, Florida's beaches provide two benefits with public goods natures: storm protection to the upland areas of the island, and various forms of beach recreation.

The fact that one land owner enjoys the benefits of a barrier beach's storm protection in no way diminishes the ability of another land owner from enjoying those benefits. Operating unrestricted, the dune-beach sand cycle excludes no one from its benefits and operates at a zero opportunity cost in extending its benefits to others. But as more of the state's beaches passed into a privately developed state, it was not recognized that there would be no economic incentive for individual owners to maintain the dune-beach sand cycle. There was, and is no mechanism to compensate land owners for the benefits received by others as "free-riders".

The "production costs" (in terms of lost development opportunity costs) were often much greater than the individual owner could recoup. Dunes were destroyed to enhance visibility or to increase the size of usable construction space. This was often done out of ignorance of the sand

cycle's importance, but was also done because the owner's individual valuation of the cycle was distorted by the availability of federally subsidized flood insurance.

The recreational benefits of the beach zone are also public goods. Exclusion from the landward side is technically feasible, but exclusion from along the shore and from the seaward side would not only be very expensive, but also illegal. Like Mt. Everest, the beach "is there," costs nothing to produce, and the opportunity cost to the state of extending its benefits to one more resident or tourist is zero.

The preservation of this public good is of extreme importance to the state. Florida has over 700 miles of fine sand beaches, more than any other state in the union (Sharma, p. 1453). It has been estimated that 86% of the tourists in Florida use its beaches, and tourist expenditures run into billions of dollars annually, constituting 27% of the state's income (Fla. Bureau of Econ. Stat.)

Unfortunately, in the absence of effective regulation or any incentive for the owner to maintain the beach in its natural state and provide public access, much of the storm protection and recreational benefits of the beach zone have been lost, or undersupplied by inefficient "de facto" allocation to private sector development.

Public action to preserve the benefits of the beach zone's resources has generally been piecemeal and it often appears that government agencies have worked at odds with each other. Despite the public nature of the resource and substantial evidence of the hazards of high density development, no comprehensive plan was ever formulated for the optimum efficient use of the beach zone. Public expenditures actually encouraged poor building location and density inefficient use (Shows, p. 9).

In 1980 there were 20 different federal agencies with 30 different programs affecting barrier islands, and most of these programs encouraged and subsidized development (Sharma, p. 1452). When providing grants for wastewater treatment and water supply projects, the Environmental Protection Agency required excess capacity for 20 years growth. The EPA makes no special consideration of the limited capacity for growth on barrier islands in its granting processes. The result is to encourage growth and possible over-development after completion of such projects (Sharma, p. 1458). The Federal Department of Transportation does not provide for differential treatment of barrier island projects either. Because of the high costs of developing barrier islands without federally subsidized bridges and roads, development of many islands would have occurred at a much slower pace, or not at all (Sharma, p. 1458).

During the last three fiscal years of the 1970's, federal agencies have collectively provided nearly \$500 million to barrier island development projects, not including disaster relief and insurance payments (Sharma, p. 1453). Although the amount was not broken down into recipient states, one can speculate that a large proportion of this money went to developing Florida's barrier islands, considering that of the 1.6 million acres of barrier islands in the U.S., 470,000 are located in Florida (Sharma, p. 1453). These subsidies, and the millions that came before them, were bound to have an effect on the allocation decisions of the private developers and municipal planners.

Perhaps the largest federal subsidy is the National Flood insurance program. Federal Insurance Administration figures show that "for every one dollar collected in insurance premiums on barrier islands, over

three dollars are paid out in losses" (Sharma, p. 1454).

A state sponsored study reported that, "Although a stated objective of the National Flood Insurance Act was to discourage development in flood prone areas, flood insurance may encourage such development by the insurance of lenders against loss from disasters...responses revealed an increased willingness upon the part of the lending institutions to consider ocean-front loans after federal flood insurance became available" (Smith, p. 34).

Statistics also show that some of the data used to formulate qualifying structural requirements are inadequate. Federal model storm predictions for Bay County showed 100 year flood damage to occur at up to 10 ft. above sea level. Hurricane Eloise (an intensity level 3 storm on a scale of 1 to 5) caused extensive damage to structures at 16 or more feet above sea level" (Shows, p. 15).

One peculiar stipulation for the owner's collection on damages is that the building be re-erected on the same property on which it was destroyed. Studies have shown that relocation costs to safer places are more than offset by the added benefits (Sharma, p. 1455). This stipulation demonstrates evidence of the nonmarket failure of bureaucracies to enact cost saving measures in order to secure the private goal of perpetual budget allocations and growth (Wolf, p. 119). In fact, flood insurance is now the second largest liability of the federal government, covering \$60 billion in policies (second only to Social Security) (Sharma, p. 1454).

The federal government also works to protect the development that it has encouraged and insured. Natural Resources Defense Council studies show that in fiscal year 1977, "the Corps of Engineers had \$272.8 million in 19 authorized erosion control, hurricane protection, and flood control projects

on barrier island beaches." Beach nourishment (the pumping of sand back on the beach) at the Miami Beach - Dade County project alone will cost \$63 million for 10.5 miles of beach (Sharma, p. 1457). As the beach zone becomes more developed, the need for costly erosion control and beach nourishment grows.

The recent passage of the federal Barrier Islands Bill reflects the concern of legislators over the "redundant and rising costs" of subsidizing the development of barrier islands and then insuring and protecting them from the unceasing natural forces that work on them. As of 1983, no federal monies will be spent on development grants or insurance on undeveloped barrier islands. Although this is a landmark piece of legislation, it will not affect partially developed islands, and the time delay in implementation may actually encourage a race to develop the presently undeveloped islands.

State and local governments have also encouraged development through their own programs and in cost sharing projects with the federal government. Initially, inefficient development might have been controlled at the local level, but the enactment and enforcement of sound planning policies have all too often been weak and timid. What may have caused this is that, in effect, the federal and state governments strengthened the bargaining power and position of development interests by making massive subsidies available and left local governments in a difficult position.

The state response to the problems of the beach zone has been the Beaches and Shores Preservation Act of 1965, which was later amended to include the controversial Coastal Construction Control Line (CCCL). Cost-benefit analyses of the CCCL have been performed for specific locations around the state and they disagree on the cost effectiveness of this type of regulation. One study, focusing on Martin County (Smith and Belloit), reported

that costs would outweigh benefits until the year 2027. One of the reasons for this may have been that the preservation of recreational beach benefits were counted as having no value. One of the justifications the author gives for the zero valuation is, "existing development patterns use very little land seaward of the line "(p. 31).

This conclusion can be questioned. Development patterns in Dade and Broward counties provide evidence that as construction space on the beach becomes more scarce, development will move closer and closer to the surf zone, reducing, and in some cases eliminating the area of the beach normally used for recreation.

Another of the author's justifications for the zero value is that public access through privately developed property constitutes trespass. In a very narrow sense this may be true, but this is a property right that the state may want to bargain for separately, especially in light of the enormous economic losses the state may suffer if the tourist trade is damaged by the increasing loss of public access due to development. We also must recognize that any erosion caused by unregulated development will not necessarily stop at the owner's property line, but may extend to the adjacent private and public beaches, diminishing their value for recreation.

A similar study focusing on Bay County shows positive benefits except in cases where the distance from the CCCL to the road was less than 100 ft. and the property could not be economically developed (p.9). In cases like this, we must ask ourselves, should the state pay for the owner's perceived economic losses due to the state's changing or "taking" of his property rights? A sense of fairness and economic efficiency would indicate a positive answer, but how much should the state be required to pay for these rights? Is the owner guaranteed a return on speculation? More difficult

yet, should the state pay the costs alone? Again we run into the problem of nonmarket failure. There are so many mixed signals caused by the unintended derived externalities of subsidies, and private goals of budget growth that affect the value of beach zone properties that a "fair" compensatory value would be hard to determine. If we pay what the owner feels is his full opportunity cost (which is what is asked of the state now) without taking into account the value that has been added to the owner's property in the form of massive public subsidization, then aren't we exacerbating what Wolf calls "distributional inequity" (Wolf, p. 131)?

Examples of nonmarket failure abound in the beach zone. The case for the application of Wolf's theory in this area is a compelling and interesting one.

Property rights (and beaches) are like anything else in life that really matters, the only thing you can be sure of is change. Public and private property rights concerning the use of the shoreline have changed over the ages from *res communes* (things open to common use) under Roman civil law, to *jus privatum* (all rights conveyed to private use) under Norman law in Britain, to *jus publicum* (public trust held for the benefit of the public even when title has been granted to individuals) as is the case today. As the values and needs (scarcities) of society change, so do the systems of property rights (Maloney et al., p. 854).

As we have become aware of the severe problems of erosion that can be caused by an owner changing the physical structure of his beach-front property, negative rights or prohibitions on what the owner may do with his property have become more acceptable. Most owners accept these property rights changes without claiming the need for compensation, perhaps because

they realize that without these changes, they may become the victim.

The real rub is that of the right to beach access. The problem lies in the fact that as the beach zone has become more developed, more owners are exercising the right to prevent others from exercising what, prior to development, was an uncontested right, public access to the public domain.

This is very important in Florida's case, because, although the CCCL may be cost-efficient and acceptable from the standpoint of storm damage protection and overall recreation benefits, there are no guaranteed rights to public access except in cases where owners implicitly (through their elected representatives) agree to beach nourishment projects, and then the access must be purchased by the local government involved. Informal conversations with Florida Department of Natural Resources officials and consultants indicate that sometimes there is local opposition to what owners feel is loss of their right of privacy under the joint nourishment projects, and that this feeling may endanger the future of nourishment projects. Without a resolution of this dilemma, neither group will be the "winner." The public will continue to lose access, and the property owners (through natural or storm erosion) will lose the property they wish to exclude the public from.

Conclusions

In a report before the House Committee on Interior and Insular Affairs in 1980, J.R. Schaeffer and L. Rozaklis presented the committee with the startling evidence that, "preliminary data show that fee simple acquisition of undeveloped barrier islands by the government for public recreation, conservation, and hazard mitigation is five times more economical than federally subsidized development" (Sharma, p. 1454). In the long run, this would probably be the best solution on undeveloped islands, primarily

because the need for flood insurance and frequent and costly beach nourishment projects would be eliminated. But in an era of tax revolts and federal reluctance to acquire new property, large land purchases may be socially and institutionally unacceptable.

The second-best solution for undeveloped islands is the newly enacted Barrier Islands Bill, because it will eliminate the most pervasive source of nonmarket failure, federal subsidies.

We are still faced with the problem of what to do on partially, and fully developed islands. The potential for public goods losses and high beach maintenance costs are still there, in spite of the provisions of the Beaches and Shores Preservation Act. It would be interesting to develop a market structure for the various rights involved. However, the determination of the prices for these rights, free from the influence of the existing derived externalities, would be a long and difficult task, one that may take longer than the state can afford to wait.

The most expedient solution may be for the Department of Natural Resources to be granted the power of eminent domain and condemn both the most hazardous sites, and those sites with the greatest possibilities for recreation. The state could then auction the properties after attaching restrictive sets of rights. Severe development restrictions could be attached to the hazardous sites and provisions for public access, or limitation of development to public accommodations could be attached to the sites that are best suited to recreational usage. A "shadow price" for the rights in question might be determined by calculating the differences between what the state pays for the properties and what they sell for after the restrictions are attached. The latter solution would also facilitate the goal of preserving public goods,

and extending their benefits to the maximum number of people.

None of these solutions are claimed to be perfect. Whatever decisions are made by the state, Pareto-optimality will be an elusive goal. Undoubtedly, some group will feel that it has suffered losses. But decisions must be made, and in the end, they will be political decisions. All that we can hope to do is analyze the problem and make suggestions to the best of our knowledge and ability.

It was erroneously reported on pages 8 and 12 that the Barrier Islands Bill had been passed by Congress. However, the Bill had only passed out of Committee.

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