

# Improving Coastal Resource Management

## *A Strategy to Integrate Impacts*

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### **ABSTRACT**

*Coastal resource management strategies sometimes fail when they do not integrate development impacts into the existing ad hoc approach to coastal management. This paper outlines a set of strategies coastal developers may take when confronted by the need for change. Because a development and its coastal impact area constitute a connected system, the promotive strategy sees the development-impact area as interdependent. Such a strategy can turn impacts into an expansion of developer concern by promoting coastal impacts as a new pathway to greater coastal conservation and management opportunities.*

**Key Words:** Coastal Development, Coastal Impact, Linkages, Resource Management.

The concept of coastal resource management means many things to different parties involved in activities that impact on the coast. Developers defend additional structures on the coast as improving coastal management, among other things. Existing residents see such structures as a loss in management capability and, in turn, call for greater preservation of the coastline as sound management. Engineers focus on means to protect coastlines from erosion. Biologists and other scientists find the coast a natural laboratory for their work and often become frustrated over developer and engineering solutions to coastal management. They instead prefer a natural unmanaged coast. Regulators are interested in the continuing integrity of their administrative systems as a basis for manage-

ment. Recreationists, depending upon their preferences, may or may not desire greater coastal management. Consultants foster coastal plans and other means to serve client interests which may include any of the above. In other words, coastal resource management is an open-ended concept depending on who is defining it.

None of these groups is in a good position to manage coastal resources alone, much less to expand their role to include coastal impacts perceived by the others. Indeed, coastal impacts as seen by each party noted above can lead to losses in coastal opportunities for others. This set of conflicts gives rise to various coastal resource management strategies which, if not integrated, can lead to failure as well as disrupting coastal processes. While money can

buy a section of coastline, it cannot protect that portion of coast from unwanted impacts. Coastal resource management based on fully integrating the participation of all interests involved is a concept whose time has come. Just as the coast is an interdependent set of physical and biological processes, the set of users and their impacts combine as an interdependent unit in any coastal context.

One group stands out from the others in terms of generating major impacts on the coast and the subsequent shift in coastal opportunities for others—the developer. The developer can change the coast to such an extent that few would recognize its former character. For example, the development of Marcos Island in southwestern Florida cannot be reconciled with its former mangroves which pushed the land toward the sea. The loss of the dynamic character of that shoreline has placed residents there at risk, and allowed the sea greater access to the Everglades. When confronted with this type of impact, coastal managers frequently call for new legislation. However, another approach would be to pursue a strategy that provides incentives for developers to integrate their impacts into their decision-making process. What is needed is a concept that promotes coastal resource management via developers.

A new concept passes through more than one stage before it is accepted by decision-makers. This paper suggests that natural and man-made forces impacting on the coast can generate the basis for a new management approach that can be resisted, ignored, downplayed or accepted by coastal developers. To guide developers (and others) in making changes within their jurisdiction to correspond with their impacts elsewhere along the coast, an increasingly open set of strategies is required. The objective of developers forms their dominant strategy for guiding responses to specific coastal impacts. This paper defines and classifies a set of management strategies to coastal impacts from coastal development. As such, this paper is directed particularly to coastal developers.

The concern for development responses to coastal dynamics is not new. For example, Jolliffe (1983) focuses on five different coastal development strategies that can be employed to alter erosional situations as developers challenge the coastal environment. Another view is represented by Pilkey (1981, 1983), who discourages coastal development in many instances, especially on barrier islands.

Normann (1977) has developed a business growth model that contains three elements: a firm's system of dominating ideas, a firm's organizational structure, and a firm's external situation. Each of these three spheres should interact to produce an overall consonance that will generate a favorable development situation for that firm. This model can be applied to coastal resource management.

Objectives such as profit maximization are essential to the success of a developer. They are necessary for guiding the developer toward sensing a need to be filled, developing a product for the need, penetrating or creating its market, and extending that market share. This objective in turn must be linked to an organizational structure that facilitates this process through the necessary practical arrangements to support the firm in its external situation. Over time this objective about the product and its market situation becomes the *raison d'être* for the developer, e. g., it becomes integrated fully throughout the organizational structure as the firm's dominating idea. Thus, the firm's objective, its market situation and its organizational structure are all necessary elements in defining and maintaining a development strategy. Matching these three elements over time becomes the major management concern for the firm.

When a demand for change in the developer's product due to adverse impacts occurs, there is a built-in resistance to the implications this situation might have for the developer. The developer can either change the development without shifting its objective or reorient its objective to encompass more far-reaching development changes. The former is simpler than the latter.

Changing social attitudes and environmental knowledge are not linked directly to a coastal developer. His coastal development impacts can surprise the developer when other coastal groups rise in response to such impacts and seek to codify their interests against him. Accelerated erosion and pollution which may be caused by only one coastal developer can spark a movement against them all. Thus, the developer must respond in some way to his own coastal impacts, or he might find his coastal opportunities severely restricted.

## THE DEVELOPMENT PRESSURES

As coastal developers look to their futures, they are faced with having to reconcile a basic conflict: the need to balance development markets with their associated impacts on the coast. The firm's coastal situation can be divided into two components: the development domain and the impact area. Together the two comprise the firm's total coastal operating environment. Matching this expanded area with the firm's objective and organizational structure provides the basis for approaching coastal resource management.

The development and associated activities generate a set of coastal impacts that occur from the construction, existence, operation, maintenance, and use of the development. These forces impact directly on the objectives of others such as regulators and citizens' groups. These groups seek to manage the coastal zone by limiting developers. These limits are created, in part, from impacts associated with the development and its use, whether the impacts are real or perceived. These groups are bound together even though they usually belong to different organizations. They are linked by being motivated through a set of common objectives, particularly coastal resource management. This set of ideas inherent in coastal resource management allows communication among organizations and is the basis of forming their strategies to limit the developer. Thus, the coastal pressures faced by a developer may come from a wide spectrum of individual organizations including regulators, research

institutes, legislators, courts, citizens groups, lobbies, etc. In total they exert a set of political pressures on the firm to meet their joint demands. Examples of demands include seawall and groin placement, pollution control, advertising taste, beach nourishment, public participation, zoning, set backs, etc.

The demand pressures for recognition apply to the developer because of his existence as a coastal entity as well as his existence as a developer. In this way political pressures introduce another set of costs and benefits for developers such as pollution control compliance or relief therefrom. These pressures can cause the development to be eliminated, replaced, reduced, held at a fixed level, or continued at a higher cost to the developer. Any of these political pressures at some point would force the developer to respond in order to secure his coastal position.

## A TYPOLOGY

The responses of coastal developers to a call for limiting their development activity suggest the construction of a typology. Table 1 outlines the strategies which can be taken by developers answering the demands generated by coastal managers and other affected parties. Four types of strategy can be distinguished: preemptive, prescriptive, preventive, and promotive.

The *preemptive* type refers to a strategy where the developer attempts to retain control of his coastal development position, regardless of its impacts and demands for change by those affected. Because the developer's resources are oriented to coastal development, no attempt is made to secure knowledge of the impact area, and it is preempted. Rather, the objective is to maintain and enhance coastal development without considering its corresponding impact area. The preemptive developer employs approaches that center on avoiding change by ignoring, containing or repelling demands for change. This view relies on avoidance as the least-cost approach. Whether the developer acts directly to thwart others, or uses an intermediary to seek to protect its domain of operation, is not important here.

The *prescriptive* strategy occurs only in certain high-impact situations. Knowledge of the impact area is limited to ad hoc, one-time efforts to learn of certain repeated impacts for a particular type of development. Here the objective is to prescribe ways to change coastal development to the minimum required or necessary to avert demands for future limits. The focus is on minimizing costs in the short run through discrete actions aimed at constraining demands for change. Such may involve ad hoc contact with affected parties, one-time studies, or shifts in impacts.

The *preventive* strategy is meant to show that the developer is willing to change his coastal development in order to reduce its impacts where practicable. An effort is made to accumulate some knowledge about the impact area to support the objective of preventing coastal development impacts where applicable. This approach consists of minimizing costs in the long run by preventing impacts at the source as well as treating those that cannot be prevented. Monitoring of impacts can also be done.

A process to allow affected parties to convey their demands can be provided. Development technologies could be changed under this response type.

The *promotive* strategy refers to a dynamic interaction between the coastal development and impact area, where these two environments are considered as one in all situations. Active promotion of information, about the coastal impact area and processes, rivals the research base of development information. Such knowledge is necessary to meet the objective of promoting the total coastal area whereby impacts may be viewed initially as potential "profit" sources. Thus, affected parties previously opposing coastal development could become supporters. In this case the developer encourages changes in all aspects of the development and technology to account for promoting the total coastal environment. The impact area is enhanced where possible, and those affected are regularly monitored or surveyed in order to elicit ideas for such enhancement. Shared decision-making for the coastal impact area may also be considered. The original development objective may be wholly transformed.

**TABLE 1**  
Stages of Dominating Ideas on Accepting and Integrating Coastal Impacts

I. Preemptive	II. Prescriptive	III. Preventive	IV. Promotive
Traditional responses dominate in all situations (avoid change)	Traditional responses dominate but reduced in high threat situations (least change after the fact)	Traditional responses constrained through threat considerations in all situations (practicable change before the fact)	Traditional and threat responses formed together in all situations (total interactive change)
<i>objective:</i> nonacceptance of threats no service change avoid all new costs	<i>objective:</i> minimal acceptance of threats minimize service change minimize short run costs avoid long run costs	<i>objective:</i> acceptance and integration of threats minimize threats but retain service minimize total costs	<i>objective:</i> integration and promotion of threats maximize service-threat system maximize "profit"
<i>strategies:</i> ignore threat demands contain threat demands repel threat demands no contact with sources	<i>strategies:</i> symbolic change one-shot change in threats ad hoc change in threats constrain threat demands ad hoc contact with sources	<i>strategies:</i> monitor threats treat threat impacts prevent threats where can channel to sources	<i>strategies:</i> service-threat trade offs enhance threatened areas, even outside invite threat demands monitor sources

## THE PROMOTIVE STAGE

An important question is why not stop with the preventive strategy. It is unreasonable to think of coastal development as functioning in the absence of its impact environment, whether in the immediate area or down drift since the coast is an indivisible system. Because coastal development and its impact area together constitute a connected system, the total coastline is a series of development-impact interactions capable of being managed. The exclusive focus on coastal development that now serves as the basis for inquiry into coastal impacts has served to increase an understanding of coastal impact, but it biases the inquiry into the impact area. Development and impact are usually set apart as mutually exclusive (as are health and disease). Coastal resource management will see them together as mutually interdependent aspects of a situation: there is an environmentally integrated way to develop a coastline. This strategy is difficult because of the standard negative definitions of impacts. To advance to the promotive type of idea is to design and construct a paradigm for coastal development using its impacts as part of its definition. Here the impact can be the basis for a wider and more integrated coastal resource management strategy. A key point is that the developer promotes the total coastline by acting as a coastal manager.

Another important question is why the promotive stage is not prevalent and pursued as normal practice. The basic answer is that past development success with a previous objective retards the introduction of a competing objective, even if the newer one could more readily support the existing one. Several reasons may be put forward for this stance: Small changes to a development are often sufficient to account for a pressure in the short run; money has been spent to establish the existing way of doing things; the developer's original objective has filtered into middle management to generate organizational rigidity; the information sources of top managers are often dominated by those without coastal experience; a hierarchical organizational structure retards experimentation; performance reports rarely include infor-

mation on development impacts; changes in the coastal development market lead to an emphasis on profits in the short run; incremental decision-making is viewed as basic to dealing with unfamiliar pressures from coastal managers; searching for new information is often unfocused through lack of knowledge of the sources of data from coastal researchers; finally, as noted in the previous paragraph, integrated thinking is not a common mode of approaching political pressures created by coastal scientists and environmentalists.

## HURRICANE IMPACT

Hurricane impact management stems from a developer's need to sense the probable impact of a major storm or hurricane, and to adapt to meet these expected yet unpredictable events. The suggested typology can be seen as one way to classify the stages inherent in hurricane impact management.

The preemptive stage rests on the premise of ignoring hurricanes or implicitly hoping for minimal impacts when they occur. This is a non-management stance. The developer's response is based on the inherent belief that it can cope with a hurricane if it occurs.

The prescriptive stage recognizes the existence of hurricanes but would not maintain a capability for meeting them. Instead, this response is based on responding to a hurricane after it occurs.

The preventive stage generates a capability for monitoring its expected impact environment in order to detect possible surprises. This effort is based on beginning to manage a hurricane's impacts just before or when they occur.

The promotive stage is the creative use of the hurricane threat, both to alter the magnitude of its impacts on coastal development, and to alter the development itself if necessary. This stance is based on developing the capability to reach out and assume a hurricane before it "naturally" occurs.

Coastal development advertisements suggest a lack of understanding by developers to hurricane threat. For example, photographs showing the nearness of the development to the

shoreline, the narrowness of the fronting beach, and the kinds and designs of developments nearest to the beach, all demonstrate a lack of hurricane preparation and management for its impacts. Comprehensive, adaptive and creative management approaches are important (Holling 1978).

## THE LINKAGES

What are the links necessary to integrate coastal impacts with coastal development? The preemptive strategy attempts to resist any link between development and its impacts by ignoring or repelling attempts to do so. Here development feasibility and promotion do not include a role for impact management. In the prescriptive type of response, the attempts are toward short-term efforts to reduce coastal impacts. This response may include the hiring of outside impact experts. The preventive strategy is oriented to a continuing effort to reduce the impact and generate ad hoc information to the developer. Coastal experts are hired by the developer, and they maintain ties to development experts, other experts, and those affected. The promotive strategy includes the developer who is redirecting himself to the total coastal environment. All aspects of the impacted coast are considered by the developer and contribute to the developer's objective. This consideration includes impact experts at each stage of the developer's production process where the development(s) are redesigned and oriented to eliminate or minimize coastal impacts. Even the immediate coastal location could be given up. Direct and continuous links are maintained with impacts and those affected just as is done for "traditional" developments and customers.

Including the coastal impact area as part of the developer's objective function may possibly lead to new profit sources. The preemptive approach only attempts to maintain its present development profit, regardless of the pressures faced. The prescriptive approach only embraces immediate impacts on profits when forced to do so by a high level of demand from

those affected. The preventive approach seeks to integrate certain impacts as part of its profit interest but they are few and ad hoc. The promotive stance is comprehensive in that it includes the full set of physical and social influences operating in its impact area through being linked to the organizations concerned with coastal issues and development impacts. Coastal resource management can then be the market rather than a development on the coast. Thus, those who attempted to thwart the development could become the purchasers or employees of the developer.

This "market" expansion toward impacts is similar to a firm responding in a promotive way toward its products by being linked to the motivating factors influencing the scope of its market. Such links in its product domain would include marketing experts with direct links to potential customers. The payoff for the firm is not only the protection of its product market but the possibility of turning pending impacts into product ideas for profits, including such non-market profits as coastal privileges and subsidies, and thereby truly expanding its scope.

## IMPLEMENTATION

How the strategy of integrating coastal impacts can be embedded into the thinking of developers is important. Two items are relevant here: the internal thinking process itself and the external issue selection process. Incremental decision-making is often seen as a "norm" when facing uncertainty. "Incrementalists" argue that by thinking small and moving incrementally they can muddle through a problem (Goodin and Waldner 1979). While the preemptive approach is a matter of ignoring or repelling demands for change, the prescriptive and preventive stages fall into the incremental category where change is met with forward-going steps, as perceived necessary. Promotive thinking, however, is characterized by an investment in becoming a coastal manager. This kind of manager takes in the total development-impact environment and relies on signals from coastal experts and the organizations concerned

with impacts for making whatever changes may be appropriate.

The greater the implicit consensus among developers, the greater the uncertainty others have over coastal development impacts. Countering this uncertainty with an open and integrated questioning process among affected parties is important, because the more fundamental the objective or issue, the less the willingness to engage in self-examination. Promotive thinking involves confronting the developer's dominating objective with their coastal impacts in order to fashion integrated objectives based on a more explicit understanding of coastal impacts. Incentives for making these radical changes in coastal development are paramount for eliciting promotive thinking.

However, even within this more comprehensive approach, a limited set of impacts will have to be selected for detailed study. Selection criteria could include the number of people affected, the physical nature of the impact, its economic implications, and its political setting (Wiseman 1978). A growing level of resource commitment to study an impact implies an increasing need for action, since the effort may preempt opportunities for using the same resources for other impacts. The large number of connections between coastal impacts requires a growing need to analyze how such complexity will affect each party. The implications of the impact study affect the need to innovate, invest resources, identify irreversibilities, and determine the significance of the outcome for all coastal groups. In particular, the political setting involves the level of urgency, degree of advocacy, and consistency among the affected parties. These factors can aid the promotive developer in his selection of coastal impact issues for creating the appropriate responses.

This promotive approach brings the developer into a new arena, that of becoming a coastal resource manager. As such, it puts him in a partnership with other coastal resource organizations toward integrated management and conservation of coastal resources.

## SUMMARY AND RECOMMENDATIONS

A typology classifying four types of developer response to coastal impacts was presented: preemptive, prescriptive, preventive, and promotive. This typology is based on a gradual acceptance of coastal impacts and a reorientation of the developer's dominating objectives. The primary goal has been to classify his responses to the entire coastal zone so that a coastal resource management stance can be integrated into development decision-making.

The strategy for integrating impacts into the developer's objective is important for reducing the risk associated with rising impacts on the coastal resource as well as the risk of future political and legal limits. Planning efforts by developers should be directed toward their coastal development's impact area in order to integrate it and all affected. Research efforts in universities and elsewhere could concentrate on studying developer behavior toward increased impact knowledge by conducting case studies of coastal development decision-making. Such efforts would lead to a refining of this typology, and point the way to improved coastal resource management by developers.

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