
Entrepreneurship and Coastal Resource Management

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Many environmental problems along the coast are fundamentally no different from those in the interior parts of the country. Congestion, noise, and air and water pollution concern Dallas and Kansas City as much as they do Myrtle Beach or Miami. But beaches and estuaries are especially sensitive to economic development, and coastal areas of the United States are experiencing more rapid development than inland areas. The number of people living within fifty miles of the U.S. coastline rose from 61 million to 130 million between 1940 and 1988 (Long 1990, 6). More than 50 percent of Americans currently live within fifty miles of the shoreline, but the figure is projected to rise to 75 percent by 2010.¹ The number of nonresident tourists traveling to coastal areas has also grown substantially. Many, if not most, of our coastal environmental concerns stem from population growth pressure.

Poorly planned development in environmentally fragile coastal areas can cause shoreline erosion, polluted water, noisy and crowded surroundings, and extensive loss of trees, wetlands, fish and other wildlife. Population

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1. Economic activity in the coastal zone is important to the national economy. In 1985 the National Coastal Research Institute estimated that 31.7 percent of GNP originated in the 413 coastal counties (Morris 1992, 39).

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growth reduces land availability, encouraging developers to fill in marshes, destroying fish and animal habitats. The clearing of land destroys vegetation and trees, which increases runoff and ruins the overall natural beauty of the environment. Damage to streams, marshes, and marine life results from the use of pesticides, fertilizers, toxic chemicals, and other pollutants. Storm water runoff and effluent from sewage treatment facilities also cause trouble. The large amounts of nitrogen and phosphorous that pour daily into estuaries result in algae blooms that remove oxygen from the water, sometimes producing fish kills. Development also leads to the withdrawal of large amounts of water from aquifers, which causes salt infiltration and reduces water quality.

Shoreline erosion is a problem along much of the nation's coastline. The U.S. Army Corps of Engineers estimated in 1971 that 40 percent of the total shoreline of the lower forty-eight states was experiencing significant erosion (Morris 1992, 122). Wind and wave action associated with storms and high tides bring about natural erosion, but people effect much erosion, too. Damming rivers restricts the flow of eroded rock, which is the source of much of the sand on beaches. Destruction of sand dunes, sea oats, trees, and grasses removes natural protection, leaving the shore more vulnerable to ocean waves and currents, thus imperiling property and lives. Barrier islands, landforms that protect the mainland from the direct force of waves and storms, are especially susceptible to erosion. These dynamic islands are constantly eroding or accreting because of changing energy conditions (Leatherman 1988).

Erosion control techniques employing hard devices such as seawalls, groins, and jetties may actually accelerate beach loss rather than prevent it (Platt et al. 1992, 8). Another method of dealing with beach loss involves beach restoration via sand replenishment. This process, which trucks sand from inland pits or pumps sand from rivers or the ocean, is expensive and short-lived. Ocean City, Maryland, replaced nine miles of oceanfront sand at a cost of \$51.2 million, only to see the bulk of it wash away during heavy storms in the fall of 1992. Most of the renourishment sand from a 1993 project at Folly Beach, South Carolina, that cost \$12 million was washed away within two years ("Beach Programs" 1995). Similar stories abound.

Market Failure and Government Involvement in the Coastal Region

Many coastal resources exhibit characteristics of a common pool resource (CPR). This term refers to a resource for which exclusion of potential users is difficult and the use of which by one individual diminishes the amount available to others. When sufficient demand exists and access is not controlled,

the result is the classic "tragedy of the commons" (Hardin 1968). Ocean fisheries, which tend to be overfished because users have little incentive to conserve the resource, exemplify this problem. Marshes, estuaries, beaches, and barrier islands all have aspects of CPRs and suffer from what some call market failure.

As estuaries and marshes are owned in common, no one prevents runoff from roadways and developed areas from polluting these critical waters. As development has expanded in coastal areas, increased pollution has reduced the productivity of these valuable resources. In Hilton Head, South Carolina, the recent closure of oyster beds signals such problems. In fact, a third of the 600,000 acres of South Carolina coastline has severe restrictions on oyster harvesting due to pollution (Fretwell 1995, A18). Nationally, the percentage of shellfish beds closed due to pollution has increased from 20 percent in 1965 to 37 percent in 1990 (Stipp 1991, B1).

Sand is another example of a CPR. Wider beaches provide recreational and protection benefits for property owners on and near the ocean. Sand constantly moves, however, and property owners build jetties and other constructions to trap the sand for their own uses. These techniques can deny sand to other areas, reducing benefits for their owners. Numerous controversies have developed over who has the right to sand.

Environmental problems in coastal areas certainly cry out for solutions. The question is: What is the most efficient way to solve the problems? Various methods, including government regulation,² government ownership, market incentives, and privatization might be utilized in an attempt to correct the negative effects associated with CPRs.

Until 1960, the government did little to regulate development in coastal areas. For instance, Michael Danielson (1995, 238) reports that in the initial phases of the development of Sea Pines on Hilton Head Island, South Carolina, in the late 1950s and early 1960s, public regulation was minimal and government brought few pressures to bear on developers to behave in an ecologically responsible manner. However, public pressure on the government to become involved intensified in the late 1960s. The National Flood Insurance Act (NFIA), passed in 1968, was intended to promote wise development of flood-prone areas by encouraging floodplain ordinances designed to reduce future flood losses.³ Additional direction

2. The most common regulatory approach by government is the command-and-control, or standards, technique. Under the command-and-control approach, the government dictates the process to be followed or sets specific standards to be met. Alternatively, market incentives, such as taxes on undesirable activities, follow a carrot-and-stick approach to arrive at appropriate solutions.

3. With this act, governmental response also changed from engineering approaches, such as building concrete seawalls and rock revetments, to direct control of coastal development with various policy instruments (Platt 1994).

came from the Coastal Zone Management Act of 1972, which provided funding for coastal states to plan, evaluate, and control shoreline erosion.⁴ The Coastal Barrier Resources Act (CBRA) of 1982 (PL 97-348) provided a means of slowing development in the coastal zone by removing selected areas from government subsidized insurance and other financial assistance. The Coastal Barriers Improvement Act of 1990 (PL 101-591) further strengthened CBRA.

Also, state governments have initiated efforts to protect coastal areas through regulation and public ownership. In South Carolina, state regulation of coastal areas began with the Coastal Management Act of 1977. The state's regulatory powers were broadened by the 1988 Beachfront Management Act (SC 49-39-250) and revised again in 1990. Permits are now required before dredging or filling activities and dock, pier, and bridge construction can begin. Most other states with shorelines have enacted similar legislation.

Problems with the Government Approach

Recognizing market imperfections in the provision of environmental goods is one thing; improving matters through government regulation is another. A recent study of Oregon's coastal management program (Good 1994) finds that state policies designed to protect beaches are often ineffective. Although the state's policies give preference to hazard avoidance and non-structural means of erosion control, the methods generally used are seawalls and revetments, which can damage neighboring properties. The study suggests revising the state's laws as a means of solving the problems.

The government does not necessarily do a better job than the free market in the provision of environmental amenities. First, it is difficult and costly for the government to measure the benefits and costs of its actions. Second, government bureaucrats generally are not liable for their actions. Government decision-makers do not bear the full weight of the costs associated with their actions: costs are diffused, and cost shifting is rampant. Third, government managers do not and cannot know the value of trade-offs; that is, they cannot know the relative values that individuals place on nonmarket goods such as environmental quality versus other goods and services. Opinion surveys may help, but because respondents do not actually bear the cost associated with their answers, the results are questionable.⁵

4. Most states bordering oceans or the Great Lakes participate in this program. Since 1972, twenty-nine of thirty-five possible states have received funds.

5. It is especially difficult to estimate the value of nonmarket goods, such as environmental amenities. In addition to the contingent valuation approach, commonly used methods are the hedonic technique and the travel-cost approach. See Freeman (1993).

Fourth, special interest groups, such as real estate developers, environmentalists, and investors, always attempt to influence government decision-makers to see things their way. Often government policy winds up being compatible with the lobbyists' wishes.⁶ Finally, no competitive discipline exists in the government sector.

Unfortunately, in environmental matters government bureaucrats often make matters worse. For instance, government-subsidized flood insurance, provided by the 1968 NFIA, has been a significant stimulus to overbuilding in coastal areas (Miller 1975, 2). Government funded infrastructure subsidized or built by agencies such as the Environmental Protection Agency (EPA) and the Army Corps of Engineers entices developers and builders to become involved to a much greater degree than they would otherwise. For example, the EPA funds a large portion of the capital costs of public waste-water treatment works (Siffin 1981). Public roads, ramps, docks, and bridges produce overcrowding and heavy stress on the environment. Bridges financed by taxpayer dollars have been a key element in promoting the development of barrier islands. Such public works often become the catalyst for coastal development.

Government bureaucrats have an incentive to provide their constituents with what they want at little or no cost to them. According to the "State Beachfront Management Plan" produced by the South Carolina State Legislature, two of the Coastal Council's goals are to "improve public access" and "to develop new access sites" (South Carolina Beachfront Management Act 1990, 3). Charges to users are usually zero or nominal.⁷ Yet the coastal areas are already highly developed and crowded. For their efforts, bureaucrats get bigger budgets, staffs, and authority. They do not face the market discipline of competition; nor can they assess their programs by using the measuring rod of profitability.

Markets do have their faults. Market imperfections such as externalities distort efficient outcomes. Also, information can be inaccurate, monopoly power may exist, and social and private discount rates may differ. Yet, when property rights are established, the market tends to produce better outcomes than the government.

6. Terry Anderson and P. J. Hill (1994) explain how entrepreneurs, rather than "a few farsighted, unselfish, and idealistic men and women," were instrumental in the formation of Yellowstone National Park. The owners of the Northern Pacific Railroad, hoping to capture rents from tourists traveling to the Park, provided the major impetus behind the establishment of Yellowstone, the United States's first national park, in 1872.

7. With market-provided goods, anyone willing and able to pay the real cost for such amenities would have access.

Barrier Islands, Entrepreneurial Activity, and Environmental Goods

The absence of property rights gives rise to many of the environmental problems in coastal areas.⁸ When ownership rights are not defined, users have little or no incentive to take into account the effects of their actions on the welfare of others. Users rush ahead—the greatest returns going to those who get there first—using more and more of the resource as long as private benefits exceed private costs. Fish grow scarce, water becomes polluted, beaches are crowded and denuded, and wetlands and marshes disappear. However, overuse of environmental resources in the absence of government involvement is not inevitable. With a system of well-defined property rights, market incentives can produce gains in efficiency.

For example, in examining property regimes in southeast Asia, Jeffrey S. Walters (1994) finds that when proprietorship rights are placed in the hands of local marine resource users rather than of government officials, coral reefs and mangrove forests are actually better managed. In another example, W. A. Fischel (1994) finds that without government intervention, private developers provide efficient levels of open space. An argument in favor of zoning is that the proper mix of competing land uses will not result when development is left to private parties. Fischel, updating a study by T. O. Crone (1983), shows that in the absence of government controls, Foster City, California, a private development, provided a proper mix of apartments and single-family homes that maximized the value of land.

Coastal barrier islands present a good example of the privatization solution. In this case, private developers are ahead of legislators and government regulators. Developers can own entire islands; for all practical purposes they own and control much of the natural resource base, including beaches and marshes. Consequently, market incentives encourage developers to factor in environmental values. For instance, if developers can capture the “rents” from a wider beach, they would be willing to expend resources to protect beach areas. As Terry L. Anderson and Donald R. Leal (1993) explain, “the subdivider who puts covenants in deeds that preserve open space, improve views, and generally harmonize development with the environment establishes property rights to these values and captures the value in higher asset prices” (21).

Owners benefit by putting resources to their highest and best use, and suffer by putting resources to a less ideal use. Competitively determined prices reflect the wishes of thousands upon thousands of buyers and the

8. In his classic 1960 article, “The Problem of Social Cost,” Ronald Coase discusses how landowners can voluntarily solve externality problems when property rights are well defined and transaction costs are low.

circumstances faced by thousands of producers. Prices measure the net effect of offers by producers and consumers regarding property uses. The government resource manager, seldom having access to competitively determined prices, cannot assess the relative values of goods and services and therefore suffers a serious disadvantage in making decisions about the development of coastal areas.

People had few environmental concerns in much of the coastal zone until coastal development began to accelerate after World War II. Developments built on barrier islands such as Galveston, Texas, Atlantic City, New Jersey, and Miami Beach, Florida, were notable exceptions. In recent years, however, development has increased and concerns over deterioration of the coastal environment have mounted. Simultaneously, though, incentives have arisen for entrepreneurs to produce and market clean water and marshes, wide beaches, low population density, wildlife, and trees. As expressed by Joseph C. Bast and others (1994), "Rising efficiency and prosperity clearly have led to greater public concern for things that once were regarded as unimportant or unaffordable: clean air, clear water, and preservation of wilderness areas, among them" (198).

Figure 1 illustrates the response of developers to the changing market conditions in coastal areas. Increasing land values, resulting from growing demand for coastal property,⁹ coupled with rising consumer demand for environmental quality, provided the incentive for developers to protect coastal resources. The movement toward environmental protection, which continues today, sprang from improved scientific knowledge, higher standards of living, and entrepreneurial responses to buyers' demands. Evolving government regulation also has had some impact, but more often than not legislation lags behind market initiatives. Growing affluence and movement along an environmental "learning curve" are driving these markets, and improvements would be even more pronounced were it not for government programs that subsidize bad environmental decisions.¹⁰

A brief tour through South Carolina island developments such as Sea Pines, Seabrook, Dewees, and Kiawah clearly shows that recreational and residential users of resources have succeeded in outbidding alternative users. Charles Fraser, owner and developer of Sea Pines on Hilton Head Island, convinced his father, a logger who bought the land originally for its timber, to leave the tall pines along the coast, to capitalize on their greater value as a resort amenity (Danielson 1995). Environmentally conscious consumers

9. For example, on peak days 75,000 people populate Hilton Head Island, tripling the year-round population. Twenty-five years ago, 3,000 people resided on the island.

10. Building in coastal areas increased significantly as a result of the 1968 NFIA, which encouraged development by providing subsidized flood insurance.

have often outbid loggers because they place a higher value on the forests for recreational and residential use than do homebuilders.¹¹ In contrast, many public beaches, such as Myrtle Beach, show just the opposite outcome.

When coastal development began to accelerate a few decades ago, with very few exceptions little thought was given to the value of open space, harmony with nature, or the stabilization value of sand dunes and vegetation. There were few crowded areas and as a result few environmental concerns. Developers often built too close to the ocean; used "hard" erosion-control techniques, such as seawalls, rock revetments, and bulkheads; cut trees; and filled in marshes. However, over time, developers gained a better understanding of the coastal system and responded to the growing appreciation of and demand for environmental goods.

Another beneficial aspect of market-driven environmental decision making is that the provision of environmental goods pushes up the cost of coastal development, encouraging a movement away from the coastal zone as potential residents opt for cheaper land farther from the shore. On the coast, higher prices encourage efficiency, conservation, and ultimately long-term protection. Moreover, developers have incentives to discover and employ new technologies in environmental protection.

Developers also compete with one another to offer more and more environmental goods to their customers. According to Fred Foldvary (1994), "consumers reveal their demands for collective goods through a choice of community, and competition among communities ensures that local collective goods are provided at a minimum cost" (71).

Private Development on Barrier Islands: Specific Cases

Along the South Carolina coast, many private developments on barrier islands demonstrate the entrepreneurial process at work. Because the developers own most of the natural resources on the islands, they internalize the costs associated with decisions regarding resource use. They promote and

11. A recent case in South Carolina shows how private organizations can also protect valuable resources. A logging company applied to the South Carolina Coastal Council for a permit to construct a bridge to Sandy Island, not far from Myrtle Beach, in order to cut cypress trees (Paulsen 1995, 1A). Opposition arose immediately. Others preferred that the island's unique cultural history, along with wildlife, including the endangered red-cockaded woodpecker, be preserved, and suspected that the timber objective was only a ruse to develop the island. A political decision was made to deny the permit and a compromise solution led to purchase of the land by the Nature Conservancy, a private corporation that buys sensitive and natural areas for conservation purposes. The Nature Conservancy owns more than 1,300 nature preserves (Endicott 1993, 17).

market environmental amenities without the requirement of government oversight and usually with protection that exceeds minimum government standards. These developments have security gates that restrict entry to property owners and their guests. Deed covenants regulate and control building and future development to ensure environmental protection. The enforced agreements create security for property owners and, unlike governmental regulations, are not subject to changing political fashions. We consider four representative examples along the South Carolina coast.

The Sea Pines development covers 3,480 acres of beachfront, forests, lagoons, and sea marshes on the southern tip of Hilton Head Island. Parks, woodlands, golf courses, and tennis courts occupy 2,400 acres. Sea Pines illustrates the “learning curve.” Although Hilton Head Island had been bought for the Hilton Head Company by Fred Hack and Joseph Fraser in 1949 for its timber, Joseph’s son Charles saw the island’s resort potential. He began the island’s resort development phase in 1957 and became a pioneer in producing and marketing environmental goods.

The developer used natural materials in construction; laid out lots for excellent views; opened houses to the outside; protected trees, wildlife, and natural vegetation; and wound roads through nicely landscaped properties. According to Michael N. Danielson (1995), “Sea Pines became a training ground for developers, architects, landscape designers, and others who later took their lessons to resorts and new communities across the nation” (34). Fraser introduced strict deed covenants regulating both the developer and individual property owners, which have proven durable and enforceable. In 1985 a court agreed that the covenants legally bind the property owners (Danielson 1995, 287).

Seabrook Island is a beach-ridge barrier island twenty-three miles south of Charleston, South Carolina, and directly south of Kiawah, a sister barrier island. It contains approximately 2,200 acres of land, 3.5 miles of private beach, and it is bordered by three river systems: the North Edisto, the Bohicket, and the Kiawah. Until 1970, the island was undeveloped and used primarily by the Episcopal Diocese of South Carolina as a camp and conference center. The Seabrook Development Corporation, a private company, acquired the land in 1970 and commenced development. Seabrook now has about 2,350 privately owned properties, consisting of 495 single-family homes, 1,003 villas, and 852 undeveloped lots.

Most lots on Seabrook are heavily wooded and attractively spaced along winding streets. Houses are constructed with as little disruption as possible to natural vegetation. The island has a variety of freshwater lakes; numerous marshes, lagoons, and creeks; and abundant wildlife. It has a noncommercial atmosphere and forests of live oaks, pines, palms, and magnolias. Traditional commercial establishments such as grocery stores, banks, service stations,

and department stores, as well as churches and schools, are located outside the entrance gates.

Kiawah Island, next to Seabrook Island, is a 10,000-acre barrier island with ten miles of beachfront. Until the early 1900s, it was devoted to indigo and cotton production. In 1952, C. C. Royal of Aiken bought the island for its timber. In 1974 it passed to a buyer with plans to develop it as a resort. With the aid of Charles Fraser and the Sea Pines Company, a plan was devised to develop the island while preserving its natural beauty. Deer, fox, bobcat, waterfowl, and loggerhead turtles still inhabit the island.

Kiawah's gatehouse limits public access. The Kiawah developers spent \$1.3 million on a sixteen-month environmental survey before development commenced to determine how to minimize the adverse effects of development on the ecosystem. Ecologists, archaeologists, biologists, historians, land planners, architects, and other scientists and professionals joined in drawing up the Master Land Use Plan. After observing Seabrook's problems with beach erosion, the Kiawah developers also increased housing setback requirements.

Dewees Island is a privately owned barrier island twelve miles northeast of Charleston, South Carolina. Presently being developed by Island Preservation Partnership, the island has 1,206 acres well endowed with trees, water, marshes, and wildlife. To hold down population density and preserve natural habitat, the developer has allowed only 137 single-family houses, occupying 35 percent of the island. Homesites are placed at a greater distance from the beach than required by state guidelines. No wetlands will be destroyed in development of the island, and 350 acres will serve as a permanent wildlife preserve. No commercial facilities are planned for the island, and ferry service provides the only access to it. Only golf carts or electric-powered cars may drive on the island. All roads have a natural sand base, and concrete driveways and walkways are prohibited in order to reduce water runoff. Fencing; inorganic fertilizers and pesticides; and manicured lawns, hedges, and shrubs are disallowed.

Although we consider only a few examples here, many similar cases exist along the South Carolina coastline. Most are being developed with environmental concerns in the forefront. Resort developments near the non-barrier-island coast are also following this path. We have identified more than thirty such developments on or near South Carolina barrier islands.¹²

12. These developments include Bray's Island, Spring Island, Jeremy Cay, Sun City Hilton Head, Rose Hill Plantation, New Point, Fripp Island, Dataw Island, Callawassie, Daniels Island, Dunes West, Wild Dunes Resort, Sea Pines, Ocean Side Village, Fairfield Ocean Ridge, Ocean Creek, Kingston Plantation, Debordieu, Wachesaw Plantation, Wexford Plantation, Tide Pointe, Shipyard Plantation, Seabrook of Hilton Head, Palmetto Hall Planation, Palmetto Dunes, Moss Creek Plantation, Melrose Club, Long Cove Club, Hilton Head Plantation, and Haig Point.

Another advantage of privately owned developments is that they internalize the costs of maintaining beaches. For barrier islands that provide no public access, such as Seabrook and Dewees, federal and state funds are not available for beach restoration, and property owners must pay all costs.¹³ In Myrtle Beach, South Carolina, on the other hand, where beaches are public, federal and state taxpayers pay a significant portion of beach protection costs. The federal government is financing 65 percent of a current multi-million-dollar beach nourishment project at Myrtle Beach, with the state and local governments covering the remainder. Public beaches contribute to state tourism income and provide recreational benefits for the public, justifying some governmental financing. However, much of the recreational and protection benefit of beach nourishment accrues to property owners on or near the beach.¹⁴

Factors Affecting the Success of Privatization Solutions

Sea Pines, Dewees, Kiawah, and Seabrook Islands illustrate the evolution of barrier island development. Sea Pines, begun nearly forty years ago, was one of the first developments to market environmental amenities; Dewees represents a more recent trend toward higher environmental standards. Charles Fraser set the tone for this type of environmental marketing on Hilton Head Island in the 1960s. Because Fraser and his partner, Fred Hack, disagreed over the development plan for the island, they divided it and each followed his own path. Hack followed the traditional path of strip development, selling one lot at a time without an overall plan. Fraser, in contrast, thought in terms of the community as a whole, including protection of the coastal ecosystem. Fraser's environmental approach was so financially successful that his ex-partner decided to emulate Fraser and his Sea Pines development (Danielson 1995). Most island developments since that time, especially along the southeastern coast, have copied the Fraser model.

Many interior developments in the United States are also following

13. Seabrook Island has spent over \$3 million on seawalls and revetments (mostly by a few individual property owners) and about \$2.5 million on beach nourishment. A project to relocate Captain Sam's Inlet, in an attempt to reduce sand loss, was recently completed at a cost of some \$600,000.

14. By examining the monetary connection between beach width and property values, with a hedonic model, Pompe and Rinehart (1994) find that for every additional foot of beach width, \$525 is added to property values for oceanfront homes and \$234 for properties one-third mile from the beach. These calculations use the mean values of housing for location on the oceanfront (a sale price of \$170,430 and a square footage of 2,450) and one-third mile from the beach (a sale price of \$75,000 and 1,932 square feet). Clearly, there is a monetary payoff for beach protection and restoration.

such a course. Eagle Rock Reserve in Montana, Farmview in Pennsylvania, and Preserve at Hunters Lake in Wisconsin are notable examples of developers' recognizing and capitalizing on the demand for environmental quality (Fakis 1995). Across the country, thousands of such developments are built on lakes, rivers, and mountains with standards that run the gamut from minimal environmental to strict Dewees-type.

By not building as close to the ocean as possible and by protecting shoreline vegetation, property values for the community are enhanced. Although developers find protecting such environmental resources costly, they will voluntarily engage in such activity when they expect to receive private net gains. If property buyers value environmental protection and the developer can capture higher rents, a private developer will protect the environment without government coercion. Our research indicates that private developers are providing environmental amenities beyond the requirements of government regulations. Certain conditions must prevail, however, for such results to occur.

The first condition is that movement toward privatization of barrier islands is closely related to changes in land values. As the value of a CPR rises, precision in the definition of property rights becomes more valuable. The enhanced resource value attracts additional claimants, increasing the potential losses from the CPR as well as the potential returns from better-defined property rights (Libecap 1986, 231). For example, the discovery of rich gold and silver deposits in the American West after 1848 led to negotiation of property rights on previously unclaimed land (Umbeck 1977). Similarly, privatization of coastal barrier islands followed increasing land values, which were driven by growing demand for coastal property. Private developments became more viable because poorly defined property rights meant lower rates of return for developers.

Second, successful developments consist of tracts of land large enough to allow effective control over conditions affecting environmental quality. Small-scale developers have less incentive to provide environmental amenities because of transaction costs and the limited ability to gain from appreciation in land values due to enhanced environmental standards. Small developers bear the costs of environmental protection but the benefits spill over onto adjoining properties. Avoiding piecemeal development, large-scale developers will supply environmental amenities, expecting to capture the benefits through higher land values.¹⁵ The private developer has an incentive to use resources to determine how best to develop the area while

15. Capital markets that permit large-scale financing are important. A lack of capital or financing might have contributed to piecemeal development in the early years of barrier-island development.

minimizing the negative effect on the natural resource base. With many small parcels of land, the free rider problem and the higher costs of controlling externalities through negotiation discourage environmental planning.

Third, the private solution will be more successful where the boundaries of the development are clearly defined and access is more easily controlled. Under these conditions, property owners enjoy the benefits of the CPR and can exclude others. Furthermore, property owners can protect the development from adjacent incompatible uses. Geographical characteristics that limit encroachment, such as a mountain range (Dennen 1976), can substantially reduce costs of exclusion. Dewees Island has the advantage of being an island without a bridge; Seabrook has a single access gate. Although a barrier island has an obvious advantage, interior developments can create similar conditions by using natural barriers such as water and mountains, and manmade barriers such as fences and buffer zones. Because developments such as Sea Pines, Dewees, Seabrook, and Kiawah are self-contained and controlled by a single entity, it is more likely that the developer will capture the benefits of increased land values. The more difficult and costly exclusion becomes and the lower the benefits of exclusion, the less successful private solutions are.

Fourth, environmental goods flow more naturally from privatization when the costs of contracting and enforcing collective decisions are low. For the coastal communities examined here, such costs are minimal because new property owners buying into the community have tastes similar to those of residents already there; hence, a general consensus on how to order the development is more easily reached. Contracting costs are also reduced if restrictive covenants are already in place.

Fifth, privatization works better if buyers are well informed about environmental amenities and quality. Some of the attributes of environmental protection may not be immediately visible to potential buyers, and therefore developers must "spell out" the positive aspects of the development. An examination of the sales pamphlets from developments of this type confirms that developers take pains to inform potential buyers of the environmental amenities available.

Sixth, success is inversely related to the number of property owners, as the costs of contracting and enforcing regulations vary directly with the number of property owners. Most barrier-island communities place limits on the number of members. Barrier islands are not large, and their residents prefer low-density housing.

Although no island can be developed without some negative environmental impacts, islands such as those described here stand in sharp contrast to earlier beach developments such as Myrtle Beach, where trees are cut,

land rearranged, and plants and animals removed. But if development is to occur, the market approach can produce environmental amenities without the coercive force of government.¹⁶

Conclusion

Private developers are making significant efforts to protect environmental resources that add to the net collective value of the community. These efforts are simply profit-maximizing behavior by developers responding to property owners' growing demands to protect the environment and preserve the natural landscape. Large-scale developers are more likely than small-scale developers to protect common pool resources because the larger developers are better able to capture the benefits of their actions. This difference is especially evident in coastal areas.

But even in coastal areas, private development cannot solve all environmental problems. For some common property resources, such as fisheries, where access is not controlled and property rights are not well defined, environmental problems continue. Moreover, property rights do not extend beyond the island's environment.¹⁷ For example, upstream dams deprive coastal beaches of sand, and pollution runoff from farm and urban developments damages coastal estuaries. Furthermore, developers do not operate without making mistakes, and in some cases they actually ignore environmental concerns—for instance, it seems clear in hindsight that some buildings were constructed too close to the ocean on Seabrook Island. Utopias rarely, if ever, exist. We can only choose the course of action that promises the best feasible outcome. For coastal development, the market demonstrates significant compatibility between entrepreneurial activity and environmental concern.

Studies of cases such as Sea Pines, Seabrook, Kiawah, and Dewees are useful in determining how successful this approach may be in the long term. For a community of property owners with similar tastes and a strong system of protective covenants, our research suggests that the potential for long-term and widespread success is substantial.

Human beings have a desire for environmental goods such as scenic views, clear skies, clean water, space, and a feeling of harmony with nature.

16. Private solutions may become more valuable, as government regulation is incurring more cost for "takings." The David Lucas case, in which a property owner was awarded \$1.5 million when government land-use controls deprived him of the economic value of his two oceanfront lots, is representative of increasing challenges to governmental regulation (Rinehart and Pompe 1995).

17. One might expect to see more and more cooperation between developers in protecting common property such as estuaries or rivers that are shared.

Community developers, such as those on barrier islands, package environmental amenities along with other attractions and receive compensation from property prices in exactly the same way that Wal-Mart profits by selling tennis rackets, golf clubs, electronic equipment, and clothing. This process is under way in many other areas of the country. As consumer affluence and environmental knowledge grow, this movement will accelerate.

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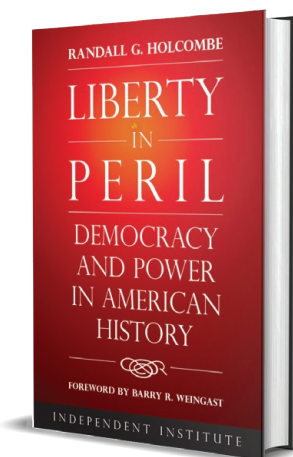
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