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THE IMPACT OF STATE REGULATION OF COASTAL LAND IN NORTH CAROLINA

A study of the effect of regulations under
the Coastal Area Management Act and
the Dredge and Fill Law on land use and land values

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I. INTRODUCTION

A. Purpose of the Study

This study was commissioned by the Office of Coastal Management of the Department of Natural Resources and Community Development (NRCD) in response to Resolution 33 of the 1979 North Carolina General Assembly, which directed the Secretary of NRCD to conduct a study of:

(1) the impact of regulation under the Coastal Area Management Act and the Dredge and Fill Law on land use and land values of private lands subject to such regulations,

(2) inequities or unfairness to landowners resulting from such regulation, and

(3) funding that would be needed in order to adequately compensate landowners for their losses as a result of such regulation.

B. Design of the Study

The study was designed (1) to assess the impact of regulations under the Coastal Area Management Act (CAMA)¹ and the Dredge and Fill Law² on land use and land values in the coastal area, and (2) from this assessment to determine whether regulations have resulted in inequities or unfairness to landowners and the amount of money that would be required if compensation of landowners was found to be warranted.

The assessment of the impact of regulation on land use and land values was made by (1) analyzing provisions of the CAMA regulations and the Dredge and Fill Law to determine how and to what extent they might restrict private use of land, (2) analyzing the regulatory actions through the permit programs of the Office of Coastal Management in selected areas to determine the extent to which regulations have in fact restricted or altered the use of land, and (3) by making field surveys in selected coastal areas to evaluate the impact of regulations under local conditions.

Regulations under CAMA that affect land use apply mainly to three types of "Areas of Environmental Concern" (AECs) that have so far been designated by the Coastal Resources Commission--Coastal Wetlands, the Estuarine Shoreline, and Ocean Hazard Areas. In each of these areas the circumstances that call for regulation are different and require different kinds of regulations, and the likely impact of regulations on land use and land values is different. The analysis of regulations and regulatory actions was therefore divided into two parts--(1) analysis of regulation in Ocean Hazard AECs; and (2) analysis of regulation in estuarine system AECs, which include the Wetland and Estuarine Shoreline AECs.

For the analysis of regulation in Ocean Hazard AECs, regulatory actions in the Ocean Hazard AECs of seven beach communities along the North Carolina coast were analyzed. These communities, all of them incorporated municipalities, are (from north to south) Kill Devil Hills, Nags Head, Pine Knoll Shores, Emerald Isle, Wrightsville Beach, Long Beach, and Holden Beach. Since these barrier island communities also contain Estuarine Shoreline and Wetland AECs, regulatory actions in these AECs were also analyzed. In addition, actions under Estuarine Shoreline and Wetland regulations and

Dredge and Fill Law regulations were analyzed in two counties, Beaufort (a county with extensive estuarine shoreline and wetland areas but no ocean shoreline) and Brunswick (a coastal county).

In analyzing the impact of CAMA and Dredge and Fill Law regulations on land use and land values, care was taken to distinguish the impact of these regulations from the impact of federal regulations, local ordinances, and other state laws and regulations. Land in coastal areas is subject to many laws and regulations, many of which existed before CAMA and the Dredge and Fill Law were enacted. For example, a permit from the U.S. Army Corps of Engineers permit is required for almost every project that requires a CAMA permit or a dredge and fill permit. Development in beach communities is governed by local zoning and construction regulations and septic tank regulations. For purposes of this study, CAMA and Dredge and Fill Law regulations are not regarded as having a restrictive effect on land use if other regulations would have an equally restrictive effect if these laws did not exist. major

During this study, local realtors, developers, government officials, and private citizens were interviewed in order to obtain additional knowledge and insight about the impact of regulation in the areas selected for study. Since the study's main task was to assess the impact of regulations on land use and land values, rather than to assess whether regulation in the coastal area is needed or desirable, no attempt was made to hold public hearings, conduct extensive interviews, or to obtain opinions from the general public. minor

The report is organized as follows. Chapter II describes the various federal, state, and local laws and regulations that affect land use in coastal areas, in particular the Coastal Area Management Act (CAMA) and the Dredge and

Fill Law. The evaluation of the effects of CAMA and the Dredge and Fill Law regulations on land use and land values is contained in Chapter III, which deals with the effects in Ocean Hazard AECs, and Chapter IV, which covers the effects in estuarine system AECs. Chapter V discusses the legal issues involved in compensating landowners for effects of regulatory actions and the relevance of these issues to this study. Chapter VI briefly summarizes the study and discusses some conclusions that might be drawn from it.

FOOTNOTES

1. N.C. Gen. Stat. § 113A-100 to -134.
2. Id. § 113-229.

II. PUBLIC REGULATION OF LAND USE IN COASTAL AREAS

A. The Present Status of Land Use Regulation in Coastal Areas

Land use in coastal areas is subject to regulation under numerous federal, state, and local laws that govern land use everywhere, but coastal area land is generally subject to more laws and regulations than other land because of the environmentally complex nature of coastal areas, because the public has a special interest in preserving the unique natural environment of the coast, because of the economic value of the estuarine system, and because accelerating economic development pressures can have especially serious detrimental consequences in the fragile coastal environment. The coastal area is subject to special regulations also because of the extensive public trust areas and the importance of navigable waters.

1. Federal Laws and Regulations. The U.S. Council on Environmental Quality has identified 27 major federal laws that affect private land use. Fourteen of these laws have special significance for land use in coastal areas (see Table I-1); of these fourteen, four laws have special significance for this study because they have a close relationship to CAMA and Dredge and Fill Law regulations.¹ They are the Federal Coastal Zone Management Act, the National Flood Insurance Act of 1968, the Clean Water Act of 1977, and the Rivers and Harbors Act of 1899.

Table I-1

Federal Laws Affecting Private Land Use Practices That Have
Special Significance for Coastal Area Land

| Name (citation) | Administering Agency | Primary Purpose | Land Use Effect |
|---|---|---|---|
| Natural Resource Laws | | | |
| Land and Water Conservation Fund (16 USC § 4601-5) | Heritage Conservation and Recreation Service | Provide financial incentives for state and local governments to provide recreation areas and opportunities. | Requires adoption of 5-year State Comprehensive Outdoor Recreation Plans to guide recreation land acquisition and development activities. |
| Coastal Zone Management Act (16 USC § 1451 et seq.) | Office of Coastal Zone Management | Assist coastal and Great Lake states in preparing and implementing state coastal plans. | Requires states to adopt acceptable coastal plans as condition for continued federal assistance; plans generally designate permissible use of coastal lands. |
| Floodplain Management Executive Order (E.O. 11988) | Council on Environmental Quality, Water-Resources Council and Federal Emergency Management Administration | Reduce the risk of flood loss and restore or preserve natural floodplains. | Prohibits federal agencies and licensees from building in the 10-year floodplain unless there is a practicable alternative. |
| Protection of Wetlands Executive Order (E.O. 11990) | Council on Environmental Quality | Minimize the destruction of wetlands. | Requires federal agencies to avoid construction in wetlands unless there is no practicable alternative. |
| Fish and Wildlife Coordination Act (16 USC § 661 et seq.) | Fish and Wildlife Service | Ensure wildlife conservation needs receive agency consideration when water-related impacts will result from federal projects. | Fish and Wildlife Service and state wildlife agencies can recommend modifications of projects to reduce impacts on wildlife habitat. |
| Water Resources Planning Act (42 USC § 1962 et seq.) | Water Resources Council | Encourage the conservation, development, and utilization of water on a coordinated basis. | Establishes River Basin commission to coordinate water and related land development; statewide water resource planning must be consistent with these planning policies. |
| Marine Protection, Research, and Sanctuaries Act of 1972 (16 USC 1431-1434) | Office of Coastal Zone Management | Designate marine areas as sanctuaries for conservation, recreation, or ecological purposes. | Allows only activities compatible with marine sanctuaries protection to be conducted within sanctuary boundaries. |
| Endangered Species Act of 1973 (16 USC § 1531 et seq.) | Fish and Wildlife Service | Conserve ecosystems for the use of endangered or threatened species. | Requires that federal agency action anticipate threats to and be consistent with survival of endangered and threatened species and their critical habitats whether or not the area is designated as critical habitat. |

| Name (citation) | Administering Agency | Primary Purpose | Land Use Effect |
|--|---|---|---|
| Community Development Laws | | | |
| National Flood Insurance Act of 1968 (42 USC § 4001) | Federal Emergency Management Administration | Reduce the risk of loss due to flooding. | Requires designated flood-prone communities to develop flood mitigation measures including land use, elevation and building requirements as a condition for flood insurance coverage. |
| Disaster Relief Act (42 USC § 5121) | Federal Emergency Management Administration | Mitigate losses from disasters and provide emergency assistance for major natural disasters. | Requires state and local governments to adopt measures which may discourage building on hazard-prone lands. |
| National Historic Preservation Act (16 USC § 470 et seq.) | Advisory Council on Historic Preservation | Protect districts, buildings, sites and objects significant to American history. | Requires that federal agency actions consider impacts of their actions on property registered in or eligible for the National Historic Register. |
| Pollution Control Laws | | | |
| Clean Water Act (33 USC § 1251 et seq.) | Environmental Protection Agency; U.S. Army Corps of Engineers | Reduce water pollution and the discharge of toxic and waste materials into all waters. | Makes grants for sewage treatment plants, which may encourage or permit growth; requires state to regulate land use practices to control pollution from indirect (non-point) sources such as urban areas; requires wetland concerns to be considered in U.S. Army Corps of Engineers dredge and fill permits. |
| Rivers and Harbors Act of 1899 (33 USC § 401 et seq.) | Army Corps of Engineers | Protect navigation, water quality, fish and wildlife, ecology, and aesthetics of navigable waters. | Requires that effects on wildlife habitat, wetlands, historic resources, and coastal zones be considered before granting a permit for activities in navigable waters. |
| Deepwater Port Act of 1974 (33 USC § 1501 et seq.) | United States Coast Guard | Regulate the construction and operation of deepwater ports on the seas to transfer oil from tankers to shore. | Requires land-based development effects to be considered in any port license and be consistent with state environmental laws or coastal zone programs. |

Source: Council on Environmental Quality, Environmental Quality - 1979, Tenth Annual Report

(December, 1979), Table 8-1, pp. 486-489.

The Federal Coastal Zone Management Act of 1972. This act authorizes federal aid to assist states in planning, implementing, and administering coastal area management programs. Although the initial efforts to develop a coastal area program in North Carolina began before this act was passed, the act has significance for North Carolina's program in two ways. First, approximately 80 per cent of the funds spent for planning and administering the state's program come from this source. Second, "consistency" provisions of Section 307 of the act--which require that federal grant programs, licenses, permits, and development projects be consistent with states' management programs and policies--give the states the power to influence federal actions in coastal areas. As a minimum, these provisions improve state and federal coordination because the state must certify that each federal action is consistent with the state coastal area management program and with state policies (the state's objection can be overridden only in cases of "national interest"). In North Carolina the consistency provisions have a potentially more far-reaching effect because federal actions must be consistent with local land-use plans, which are required by CAMA and approved by the state. To this extent local governments have the power to influence federal decisions through their land-use plans. So far the consistency provisions have not had a significant effect on land use (in one instance applications for Corps of Engineers permits were in conflict with a local land-use plan, but because of special circumstances this conflict did not affect the outcome).

The National Flood Insurance Act of 1968. This act established a National Flood Insurance Program designed to reduce flood losses through changes in building techniques and standards and a federally subsidized

insurance program. Although the program was intended to deal with the nationwide problem of flooding, it applies to flooding in beach areas. Under the program many owners of beach property are subject to special regulations but also are eligible to receive federal flood insurance, at subsidized rates, that they could not obtain from private insurance companies.

Cities and counties qualify for the program in two phases. They first qualify under the Emergency Program, which affords limited insurance coverage to property owners in flood-prone areas regardless of risk. A local government qualifies for the Regular Program after adopting ordinances that require certain "flood plain management measures," such as standards for the location and design of new buildings in flood-prone areas. In beach areas, for example, perhaps the most significant requirement is that buildings be elevated above the 100-year base flood level (the level of flooding in a flood that has a 1 per cent chance of occurring in any given year). When the Regular Program is in effect, property owners are eligible for additional flood insurance at subsidized rates that are based on the amount of risk in specific areas defined by precise flood area maps.

The fact that federal flood insurance is available to owners of property even in hazardous ocean areas is of special concern to some people involved in coastal area management, who believe that the availability of insurance encourages development in hazardous areas (the insurance is available even in areas where the Coastal Resources Commission has denied permission to build). From the standpoint of this study, the availability of flood insurance undoubtedly increases the market value of oceanfront property because it reduces the financial risks of building on the property.

The Clean Water Act of 1977: Section 404 Permits. While the Clean Water Act covers many aspects of water quality, the Dredge and Fill Program under Section 404² has special significance for coastal land use. This program, administered jointly by the U.S. Environmental Protection Agency (EPA) and the Corps of Engineers, requires a permit from the Corps for the discharge of dredge or fill materials into waters of the United States and adjacent wetlands.

There are three types of Section 404 permits. A "general permit" covers certain types of activities, such as construction of bulkheads and navigational aids, which have minimal environmental impact, both individually and collectively within relatively small geographical areas. A "nationwide permit" (a kind of general permit with nationwide application) is issued for discharge into small, minor waters or for certain minor activities, such as placement of utility poles. General and nationwide permits require only minimal review by the Corps. An "individual permit," on the other hand, must be evaluated on a case-by-case basis by the Corps, which considers such factors as environmental, economic, aesthetic, health, recreation, and water-use effects. An environmental assessment must be made for each proposed project.

EPA is authorized under the act to transfer part of the authority for approving Section 404 permits to states that have eligible programs, and the Corps is considering a delegation to the State of North Carolina of Section 404 general permits in ocean beach areas. This authority has not been transferred to the State of North Carolina, but in practice administration of state permits for dredge and fill projects under CAMA and the Dredge and Fill

Law and the Corps' administration of Section 404 permits are closely related. In accordance with Section 307 of the Federal Coastal Zone Management Act, all projects must be certified as consistent with the state coastal area management plan and state policies before they can be issued a Section 404 permit. The Corps may deny a permit even though the project is certified as consistent, but it has done so only three or four times in the history of the program.³ The Corps' staff and the state's staff also work closely. Applications for both the state and federal permits are made on the same form, the two staffs exchange information, members of the two staffs usually make field inspections together, and efforts are made to settle differences in opinion about proposed projects early in the review process so that the applicant knows early where he stands with respect to both the state and federal permits.

Although the state and federal permits for dredge and fill projects may seem to be duplicative, the criteria for approval of permits differ substantially for the two systems. Under the state's laws, the state must find that a project will have certain adverse effects before it can deny a permit. The Corps, on the other hand, may not issue a permit unless it finds, after balancing the expected benefits of the project against the expected detrimental consequences, that the project is in the public interest.⁴ In evaluating projects, the Corps must consider (1) the need for the proposed structure or work, (2) whether alternative locations or methods are available, (3) the extent and permanence of the benefits and detrimental effects on public and private uses for which the area is suited, and (4) the probable impact in relation to the cumulative effect of other existing and anticipated structures or work in the general area.⁵

Thus Section 404 guidelines differ in philosophy from the state's laws and regulations and provide broader grounds for denying permits. Under state legislation, the state must find that a project is inconsistent with state regulations before it can deny a permit, while under the Section 404 guidelines the applicant must show that the proposed project is in the public interest before it can obtain a permit. It is therefore possible that a project may be eligible for a state permit, because no adverse effects under existing regulations can be found, but ineligible for a Section 404 permit because the Corps finds that the project is not in the public interest. Even if the state should be delegated partial authority for issuing Section 404 permits, the state would be required to comply with the Section 404 guidelines, and EPA would retain the right to override state decisions.

The Rivers and Harbors Act of 1899. The Corps of Engineers has been responsible for protecting navigable waters since the Rivers and Harbors Act was enacted in 1899. In 1968 criteria used by the Corps to review permit applications were broadened to consider factors related to fish and wildlife, conservation, pollution, aesthetics, and ecology. At the same time, the Corps redefined navigable waters to include all "presently, historically, and reasonably potential" navigable waters and all waters subject to the ebb and flow of the tide, up to mean high water in tidal areas and up to ordinary high water in freshwater areas.⁶

Under Section 10 of the act, a permit from the Corps is required for all structures and work (with a few exceptions) in navigable waters. Section 10 permits apply, for example, to dredging boat access channels and basins, piers, docks, moorings, navigational aids, and canals connected to navigable

waters. The procedures and criteria for issuing Section 10 permits are similar to those for issuing Section 404 permits, as described above, except that there are only two types of permits, general and individual, and authority for issuing permits cannot be delegated to the states.⁷

2. State Laws and Regulations. As a result of the Federal Coastal Zone Management Act (FCZMA) and a generally increased awareness and concern about the coastal environment, most states with ocean or Great Lakes shorelines have moved to increase regulation of coastal land. Thirty-one of the 35 states eligible for FCZMA assistance have adopted new laws and regulations or improved implementation of existing laws as part of their state coastal area management programs.⁸ Existing and proposed state laws protect wetlands (30 states), floral and faunal habitats (24 states), beaches and dunes (25 states), barrier islands (9 states), reefs (11 states), and historic and cultural resources (19 states).⁹

In North Carolina, renewed efforts to protect the coastal environment through legislation began during the 1960s and culminated in the enactment of CAMA in 1974.¹⁰ In 1965 the state's commercial fisheries law was revised to clarify conflicting claims to submerged land, and a sand dune protection law was revised to allow more vigorous enforcement by local governments. A law requiring registration of dredging and filling equipment on publicly owned marshland, tideland, beaches, and navigable waters was enacted in 1967 in order to facilitate monitoring of dredge and fill activities (it was repealed in 1977 because it was superseded by the Dredge and Fill Law). A major package of coastal protection legislation was enacted in 1969. This legislation required permits for dredging and filling in estuarine waters (the Dredge and Fill Law), prohibited littering of navigable waters, required

permits for erecting signs and structures in navigable waters, and appropriated funds for estuarine land acquisition, staffing of estuarine protection programs, and a long-range study of the need for additional legislation (a study that led to recommendations for provisions under CAMA). Refinements in estuarine protection and sand dune protection laws were enacted in 1971, and local government authority to finance beach erosion protection projects was strengthened.

The earliest version of the Coastal Area Management Act, developed by a legislative study group in 1972, was presented to the North Carolina General Assembly in 1973. The proposed legislation was held over to the next session, and, after a series of public hearings, a revised bill that strengthened local participation in the program was enacted by the 1974 General Assembly after numerous amendments.

The Coastal Area Management Act, the Dredge and Fill law, and other statutes and regulations governing land use in coastal areas are described more fully in the following section.

3. Local Ordinances. Regulation of land use under CAMA is tied closely to regulation of land use under local zoning, building, subdivision, flood plain, sand dune, and other ordinances that apply to development in AECs. Several aspects to the relationship between CAMA regulations and local ordinances have important implications for this study.

First, CAMA regulations require that applicants meet all local regulations before a CAMA permit and other state permits can be issued. An applicant could therefore receive a CAMA permit in one community for a project that would be denied a CAMA permit in another community (because, for example,

the two communities have different minimum size-of-lot requirements). Consequently, denial of a CAMA permit does not necessarily imply that CAMA regulations have an effect on land use, because the denial may be based on the failure to meet local ordinances rather than a failure to meet CAMA regulations.

Another significant aspect of the relationship between CAMA regulations and local ordinances is that the combined effect of CAMA regulations and local ordinances may have an impact on land use in some cases in which neither alone would have this effect. An important example, particularly for purposes of this study, involves the CAMA ocean setback requirement and local street setback requirements. On some shallow oceanfront lots bounded by streets, neither the CAMA setback requirement nor local street setback requirements alone would prohibit construction of a residence, but the two requirements combined may prohibit construction if the lot is not deep enough for both requirements to be met.

Local ordinances may be more restrictive than CAMA regulations. In one beach community surveyed in this study, for example, the local oceanfront setback was greater than the CAMA setback and in fact placed all oceanfront residences outside the AEC and therefore outside the jurisdiction of the CAMA permit program.

Finally, because CAMA regulations may adequately fulfill some local objectives, some types of local ordinances may not be needed, and CAMA regulations may serve in lieu of some local ordinances. To simplify the permit process, for example, the General Assembly has repealed legislation authorizing sand dune ordinances applicable to Ocean Hazard AECs because they duplicate CAMA regulations. The CAMA ocean setback requirement may serve in lieu of a local ocean setback ordinance.

B. State Regulation of Land in Control Areas

1. The North Carolina Coastal Management Program. The North Carolina Coastal Management Program consists of the following components:¹¹

- a. state resource management laws, regulations, and standards governing coastal area land (including the Dredge and Fill Law);
- b. state policies concerning coastal management established by statutes or by authority of statutes, including policies with respect to growth management, facilities siting, industrial promotion, transportation, tourism and recreation, energy, and environmental protection;¹²
- c. the Governor's Executive Order Number 15 of October 27, 1977, which requires that actions and policies of state agencies be consistent with the goals and policies of the coastal management program; and
- d. the Coastal Area Management Act.

Thus the authority for state regulation of resources and land use in coastal areas is broad and extends beyond CAMA and the Dredge and Fill Law, which are the particular concern of this study. Federal laws and regulations and local ordinances extend the scope of government regulation even further, as the last section indicated. Nevertheless, CAMA and the Dredge and Fill Law are important components of the state's coastal management program and are among the most important laws affecting land use in coastal areas.

2. The Coastal Area Management Act (CAMA)

The enactment of CAMA.¹³ The 1969 Session of the North Carolina General Assembly, after enacting the Dredge and Fill Law, directed the Commissioner of Commercial and Sports Fisheries of the Department of Conservation and Development to conduct a study "with a view to the preparation of a comprehensive and enforceable plan for the conservation of

the resources of the estuaries, the development of their shorelines, and the use of the coastal zone of North Carolina."¹⁴ The Commissioner established a Comprehensive Estuarine Plan Blue Ribbon Committee, which proposed legislation to the 1973 Session of the General Assembly. After local government interest opposed the legislation on grounds that local governments should have a greater role in the program, the bill was held over to the next session. After a series of public hearing, a substantially revised bill was submitted to the 1974 Session, and after numerous amendments the bill was ratified on April 12, 1974.

Goals of CAMA. The goals of CAMA, as enumerated in the act, are as follows:¹⁵

To provide a management system capable of preserving and managing the natural ecological conditions of the estuarine system, the barrier dune system, and the beaches, so as to safeguard and perpetuate their natural productivity and their biological, economic and esthetic values;

To insure that the development or preservation of the land and water resources of the coastal area proceeds in a manner consistent with the capability of the land and water for development, use, or preservation based on ecological considerations;

To insure the orderly and balanced use and preservation of our coastal resources on behalf of the people of North Carolina and the nation;

To establish policies, guidelines and standards for:

Protection, preservation, and conservation of natural resources, including but not limited to water use, scenic vistas, and fish and wildlife; and management of transitional or intensely developed areas and areas especially suited to intensive use or development, as well as areas of significant natural value;

The economic development of the coastal area, including but not limited to construction, location and design of industries, port facilities, commercial establishments and other developments;

Recreation and tourist facilities and parklands;

Transportation and circulation patterns for the coastal area including major thoroughfares, transportation routes, navigation channels and harbors, and other public utilities and facilities;

Preservation and enhancement of the historic, cultural, and scientific aspects of the coastal area;

Protection of present common-law and statutory public rights in the lands and waters of the coastal area;

Any other purposes deemed necessary or appropriate to effectuate the policy of this Article.

Regulation and management under CAMA. The act establishes a "cooperative program of coastal area management between local and State governments," with responsibility divided as follows:

Local government shall have the initiative for planning. State government shall establish areas of environmental concern. With regard to planning, State government shall act primarily in a supportive standard-setting and review capacity, except where local governments do not elect to exercise their initiative. Enforcement shall be a concurrent State-local responsibility.¹⁶

Under this framework the act establishes what has been referred to under the North Carolina Coastal Management Program as a "two-tiered" management plan. The first "tier" of management involves the Areas of Environmental Concern (AECs), which are designated by the Coastal Resources Commission as geographical areas within the coastal area that have special environmental significance and are of significance outside the local area. In these areas development is subject to close state regulation under standards and regulations promulgated by the Coastal Resources Commission under a state permit system administered jointly by the state and local governments. The Coastal Resources Commission is an appointed body established by the act to supervise administration and set policy for the program.

The second "tier" of management involves all land in the coastal area outside designated AECs. Outside AECs, the state's role is limited to actions authorized by existing statutes, and "management" is accomplished through land-use plans prepared and adopted by counties and municipalities under state guidelines and approved by the Coastal Resources Commission. Land-use plans have a potential effect on land use because:

(a) CAMA permits may not be issued for development that is inconsistent with land-use plans (since CAMA permits are required only in AECs, this effect is limited to land within AECs).

(b) Local ordinances and regulations that apply to AECs must be consistent with the land-use plan; local ordinances and regulations affecting land outside AECs are subject to review by the Coastal Resources Commission, which is authorized to recommend modifications to the local government.

(c) Federal actions involving grants, licenses, permits, and development projects must be consistent with local land-use plans, as required by Section 307 of the FCZMA.

(d) In accordance with the Governor's Executive Order Number 15, certain state agency actions and policies must be consistent with land-use plans.

Areas of Environmental Concern (AECs). Under CAMA, the Coastal Resources Commission is required to designate AECs in accordance with criteria specified in the act and to establish standards and regulations applicable to development in each AEC. Under authority of the act, the Coastal Resources Commission has designated six categories or types of AECs, as described below.

Coastal Wetlands are marshlands that are subject to regular or occasional flooding by tides, including wind tides. They are environmentally significant because they provide plant materials that form the basis for the food chain of the estuary; they supply nesting, feeding, and refuge areas for waterfowl and wildlife; they serve as an erosion buffer for upland areas; they act as a nutrient and sediment trap; and they provide a unique and pleasant landscape.

Estuarine Waters are all the waters of the Atlantic Ocean within the state's boundaries and all the waters of the bays, sounds, rivers and their tributaries seaward of the line that separates coastal from inland fishing water. In estuarine waters, fresh water mixes with salt water to form the productive natural environment that supports over 90 per cent of the state's commercial catch of fish and shellfish. Estuarine waters also provide economic benefits from waterfowl hunting, marinas, boatyards, marine repairs and supplies, processing operations, tourism, commercial navigation, and recreation.¹⁷

Public Trust Areas are all waters of the coastal area landward of the line separating coastal from inland waters in which the public has acquired rights by prescription, custom, usage, dedication, or other means.¹⁸

Estuarine Shorelines are those non-ocean shorelines that are especially vulnerable to erosion, flooding, or other adverse effects of wind and water and are intimately connected to the estuary. The Estuarine Shoreline AEC extends landward 75 feet from the mean water level.¹⁹

Ocean Hazard Areas include beaches, frontal dunes, inlet lands, and other areas in which geologic, vegetative, and soil conditions indicate a possibility of excessive erosion or flood damage.²⁰ Ocean Hazard Areas are designated under authority of G.S. 113A-113(b)(6), which authorizes the

Coastal Resources Commission to designate as AECs "natural hazard areas where uncontrolled or incompatible development could unreasonably endanger life or property, and other areas especially vulnerable to erosion, flooding, or other adverse effects of sand, wind and water"

Public Water Supply Areas include small surface water-supply watersheds and public water-supply well fields.²¹

Fragile Coastal Natural Resource and Cultural Resource Areas contain environmental, natural, or cultural resources of more than local significance in which uncontrolled or incompatible development could result in major irreversible damage to natural systems or cultural resources, scientific or educational values, or aesthetic qualities.²² Five types of AECs fall into this category--Coastal Areas That Sustain Remnant Species,²³ Coastal Complex Natural Areas,²⁴ Unique Coastal Geologic Formations,²⁵ Significant Coastal Archaeological Resources,²⁶ and Significant Coastal Historic Architectural Resources.²⁷ Unlike other AECs, these AECs will be designated by the Coastal Resources Commission only after local governments, citizens, interest groups, or state and federal agencies nominate specific areas for designation.

The CAMA permit system of land-use control. Once an AEC has been designated, development projects within the area are required to have a CAMA permit, which are of two kinds:

Major Permits are required for any "major development," which is defined as any development that requires permission, licensing, approval, certification, or authorization from a state agency, or will occupy a land or water area larger than 20 acres, or involves drilling or excavating natural resources on land or under water, or occupies on a single parcel of land a structure with a ground area of more than 60,000 square feet.²⁸

Minor Permits are required for any "minor" development, which means any development other than a "major development."

Authority for administering the permit program is shared by the Coastal Resources Commission, the NRCO, and local governments. Local governments are authorized, though not required, to act as a permit-letting agency for minor permits. The Coastal Resources Commission hears appeals on permit decisions. Standards and regulations apply identically to minor and major permits.

The minor permit process. Each local government that elects to be a permit-letting agency must submit a local implementation and enforcement program for the Coastal Resources Commission's approval and must designate a local permit officer (19 counties and 25 municipalities have so elected). The local permit officer is often a local building inspector or other official who is responsible for local permits for construction and development. Most development projects require local approval, septic tank permits, sand dune permits, erosion control approval, floodway zoning permits, building permits, electrical and plumbing inspection, or subdivision and zoning approval. The local permit officer often can help applicants meet the local requirements, and Coastal Resources Commission policies encourage flexibility and coordination with other local permits.

After receiving a completed permit application--which consists of the application form, a site drawing, and a \$10 fee--the local permit officer has 30 days to place a public notice in a local newspaper, make necessary site visits, and decide whether to grant the permit, grant a conditional permit, or deny the permit (the period can be extended for 30 days if necessary to consider the application properly). A conditional permit is issued for projects that do not fully comply with regulations but would comply if the

specified conditions were met. The practice of many local permit officers is to restate regulations as conditions because the application did not meet these regulations, because the application did not clearly indicate that the regulations would be met, or because the local permit officer wants to call certain regulations to the applicant's attention. For example, the officer may state as a condition that dune grass disturbed by construction must be replanted, even though technically this is a regulation that must be met before a permit can be approved. A conditional permit is not valid unless the applicant acknowledges the conditions by signing and returning the permit in a timely fashion.

Decisions of local permit officers to condition or deny permits may be appealed; or a variance may be requested by the applicant, a holder of legal interest in the property, owners of adjacent property, the Secretary of NRCD, a local government that does not issue permits, or people who can demonstrate a history of substantial use of the property affected. An appeal, which must be filed within 20 days of the local permit officer's decision, is heard by a Coastal Resources Commission member acting as hearing officer. The hearing officer reports to the full Commission, which must make a final decision within 90 days of the application's date. If the Commission's decision is adverse, the case can be appealed to a superior court. A petition for a variance is similar to an appeal except that the petitioner must show that (a) strict application of the AEC regulations results in practical difficulties or unnecessary hardship, (b) these difficulties or hardships result from conditions peculiar to the property, and (c) these conditions could not have been anticipated by the Coastal Resources Commission when the regulations were adopted.

The major permit process. The Office of Coastal Management of NRCDC processes applications for major permits. Under authority delegated by the Coastal Resources Commission, it may grant a permit, grant a conditional permit, or deny the permit. The Office's permit coordinators in Raleigh and field consultants in Elizabeth City and Morehead City are trained to help applicants determine requirements and prepare applications. The NRCDC must act on the application within 90 days, although a 90-day extension can be made when additional time is necessary to consider the application. Proper public notice must be given, field investigations must be made, and the NRCDC must circulate the application among state agencies that have purview or expertise relevant to the proposed development. Each state agency may make an independent evaluation and submit recommendations and suggestions. Since the CAMA major permit is considered a comprehensive state permit, in that all relevant agencies must review the application, the permit will usually be granted only after other state permits are approved; if this practice should extend the decision beyond the 90-day limit, however, the CAMA permit may be issued on condition that some other state permit be granted. If the permit is denied, the applicant has 20 days to appeal.

Almost all permits approved by the Office of Coastal Management have conditions that specify how the proposed development is to be carried out. Unless the applicant appeals the conditions, he is presumed to have amended the proposal according to the conditions, and failure to comply with them is a violation.

Criteria for approval or denial of permit applications. Permit applications may be denied on the following grounds:²⁹

- For coastal wetland, that the proposed development would contravene an order of the Secretary of the NRCD, issued pursuant to G.S. 113-230, to control activities in coastal wetlands.
- For estuarine waters, that the proposed development would be denied a state Dredge and Fill permit.
- For a renewable-resource area, that the proposed development would result in loss or significant reduction of continued long-range productivity that would jeopardize future water, food, or fiber requirements of more than local concern.
- For a fragile or historic area or an area that contains environmental or natural resources of more than local significance, that the proposed development would result in major or irreversible damage to the historic, cultural, scientific, environmental, or scenic values or natural systems identified in the act.
- For fragile or historic areas and areas containing environmental or natural resources of more than local significance that are specified in the act and for public trust waters, that the proposed development would jeopardize public rights or interests specified in the act.
- For natural hazard areas, that the development would occur in such a manner as to unreasonably endanger life or property.
- For areas affected by key facilities, that the development is inconsistent with state guidelines or local land-use plans or that it is inconsistent with the above provisions.
- In any case, that the proposed development is inconsistent with state guidelines or with local land-use plans.

If the proposed development is consistent with these criteria, a permit must be granted. Or it may be issued on condition that the proposed development is altered to be consistent with the criteria.

3. The North Carolina Dredge and Fill Law. Dredging means excavating bottom materials (a) to create and maintain navigation channels, turning basins, harbors, and marinas; (b) for laying pipeline; or (c) as a source of material for fill or construction. Filling is the depositing of dredged materials, either to create dry land or to dispose of dredge spoil produced during dredging.³⁰

While dredging and filling operations can be economically beneficial, they can adversely affect coastal waters in many ways. They can create short- and long-term changes in water currents, circulation, mixing, flushing, and salinity; they may increase turbidity and pollution and lower the dissolved-oxygen level; and they may degrade local groundwater supplies. As a result, the natural productivity of coastal wetlands, bottoms, and tidelands may be diminished.

Dredge and fill projects in estuarine waters, marshlands, and tidelands require a permit from the Corps of Engineers (Wilmington Office) and from NRCD. The Dredge and Fill Law, under which the North Carolina permits are required, was enacted in 1969, but the administration of the permit process and standards and regulations under the statute have now been incorporated into the process under which CAMA is administered, and dredge and fill permits are handled the same way as CAMA major permits.

Permits may be denied if the dredge and fill project will have an adverse effect on use of water by the public; on the value and enjoyment of property

of any riparian owners; on public health, safety, and welfare; on the conservation of public and private water supplies; or on wildlife or estuarine, freshwater, or marine fisheries.³¹ Emergency permits may be approved when life or structural property is in imminent danger as a result of rapid erosion or sudden failure of a man-made structure.³²

4. Other State Regulation of Land Use in Coastal Areas. State regulation of land use in coastal areas is by no means limited to regulation under CAMA and the Dredge and Fill Law. Coastal land is also subject to numerous state laws and regulations. The major state regulatory programs affecting land use are listed below by the state department that has administrative responsibility for the program:³³

NRCD. This department administers a number of regulatory programs, and its Office of Coastal Management is responsible for administering coastal regulation under CAMA and the Dredge and Fill Law.

Water quality. A permit is required to discharge to surface waters or to operate a wastewater treatment facility.³⁴

Septic Tanks. A permit is required for septic tank systems with a capacity of over 3,000 gallons for residences, businesses, and places of public assembly.³⁵

Withdrawal of surface or ground water. A permit is required to withdraw more than 100,000 gallons of surface or ground water per day within a capacity use area.³⁶

Oil refineries. A special permit is required to construct an oil refinery.³⁷

Air pollution. A permit must be obtained to establish or operate any air contaminant source, to build or operate equipment that will emit air contaminants, to alter equipment that may emit air contaminants, or to enter into a contract for the construction or installation of an air-cleaning device.³⁸

Construction of "complex sources." A permit is required before constructing or modifying large parking lots; subdivisions, housing developments, apartment complexes, and trailer courts of 500 or more units that result in a population density of 12 persons per acre or more; large stadiums or sports arenas; drive-in theaters with 700 or more parking spaces; or large amusement parks or recreation areas.³⁹

Well construction. A permit is required to construct a well with a capacity of 100,000 gallons per day or more, to add a well to an existing system with this capacity, or to construct a well in areas where the well may endanger groundwater resources or harm the public health, safety, and welfare.⁴⁰

Dam construction or alteration. Approval must be obtained to construct, repair, alter, or remove a dam that is 15 feet or more high or covers 10 acre-feet or more in volume.⁴¹

Mining permits. A permit is required to mine or extract minerals, ores, or other solid matter.⁴²

Oil or gas well drilling. A permit is required for exploratory drilling for gas and oil.⁴³

Geophysical exploration. A permit is required for all seismic exploration work and geological, geophysical, or other surveys related to discovery and location of oil, gas, or minerals in state-owned waters.⁴⁴

Sedimentation erosion control. Approval must be obtained before engaging in any "land disturbing activity" that involves one or more acres of land (exceptions include stockpiling sand, stone, or gravel in processing yards and agricultural and forestry activities).⁴⁵

Land use along natural and scenic rivers. Land use is regulated in areas designated as Natural and Scenic Rivers.⁴⁶

The Department of Administration

Easements to fill. An easement is required to raise land above the normal high water mark of navigable waters by filling.⁴⁷

Acquisition of land for public purposes. The state may acquire land through purchase, condemnation, lease, or rental in order to carry out the public interest.⁴⁸ Uses for which land may be acquired include public parks, historic sites, and public access to public waters, development or preservation of the estuarine areas, and development of waterways.

Siting of public utilities. Construction of electricity-generating plants requires a "certificate of convenience and necessity" from the Public Utilities Commission.⁴⁹

State Ports Authority. This authority develops and operates the state ports facilities.⁵⁰

Department of Cultural Resources. The department is authorized to acquire, preserve, and protect property of historical, archeological, architectural, or cultural importance.⁵¹

Department of Human Resources.

Small septic tanks. A permit is required from the local health department before constructing a septic tank with a capacity of less than 3,000 gallons per day for residences and mobile homes.⁵²⁵

Solid wastes. Approval is necessary before operating a solid waste disposal site or facility.⁵³

Public water supply systems. Approval is required before constructing a water supply system that serves 15 or more service connections or 25 or more year-round residents.⁵⁴

The Department of Transportation.

State streets and highways. The department is responsible for land acquisition and regulation in connection with construction and maintenance of streets and highways.⁵⁵

Preservation of scenic beauty along highways. The department is authorized to regulate outdoor advertising and junkyards along highways and to purchase certain land to improve or protect scenic beauty along highways.⁵⁶

FOOTNOTES

1. Council on Environmental Quality, Environmental Quality--1979, Tenth Annual Report (December, 1979), Table 8-1, pp. 486-89.
2. Guidelines for the Section 404 program are found in 42 Fed. Reg. § 323.1 et seq.
3. Interview with Charles W. Hollis, Chief, Regulatory Functions Branch, U.S. Army Corps of Engineers, Wilmington Office.
4. 42 Fed. Reg. § 320.4(a)(1).
5. Ibid.
6. U.S. Environmental Protection Agency, Office of Water Planning and Standards, A Guide to the Dredge and Fill Permit Program (Washington: U.S. Government Printing Office, July, 1979), p. 5.
7. Guidelines specific to section 10 permits are found in 42 Fed. Reg. § 322.1 et seq.
8. Council on Environmental Quality, Environmental Quality - 1979, p. 501.
9. Ibid., Table 8-4, p. 502, and Table 8-5, p. 505.
10. This review is based on Milton S. Heath, Jr., General Background, An Overview of the North Carolina Coastal Area Management Act (Chapel Hill, N.C.: Institute of Government, January 1978), pp. 1-2.
11. For a comprehensive description and analysis of the North Carolina Coastal Management Program, see U.S. Department of Commerce, Final Environmental Impact Statement, Proposed Coastal Management Program for the State of North Carolina, Volume I, prepared by the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, U.S. Department

of Commerce, and the North Carolina Department of Natural Resources and Community Development (July, 1978).

12. See ibid., Chapter 3, for a discussion of these policies.

13. See Milton S. Heath, Jr., "A Legislative History of the North Carolina Coastal Area Management Act," North Carolina Law Review, 53 (December 1974), pp. 345-398.

14. N.C. Sess. Laws 1979, Ch. 1164.

15. N.C. Gen. Stat. § 113A-102(b).

16. Id. § 113A-101.

17. 15 N.C.A.C. 7H.0206(b).

18. Id. 7H.0207(a).

19. Id. 7H.0209(b).

20. Id. 7H.0301.

21. Id. 7H.0401.

22. Id. 7H.0501.

23. Id. 7H.0505.

24. Id. 7H.0506.

25. Id. 7H.0507.

26. Id. 7H.0509.

27. Id. 7H.0510.

28. Id. 7J.0101(1).

29. Id. 7J.0402.

30. The first two paragraphs of this section are based on U.S. Department of Commerce, Coastal Management Program and Final Environmental Impact Statement, Vol. I, pp. 127-28.

31. N.C. Gen. Stat. § 113-229(e).

32. Id. § 113-229(e1).

33. This section is based on a compendium of state legal authority for coastal land regulation in U.S. Department of Commerce, Coastal Management Program and Final Environmental Impact Statement, Vol. II, Appendix C, pp. 129-223.

34. N.C. Gen. Stat. § 143-215.

35. Id. § 143-215.3.

36. Id. § 143-215.15.

37. Id. § 143-215.100.

38. Id. § 143-215.108.

39. Id. § 143-215.109.

40. Id. § 87-88.

41. Id. § 143-215.66.

42. Id. § 74-51.

43. Id. § 113-381.

44. Id. § 113-391.

45. Id. § 113A-54.

46. Id. § 113A-30.

47. Id. § 146-6(c).

48. Id. § 146-22.

49. Id. § 62-110.

50. Id. § 143-217.

51. Id. § 121-9.

52. Id. § 130-166.22.

53. Id. § 130-116.16.

54. Id. § 130-161.1.

55. Id. § 136-66.2.

56. Id. § 136, Art. 11, 12.

III. REGULATION OF LAND IN OCEAN HAZARD AECs

A. The Basis for Regulation in Ocean Hazard AECs

Ocean hazard areas have been designated by the Coastal Resources Commission as Areas of Environmental Concern, on grounds that they are natural hazard areas, and are therefore subject to regulation under CAMA. The Ocean Hazard AECs include a narrow strip along the oceanfront that varies in width from 60 feet, as measured from the first line of vegetation on the beach, to several hundred feet in areas subject to wave action during 100-year storms (in a few places the designated area extends from the ocean to the sound). They include only a small proportion of developed or developable land on most barrier islands, but they contain all oceanfront property, and they are especially critical in terms of the CAMA goals because (1) they contain property on or adjacent to ocean beaches, which provide recreation and aesthetic enjoyment not only to owners of adjacent property but also to owners and users of property outside the Ocean Hazard AEC and to the public; (2) they contain property that is most susceptible to damage or destruction from erosion and storms; (3) they contain barrier dunes, which protect property landward of the Ocean Hazard AECs from wave and flood damage; and (4) they contain the land that bears the brunt of the dynamic natural forces that are constantly being exerted by the ocean and weather to shape and alter the barrier islands.

The regulations that the Coastal Resources Commission has imposed on development in Ocean Hazard AECs are intended primarily to deal with the effects of (1) the geological process known to marine scientists and geologists as "island migration," and (2) storms and hurricanes.¹

1. Effects of Island Migration on the Ocean Front. The summer vacationer is likely to get a false impression that the beach changes little from season to season. Actually, the beaches and islands are constantly changing, and in fact they are moving. The barrier islands that extend along North Carolina's coast are "migrating" to the west because of a gradual rise in the sea level caused by melting of polar ice (and possibly to geological changes on the ocean floor). Although the rise in sea level and the migration of islands is gradual, the effects on the ocean front can be dramatic. The sea level is rising at an estimated rate of about 1.2 feet per century at Cape Hatteras.² But where land on the coast is very flat, as it is along the Middle Atlantic coast, a gradual rise in sea level has a pronounced effect on barrier island beaches. The average rate of erosion for the Atlantic Coast from Little Egg Inlet, New Jersey, to Cape Lookout, North Carolina, has been estimated to be about 4.9 feet per year.³ The average rate of erosion along the North Carolina coast is somewhat lower but still substantial. It has been estimated that a rise in the sea level of one foot per century would result in erosion of between 100 and 1,000 feet per century along the North Carolina coast (erosion would be greater on the northern islands than on the islands further south).⁴

Average rates of erosion caused by the rise in sea level do not tell the full story, however, because erosion rates can vary dramatically, even on the same stretch of beach. The effects on particular stretches of beach depend on

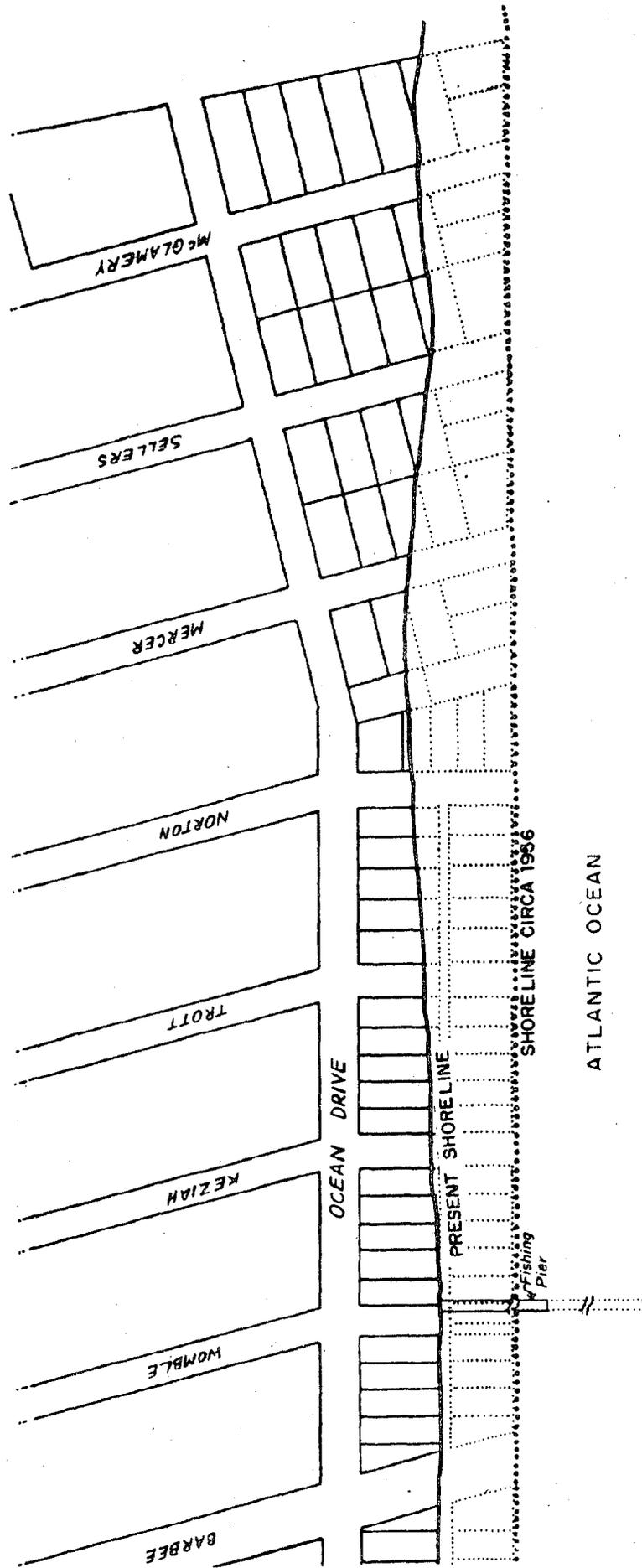


Figure III-1. Shoreline erosion at Yaupon Beach. This comparison of the shoreline as it existed around 1956 and in 1979, as estimated from local zoning maps, shows the erosion of numerous oceanfront lots. Estimated average annual erosion in this area is 5.7 feet.

many factors, including the orientation of the beach to extra-tropical storms (primarily "northeasters," which cause the most changes),⁵ the proximity to ocean inlets, and elevation. Since erosion involves a redistribution of sand along the beach rather than a permanent loss of sand, some parts of the coast may accrete rather than erode for some period of time. Some stretches of beach may erode very gradually while other stretches experience serious erosion. Numerous examples of this fact can be found in North Carolina: At Long Beach the erosion rate along most of the developed beach is relatively moderate; but Yaupon Beach, just to the north, has experienced severe erosion that has placed several rows of oceanfront lots under water (see Fig. III-1), and even at Long Beach on a stretch of the beach near Lockwood Folly Inlet, one oceanfront home had to be moved in 1978 after 80 feet of beach was eroded within three months. At Nags Head, where the rate of erosion varies with distance from Oregon Inlet (see Fig. III-3), several homes were moved inland during February 1980 because 20 feet of shoreline had eroded since the previous summer. Erosion can be especially severe and sudden, of course, during strong storms and hurricanes.

If man did not build structures on the ocean front, island migration would present no problems. The shoreline would move slowly toward land, but the beaches and dunes would return to their natural configuration by the action of wind and waves, and the islands would gradually widen and retain their elevation as sand is shifted by winds and inlet currents from the beach to the sound. The construction of oceanfront buildings and engineering devices to protect buildings interferes with the natural process and eventually will leave narrow beaches obstructed and cluttered with remnants of bulkheads and undermined buildings.

Ocean dunes have an important role in the natural process and also protect man-made structures behind the dunes. The dunes "serve as a sand reservoir that feeds the beach and back island, and provide elevation as a temporary line of defense against wind and waves." They also constitute "the natural, main line of defense against erosion and storm damage to man-made structures."⁶ Although dunes serve to protect beach property temporarily, like man-made structures on the oceanfront, they will eventually succumb to the long-term process of island migration. Attempts to duplicate the protective function of dunes by building bulkheads or seawalls are not merely temporary expedients--they hasten the process of beach erosion, increase erosion on the beach next to them, and interfere with the process by which the beach is re-formed further inland as island migration continues. During storms, high-energy waves flatten a beach; this process dissipates the waves' energy and allows sand to be returned to the beach later by ordinary wave action. But when a bulkhead or seawall is built, the force of waves is expended directly against the bulkhead or seawall and is then reflected to the beach, causing the beach gradient to steepen, which in turn increases the storm-wave energy striking the beach. Bulkheads and seawalls increase the intensity of long-shore currents, prevent exchange of sand between the beach and dunes, and increase wave and current action at the ends of the wall, increasing erosion at those points.⁷ Groins and jetties, which are built perpendicular to the beach to trap sand, rob other areas of sand, and therefore one groin or jetty requires another.⁸

Thus, it is argued, attempts to save beaches through "shoreline engineering" may not only be ineffective in the long-run but may also tend to destroy the beaches they are designed to save. Examples often cited are the

high seawalls and absence of beaches in parts of New Jersey (the process has been referred to as "New Jerseyization") and in the disappearance of the beach at Miami Beach.

2. The Effects of Storms and Hurricanes. While island migration is a gradual process, erosion can be swift and dramatic during storms and hurricanes, which also have an awesome potential for destroying property directly through the force of winds, waves, and pressure changes. Although hurricanes are more spectacular and have greater potential for causing damage to structures wherever they are located on the barrier islands, the extra-tropical storms, especially northeasters, cause more erosion and shoreline change because of their greater frequency. The frequency of hurricanes on the Outer Banks is 0.5 per year, for example, while the frequency of extra-tropical storms there is 34 per year.⁹

The normal or typical path of hurricanes carries them over or near North Carolina's barrier islands (Cape Hatteras is known as "Hurricane Alley"). Over the long term, a major hurricane can be expected to hit the North Carolina shoreline every two to three years. During the 1950s, seven major hurricanes hit the North Carolina coast, and three others passed nearby. The most notorious was Hurricane Hazel, which devastated southern beaches in 1954; it destroyed 89 buildings at Wrightsville Beach and damaged hundreds of others¹⁰ and left, according to local residents, only four or five residences standing on Holden Beach. During the 1960s and 1970s, hurricanes tended to miss the North Carolina coast, and the few that came close by, like David in 1979, did relatively little damage.

Thus much of the existing development on the coast occurred during a long lull in hurricane activity that permitted people to forget the awesome

destructive potential of these storms. Hurricanes can generate winds of 190 mph or more and cause the tides to rise 12 feet or more above mean sea level (this does not include the height of waves above the sea level). During hurricanes and other major storms, the islands are subjected to severe erosion, wind damage, sudden air pressure changes, overwash, and even the formation of new inlets. During hurricanes storm water is pushed landward between the islands and the mainland. When the storm center passes, this water recedes toward the ocean and may form an inlet or wash over the island.

The shoreline near inlets is especially unstable because of the strong currents that pass through them during storms and normal tides. Inlets can shift suddenly, and over relatively short periods of time they can migrate over a considerable area of the islands. Yet it is common to see expensive homes built near inlets, where the ocean vistas can be especially dramatic. On the eastern end of Holden Beach, four blocks of ocean front lots platted in the late 1930s lie under Lockwood Folly Inlet (see Fig. III-2), and several houses have been moved from adjacent oceanfront lots. On the western end of the island is a subdivision platted in January 1978; as of December 1979, several oceanfront lots had already been eroded away, and the road constructed behind them had been destroyed by water.

3. The Rationale for Regulation. The natural process of beach erosion because of island migration and the hazards to life and property from storms and hurricanes suggest a number of reasons for regulations to protect the public interest. These reasons may be classified under two headings. First, development of land or development practices may cause "external effects"--that is, the actions of private landowners may cause harm to other

property owners or to the public. Second, owners or users of private property may themselves suffer injury, loss of life, or property damage or destruction because of improper development practices.

External effects. A person who develops oceanfront property may impose losses on other property owners or the public in a number of ways. Erosion of the beach in front of a structure may cause the structure to encroach on the beach. A dramatic example is found at Wrightsville Beach, where the Holiday Inn (constructed in 1967) and several adjacent residences (constructed during the last three or four years) now obstruct the beach--to walk eastward on the beach at high tide, one must wade through the surf or walk behind these structures. In the past it was common for developers to level dunes, either to provide a flat building space or to provide an unobstructed view of the surf. This leveling reduces or eliminates the natural protective function of the dunes and causes flooding on adjacent property during storms or high tides. As discussed earlier, bulkheads or seawalls built to protect structures from erosion increase the beach gradient and may increase erosion on adjacent beach areas. Furthermore, they cannot withstand wave forces very long, and their remnants may obstruct the beaches. Oceanfront structures that cannot withstand the forces of storms may cause damage to other property as roofs, boards, or entire structures are blown or washed against other structures. And, of course, poorly constructed structures may lead to injury or loss of life to those in the residences or to others.

Private loss or damage. Owners of private land on the oceanfront may suffer damage, destruction, capital loss, and (conceivably) injury or loss of life because of erosion or storms. Although most owners of oceanfront

property have seen the value of their property increase substantially over the years, many property values have been reduced substantially by erosion and inlet migration.

The potential for private losses presents several public policy issues. In some cases a person who builds a residence on oceanfront property risks damage or loss to only his own property if the house is well constructed so that it does not harm other property during storms. For example, a person who builds on a lot between two existing houses may not significantly increase the potential harm to the public interest that would be caused by erosion in front of the structures. Should this person be allowed to build the residence if there is a substantial risk that it will be undermined by erosion in, say, 15 or 20 years? Even if the person knows the risks involved and is willing to build the house anyway, does the state have a duty to keep him from building it because another person may purchase it later without knowing the risks?

There are two opposing viewpoints on this issue. One view is that building structures close to the ocean is foolish because of the risks of erosion and storm damage, and therefore regulations should prohibit such structures or at least require that they be placed far enough from the ocean to escape destruction from erosion during their life. The other viewpoint is that a person should be allowed to build a structure on the beach as long as he is willing to accept the risk of property loss and as long as his structure does not produce external effects that would harm other property owners or the public.

Given the substantial risks of building oceanfront structures, it is understandable that many people consider it foolish to build them close to the ocean. But there are several reasons for building close to the ocean despite

the risks. First, if the structure is damaged or destroyed, the owner may be able to recover his losses through the federal flood insurance program, which costs the owner relatively little in premiums because the program is subsidized by the federal government (owners covered by this program are likely to recover losses that are due to storm damage; whether they will be able to recover losses due to regular erosion is questionable since the loss must result from an unpredictable event, and erosion is often predictable). Second, if an owner suffers losses that are not covered by insurance, he may deduct his losses as a casualty loss on his state and federal income tax returns. Since most owners of oceanfront property are well off and therefore in high income tax brackets, a substantial proportion of their losses can be offset by the casualty loss deduction. Third, oceanfront property has been rising in value, and therefore the potential for loss may be offset somewhat by expected capital gains. Finally, in a rational decision to invest in oceanfront property, a person would discount future costs and benefits, and costs incurred in later years have a relatively low present value while benefits received in earlier years have a relatively high present value. In other words, the present value of the amount of money needed to cover a loss sustained in the future is relatively small (for example, the present value of a dollar that is due in 20 years is only \$0.21 at 8 per cent interest).

For these reasons it may be entirely rational for people to build oceanfront structures even when they are fully aware of substantial risks of damage or loss. Thus it may be argued that the rationale for prohibiting people from taking the risk is questionable unless there are external effects associated with the development. It may be more appropriate to have laws that require full disclosure of the risks involved to prospective purchasers and to

regulate only the external effects associated with the development. For example, it may be appropriate to allow construction close to the ocean but prohibit bulkheads, to impose construction standards adequate for storms, and to require owners of structures to remove them once erosion has caused them to encroach on the beach.

On the other hand, it can be argued that structures should not be permitted close to the ocean because eventually, when the beach has eroded and the structure is threatened, owners will insist on the right to protect their property with bulkheads and seawalls, and the public may have to pay for beach restoration (as in the beach-restoration project currently under way at Wrightsville Beach at a cost of \$2.5 million in public funds).

B. Delineation of Ocean Hazard AECs

The Coastal Resources Commission has designated as AECs certain areas near the ocean where, "because of their special vulnerability to erosion or other adverse effects of sand, wind, and water, uncontrolled or incompatible development could unreasonably endanger life or property."¹¹ These ocean hazard areas include beaches, frontal dunes, inlet lands, and other areas where "geologic, vegetative, or soil conditions indicate a substantial possibility of excessive erosion or flood damage."¹² The Commission has defined three Ocean Hazard System AECs, as described below.¹³

1. Ocean Erodible Areas are areas "in which there exists a substantial possibility of excessive erosion and significant shoreline fluctuation." The seaward boundary is the mean low-water line. The landward boundary is delineated by (a) a "setback" from the first line of vegetation on the beach, and (b) the 100-year-storm recession line. The setback is determined by

multiplying the average annual rate of erosion in feet times the factor 30, a number chosen apparently to approximate the life of a beach-front structure or the maximum life of a mortgage. If the average annual erosion rate were three feet per year, for example, the setback would extend landward 90 feet from the first line of vegetation. The minimum setback distance is 60 feet, so the Ocean Hazard Area is a minimum of 60 feet wide, as measured from the first line of vegetation. The 100-year-storm recession line is the line of erosion expected from the strongest storm likely to occur in a period of 100 years. Thus the Ocean Erodible Area is at least 60 feet wide but may be wider if the average rate of erosion exceeds two feet per year or if the 100-year-storm recession line is landward of the setback.

2. High Hazard Flood Areas (also called "velocity zones" or "V-zones") are areas subject to high-velocity waters in a 100-year storm as identified on flood insurance rate maps for the federal flood insurance program. In areas with low elevation, the high-hazard flood area may extend landward of the Ocean Erodible Area, and in a few places it may extend across the entire island.

3. Inlet Hazard Areas are those lands identified by the State Geologist as having a substantial possibility of excessive erosion that are located adjacent to inlets. The area is delineated by the expected extent of migration of the inlet.

The lands within these three areas are designated AECs and therefore are subject to regulation under CAMA. On most barrier islands only a small percentage of land and development falls within these AECs. On beaches where erosion rates are low and frontal dunes are high, the Ocean Hazard system of AECs may include only 60 feet of land, as measured from the first line of

vegetation. At Pine Knoll Shores, a local ordinance requires oceanfront residences to be set back 100 feet from the first line of vegetation, so even oceanfront houses do not fall within the AEC and therefore are not subject to CAMA regulations (only walkways and other construction on the dunes within the 60-foot setback require CAMA permits). In Dare County, where the islands are low and narrow, and in Topsail Beach and Surf City, the High-Hazard Flood Area extends well inland of the Ocean Erodeable Area in places.

C. CAMA Ocean Hazard AEC Regulations

The Coastal Area Management Act provides indirectly a rationale for regulation of private development in the Ocean Hazard AECs. One goal of the act is "to provide a management system capable of preserving and managing the natural ecological conditions of the estuarine system, the barrier dune system, and the beaches, so as to safeguard and perpetuate their natural productivity and their biological, economic, and aesthetic values."¹⁴ This goal makes clear the intent to protect beaches and barrier dunes, but it does not provide a clear rationale for regulating land behind the barrier dunes. Justification for such regulation might be traced to other stated goals: "To insure that the development . . . of the coastal area proceeds in a manner consistent with the capability of the land . . . for development, use, or preservation based on ecological considerations; to insure the orderly and balanced use and preservation of our coastal resources; (and) to establish policies, guidelines, and standards for: (1) protection, preservation, and conservation of natural resources . . . and management of transitional areas . . . (and) areas of significant natural value."¹⁵

A more direct indication of the act's intent is the authority it gives for the Coastal Resources Commission to designate Ocean Hazard AECs. Ocean Hazard AECs may be designated as "natural hazard areas where uncontrolled or incompatible development could unreasonably endanger life or property, and other areas especially vulnerable to erosion, flooding, or other adverse effects of sand, wind, and water" These natural hazard areas must fall specifically in one or more of the following categories:

- a. Sand dunes along the Outer Banks;
- b. Ocean and estuarine beaches and shoreline;
- c. Floodways and floodplains;
- d. Areas where geologic and soil conditions are such that there is a substantial possibility of excessive erosion or seismic activity, as identified by the State Geologist; or
- e. Areas with a significant potential for air inversions, as identified by the Environmental Management Commission.¹⁶

This provision suggests that one rationale for regulating use of land behind the barrier dunes is the protection of life and property; another rationale would be the land's special vulnerability to adverse effects of sand, wind, and water. Thus the act provides clear guidance that regulations should protect and preserve the beaches and barrier dunes, while regulations for the use of land behind the barrier dunes should deal with effects of natural hazards, including erosion and flooding. The act does not expressly say that development behind the barrier dunes can be regulated on grounds that, because of erosion, structures may eventually encroach on the beach, but taken as a whole the provisions referred to have been read by the Commission as granting this authority. The act does seem to authorize regulations that would prohibit development of oceanfront property in such a way as to "unreasonably" endanger property, even if only private costs are involved and the property owners are willing to assume the risks involved.

Regulations imposed by the Coastal Resources Commission on construction within Ocean Hazard AECs fall generally into four categories according to purpose: (1) regulations to control shoreline, beach, and dune erosion; (2) regulations to ensure construction standards adequate to protect property from ocean and weather hazards; (3) regulations that require buildings to be set back a minimum distance from the first line of vegetation to reduce property damage and beach encroachment; and (4) regulations governing construction of public facilities that may have adverse effects on the coastal environment.

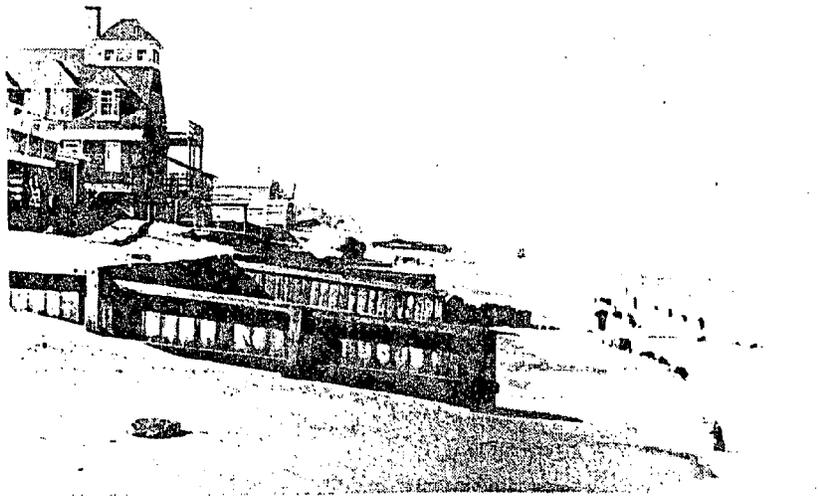
1. Erosion Control. Before CAMA, a common practice of builders was to level barrier dunes to provide a flat building space or to obtain a view of the ocean. Little was done to protect vegetation on dunes during construction or to restore vegetation after construction. Bulkheads and seawalls were commonly used in attempts to prevent erosion even though, as explained above, they are at best a temporary solution and tend to increase erosion of the beach in front of and adjacent to them.

Several CAMA regulations are designed to protect primary and frontal dunes from destruction or damage from construction:

In order to avoid weakening the protective nature of primary and frontal dunes, no development will be permitted that involves the removal or relocation of primary or frontal dune sand or vegetation thereon. If possible, other dunes within the ocean hazard area shall not be disturbed.¹⁷

All development (except accessways across dunes) must be placed landward of the crest of the primary dune,¹⁸ and structural accessways must be built to have a minimum impact on the dunes--they must be less than six feet wide, only the posts or pilings may touch the sand, and vegetation must be restored.¹⁹

In the past, owners of oceanfront property could buy time by constructing seawalls, bulkheads, groins, or jetties to protect their property from beach erosion. But seawalls or bulkheads are vulnerable to the force of ocean waves and, as explained above, they have external effects because they increase erosion on the beach adjacent to them. Under current CAMA regulations, seawalls, bulkheads and other "shoreline erosion control structures" (except beach nourishment and berm projects) will not be allowed if their purpose is to protect property constructed after June 1, 1979.²⁰ Owners may obtain permits to protect threatened property in emergencies if the property was constructed before June 1, 1979.²¹



Remnants of bulkheads, septic tanks, and cisterns litter the beach at Kill Devil Hills.

Regulations also govern establishment of new dunes and dune stabilization.²² New dunes must be aligned with existing dunes; existing dunes may not be broadened or extended toward the ocean; damage to existing vegetation must be minimized and vegetation must be restored; sand of the same nature must be brought in from outside the Ocean Hazard AEC; and no new dunes may be established in Inlet Hazard Areas.

2. Construction Standards. Structures on the oceanfront are subjected to extraordinary forces of wind, tide, waves, and flooding. When oceanfront structures are damaged or destroyed, they in turn may cause damage as winds and water propel fragments or entire structures against nearby property. CAMA regulations therefore impose special standards on construction within Ocean Hazard areas.²³ The regulations, which are intended to minimize damage due to fluctuations in ground elevation and wave action during a 100-year-storm, require that construction comply with the "windstorm resistive" construction standards of the North Carolina Residential Building Code, that pilings be 8 inches in diameter or 8 inches square, that pilings be placed eight feet below the lowest ground elevation under the structure, that pilings for structures built on a primary dune or nearer to the ocean be placed four feet below mean sea level, that foundations be designed to meet ground elevation and wave forces during a 100-year storm, that decks and walkways be designed to break away from the structure, that all pilings be adequately treated, that the lowest structural part of the building be above the 100-year-storm elevation, that exposed metal structural connections be adequately rust-proofed, that utility systems be located and constructed to minimize storm damage, and that walls beneath the 100-year-storm levels be designed to break away without harm to the structure. Except for the standard on size of pilings, these standards are also required by flood plain ordinances under the federal flood insurance program. (Construction standards also prohibit impermeable surfaces such as asphalt and cement above the functional parts of septic tank systems.)

Mobile homes are not permitted in the Ocean Hazard AECs unless they are placed in mobile home parks that existed as of June 1, 1979 (under the federal flood insurance program mobile homes are not permitted in V-zone areas, although the effective date of this restriction varies with the date of adoption of the flood plain ordinance).

3. The Setback Requirement. The setback requirement is currently the most controversial CAMA regulation. It has resulted in several permit denials, and it possibly proscribes building a structure on numerous oceanfront lots. Before July 1, 1979, CAMA regulations required structures to be placed behind the crest of the primary dune. Since dunes are quite irregular, it was often difficult to identify the primary dune. The regulation was therefore changed to require that (a) structures be placed behind the crest of an existing primary dune but (b) if a primary dune is not present, the structure must be placed the "maximum feasible distance" behind the first line of vegetation but at least behind the setback line that defines Ocean Erodible Areas (that is, a distance from the first line of vegetation equal to 30 times the annual erosion rate in feet). The problem presented by this regulation is that many oceanfront lots were not very deep when they were platted during previous decades or--more commonly--the lots have eroded. Most beach towns have an ordinance requiring structures to be set back, usually 30 feet, from the street right-of-way (or, in some cases, from the center of the street). The minimum CAMA setback is 60 feet; so a structure 30 feet deep would require that the lot be at least 120 feet deep if the local street setback was 30 feet. Although variances can sometimes be granted to reduce the street-side setback, some lots are not deep enough to permit construction even then. In most beach communities the CAMA setback is 60 to 70 feet, so the setback prohibits structures on only small lots (but because some local ordinances incorporate a setback or impose a minimum lot size, the structure would not be allowed even if CAMA did not exist). In one stretch of beach beginning in Long Beach and extending through Yaupon Beach to Caswell Beach, a high erosion rate of over four feet per year results in a CAMA setback of 140 feet, which proscribes development of several existing lots.

4. Regulation of Public Facilities. The regulation governing public facilities reads as follows:

In order to avoid excessive public expenditures for maintaining public safety, construction or placement of growth-inducing public facilities to be supported by public funds will be permitted in the ocean hazard area only when such facilities:

- (1) clearly exhibit overriding factors of national or state interest and public benefit,
 - (2) will not exacerbate existing hazards or damage natural buffers,
 - (3) will be reasonably safe from flood and erosion related damage,
 - (4) will not promote growth and development in ocean hazard areas.
- Such facilities include, but are not limited to, sewers, waterlines, roads, bridges, and erosion control structures.²⁴

5. Regulation for Other Purposes. CAMA regulations have other purposes than those discussed above:

- Valuable architectural or archaeological resources are protected;²⁵
- Development must not create undue interference with legal access to or use of public resources;²⁶ and
- Impermeable surfaces such as asphalt and cement may not be placed above functioning parts of septic tank system.²⁷

D. Evaluation of the Effects of CAMA Regulations in Ocean Hazard AECs

1. Regulation Under the Minor Permit Program. To evaluate the effects that CAMA regulations have had on land use and land values in Ocean Hazard AECs, an analysis was made of the disposition of minor permit applications between the date the permit programs became effective, March 1, 1978, and November 30, 1979, in a sample of beach communities located in different parts of the North Carolina coastline. The communities selected were, from north to south, Kill Devil Hills, Nags Head, Pine Knoll Shores, Emerald Isle, Wrightsville Beach, Long Beach, and Holden Beach. Minor permits for development in

Ocean Hazard AECs in these communities during the first two years of the permit program represented 57.1 per cent of all minor permits issued for development in Ocean Hazard AECs. The selected beach communities are relatively well-developed communities located in generally highly developed areas of the coast. The only area not represented was the relatively undeveloped portion of the Outer Banks between Nags Head and Cape Lookout.

All minor permit applications for development in Ocean Hazard AECs in these communities were examined and analyzed. Table III-1 shows the disposition of minor permit applications at the seven beach communities. Of the 191 permit applications, 173 (90.6 %) were approved, nine (4.7 %) were approved with one or more conditions, and nine (4.7 %) were denied. The official records show a larger number of conditional permits, but in this tabulation many of these conditional permits were counted as approved permits because in many instances the conditions merely restated regulations or standards that are required to be met before a permit is approved. Local permit officers often restate regulations as conditions to call the regulation to the attention of the applicant (for example, a common condition is that dunes must be replanted if they are damaged during construction). While this practice serves a useful purpose, such conditions add nothing of substance to the regulations; therefore permits conditioned in this manner were regarded as approvals for purposes of this analysis.

Table III-2 shows the types of development covered by the minor permits in the seven communities. Almost three-fourths (73.8 per cent) of the permits covered construction of residences, and over half (59.7 per cent) covered single-family residences. Walkways and decks were covered by 11 per cent of the permits.

Table III-1

Final Action Taken on Ocean Hazard Area Minor Permit Applications
At Beaches Selected for the Study, March 1, 1978, to November 30, 1979.

| Beach area | Permits granted | | Conditional permits granted ¹ | | Permits denied | | Total no. appli- cations |
|--------------------|-----------------|------------|--|------------|----------------|------------|-----------------------------------|
| | no. | % of total | no. | % of total | no. | % of total | |
| Emerald Isle | 28 | 80.0% | 5 | 14.3% | 2 | 5.7% | 35 |
| Holden Beach | 25 | 86.2 | 2 | 6.9 | 2 | 6.9 | 29 |
| Kill Devil Hills | 3 | 75.0 | 0 | 0.0 | 1 | 25.0 | 4 |
| Long Beach | 46 | 92.0 | 0 | 0.0 | 4 | 8.0 | 50 |
| Nags Head | 49 | 98.0 | 1 | 2.0 | 0 | 0.0 | 50 |
| Pine Knoll Shores | 9 | 100.0 | 0 | 0.0 | 0 | 0.0 | 9 |
| Wrightsville Beach | 13 | 92.9 | 1 | 7.1 | 0 | 0.0 | 14 |
| Total | 173 | 90.6% | 9 | 4.7% | 9 | 4.7% | 191 |

1. CAMA permit officers often restate regulations as conditions on the permit. These cases were counted as permits granted rather than conditional permits since the officers' purpose is merely to call the attention of the applicant to the regulations.

Table III-2

Distribution of CAMA Ocean Hazard Area Permits in
Selected Beach Communities

| <u>Type of activity</u> | <u>Number of Permits</u> | <u>Percentage of total</u> |
|---|------------------------------|--------------------------------|
| Construction of oceanfront residences: | | |
| Single family residences | 114 | 59.7% |
| Duplex residences | 24 | 12.6 |
| Multiple unit residences | 2 | 1.0 |
| Additions to residences | 1 | 0.5 |
| Total | 141 | 73.5 |
| Construction of commercial structures | 2 | 1.0 |
| Construction on dunes: | | |
| Walkways and decks | 21 | 11.0 |
| Emergency vehicle access | 3 | 1.6 |
| Public access ramp | 1 | 0.5 |
| Total | 25 | 13.1 |
| Erosion control measures: | | |
| Bulkheads | 8 | 4.2 |
| Repair frontal dune | 5 | 2.6 |
| Total | 13 | 6.9 |
| Other: | | |
| Pierhouse | 1 | 2.5 |
| Push sand before construction | 6 | 3.1 |
| Move house | 1 | 0.5 |
| Remove sand from deck | 2 | 1.0 |
| Total | 191 | 100.0 |

Permits were denied in only four of the communities--Emerald Isle (2), Holden Beach (2), Long Beach (4), and Kill Devil Hills (1). No denials occurred in Nags Head, Pine Knoll Shores, or Wrightsville Beach. Each denied-permit case is described later. Only twice did a denial prevent an applicant from building a structure on his lot (i.e., Holden Beach Denial #1 and Kill Devil Hills Denial #1). In five of the denials, permit applications to build residences of a certain size on oceanfront lots were denied but the denial did not proscribe the construction of a residence of a size and configuration that would meet the CAMA setback and local street setback requirements (in one case a house has been built on a lot for which a permit was denied earlier). The other denials involved construction of a bulkhead and emergency bulldozing to fill a gap in sand dunes. Thus in only two out of 191 cases in the selected communities did CAMA regulatory actions proscribe development of property, and in one of these cases the proposed development would not have complied with local ordinances. Both of these cases involved eroded lots that are highly vulnerable to ocean and weather hazards. In both cases a residence that previously existed on the property had been moved to avoid damage or destruction. And in both cases the area had a history of severe and chronic erosion. The nine permit denials are described below:

Permit Denials that proscribe development of lots

Holden Beach denial #1. The applicant proposed to build a single-family residence on an oceanfront lot in the Inlet Hazard Area on the east end of Holden Beach, an area where numerous lots had been covered by water because of movement of Lockwood Folly Inlet (see Fig. III-2). Many lots to the east of the applicant's lot have been covered by water, and several houses have been

moved from lots to the east. In 1938 the distance from the center of the road fronting the applicant's lot to the toe of the dune was 302 feet. By 1962 this distance had been reduced to 96 feet, and the escarpment was only 10 feet from the foundation of a house that has been moved from the lot. In 1974, storm overwash came to about 20 feet from the center of the road. In 1977, the distance from the center of the road to the first line of vegetation was 105 feet. Sometime before the application was filed, the Corps of Engineers placed fill from inlet dredging on the lot, but this material was expected to erode quickly. At the time of application, the lot was 85 feet deep (measured from the high-water line) and 50 feet wide (4,250 square feet). The lot had been appraised for tax purposes as underwater land with a taxable value of \$100.

When the application was made, the CAMA setback regulation was not in effect (the lot would not have met this requirement). The application was denied on grounds that development would "unreasonably endanger life and property," that the lot was not consistent with local ordinances requiring a minimum of 5,000 square feet, that the lot was below the minimum elevation required by the flood plain ordinance, and that the proposed development would not meet a local requirement that oceanfront residences be located 100 feet from the mean high-water line.

The applicant appealed the denial. The hearing officer found that the permit application should be denied because it violated G.S. 113A-120(6) in that development would unreasonably endanger life or property--"namely, a residential unit built on this lot has a substantial probability of being damaged by storms, normal erosion, or water from the inlet"--and further because it violated G.S. 113A-120(8) in that it was inconsistent with the

local land-use plan, local ordinances, and flood-plain regulations. The Commission affirmed the denial.

Kill Devil Hills Denial #1. The applicant proposed to build a single-family residence measuring 24 feet wide and 32 feet deep on an oceanfront lot that measured 72 feet from the first line of vegetation to the rear of the property line. The lot had no primary dune, and the remains of a timber seawall were located about 26 feet from the rear property line. The town required a 10-foot setback from the road right-of-way, and the CAMA setback from the first line of regulation in this area is 78 feet. Thus the setback line was behind the rear property line (i.e., in the road right-of-way). The lot is located in an area that has had chronic erosion problems, and in February 1980 there was evidence of recent overwash on this and other lots in the vicinity. The applicant's variance petition was denied.

Permit Denials that Do Not Proscribe Development of Oceanfront Lots

Emerald Isle Case 1. The owner of an oceanfront lot 50 feet wide by 150 feet deep applied for a CAMA permit to build a two-story duplex residence 30 feet wide and 38 feet deep (including a 10-foot deck). The siting of the residence had to be consistent with a local ordinance requiring a 30-foot street setback and the CAMA setback of 60 feet from the first line of vegetation. The CAMA setback was not the only constraint in this situation, however, because even without the setback requirement the structure would have had to be sited in approximately the same position in order to be behind the crest of the primary dune. A single-family house could have met the requirements for a CAMA permit, but because a duplex required two septic tank systems instead of one, the planned construction did not have enough space after the local and CAMA setback requirements were met for the two septic tank

systems. A septic tank permit was obtained on the condition that the dune be leveled to provide space for the two septic tanks, but CAMA regulations did not permit the dune to be leveled.

Thus while the CAMA setback, together with the local setback ordinance and septic tank requirements, proscribed the building of a duplex, it did not proscribe the building of a single-family residence, and therefore the market value of the lot probably would not be seriously affected.

Long Beach Denial #1. The applicant wanted to build a single-family residence measuring 34 feet wide and 38 feet deep (excluding front and rear porches) on an oceanfront lot that had no primary dune. The distance from the first line of vegetation to the porch would have been 47.8 feet, and the distance from the rear porch to the road would have been 30 feet, the minimum allowed under local ordinances. The annual erosion rate is less than two feet per year, so the CAMA setback here is 60 feet. The applicant was therefore limited to building a house 41.8 feet deep, including front and rear porches--12.2 feet less than the proposed structure; this limitation nevertheless would have allowed the applicant to build a two-story residence of 2,840 square feet (assuming the same width as the proposed structure).

Long Beach Denial #2. The applicant wanted to build a single-family residence measuring 50 feet wide and 34 feet deep on an oceanfront lot measuring 91 feet deep and 74 feet wide that had no primary dune. The house would have been 33 feet from the first line of vegetation, or 27 feet within the CAMA setback line. Since the town would have allowed the applicant to place the structure 20 feet from the road right-of-way instead of 30 feet, as proposed, the applicant was restricted to building a residence only 27 feet deep. He could therefore have built a two-story house of 2,700 square feet.

Long Beach Case #3. The applicant proposed to build a single-family residence measuring 34 feet wide and 32 feet deep on an oceanfront lot that was 50 feet wide and approximately 89 feet deep. The structure would have been only 39 feet from the first line of regulation instead of a minimum of 60 feet, as required by the CAMA setback regulation. A variance was requested but denied. The lot is large enough for a house to be built on it if it is designed to meet the setback requirement.

Long Beach Case #4. The applicant proposed to build a single-family residence measuring 34 feet wide by 36 feet deep with an eight-foot front porch on an oceanfront lot 50 feet wide and approximately 97 feet deep. The CAMA setback regulation required the structure to be at least 60 feet from the first line of vegetation; the applicant proposed to place the house only 31 feet from the first line of vegetation. The setback requirement does not, however, prohibit the applicant from building a residence on this lot if it had maximum dimensions 20 feet deep and 34 feet wide.

Other Denials

Holden Beach Case #2. The applicant proposed to bulldoze sand to fill a gap in the dunes in order to prevent overwash that might damage a road and the area behind the dune. The permit was denied because the proposed action was not considered to be necessitated by an emergency, as required by the regulations, and because the applicant planned to push sand from the beach area (regulations provide that sand must be hauled from the outside the area).

Emerald Isle Case #2. The owner of an existing single-family residence located in an area where the erosion ratio is low--less than two feet per

year--applied to build a bulkhead in front of the property, to which the owners of adjacent property objected. The permit was denied on grounds that it was not needed and that it might increase erosion on adjoining property. This denial appeared to have no appreciable effect on the value of the owner's property, since the residence was not imminently threatened by erosion.

2. The Effects of CAMA Regulations in Selected Beach Communities

Holden Beach. Holden Beach, an eight-mile-long barrier island on the southern portion of the North Carolina coast in Brunswick County, has experienced severe erosion on the eastern and western ends of the island because of inlet migration and gradual erosion of the middle portion of the island. The entire island was subject to overwash before Hurricane Hazel, and though overwash has been common only on the western end since then, the insufficient vegetation and elevation makes the island susceptible to damage from wind, waves, and storm-surge flooding during major storms.²⁸ Hurricane Hazel did major damage here; according to residents, it left only four or five residences standing.

The effects of inlet migration are dramatically demonstrated at Holden Beach. On the eastern end, several blocks of lots platted in 1937 have been covered by water because of migration of Lockwood Folly Inlet (Fig. III-2), the nearby oceanfront has been severely eroded, and several residences have been moved to avoid destruction. The western end of the island remains undeveloped, but a subdivision was platted in January 1978 and a loop road was constructed. Since then, many of the oceanfront lots have been eroded and part of the loop road behind the oceanfront lots has been destroyed.

The average annual rate of erosion on this portion of the coast is moderate, and the effects of erosion on oceanfront structures have been relatively minor (except near inlets) because, on most of the oceanfront, two lots were platted in front of the main road. Since the oceanfront lots have eroded somewhat over the years, the two front lots have usually been treated as one, and in recent years residences have been placed on the second lot or centered on the two lots.

Because the two oceanfront lots are treated as one, the effect of the CAMA setback requirement has been relatively minor. The CAMA setback at Holden Beach is 68 feet, and the town requires a 25 foot setback from the road. Since most of the oceanfront lots were platted originally to be 125 feet deep, the effects of erosion would have prevented development on many of these lots. In a few cases the two oceanfront lots are not owned jointly, and the owner of the lot next to the ocean cannot build a house on his lot. According to local realtors, owners could not build on the front lot even without the CAMA setback requirement because of erosion, and therefore the common practice has been for the owner of the oceanfront lot to sell to the purchaser of the second row lot. The CAMA setback requirement presents a problem on only one portion of the beach where a road exists behind the first oceanfront lots. According to the local permit officer, however, it will probably be possible to build on these lots.

According to local officials and realtors, the CAMA regulations have not greatly affected land use or land values at Holden Beach largely because restrictions and standards had been imposed by the town before the CAMA regulations became effective. The town had a 100-foot ocean setback before the CAMA setback was imposed. It also requires a minimum lot size of 5,000

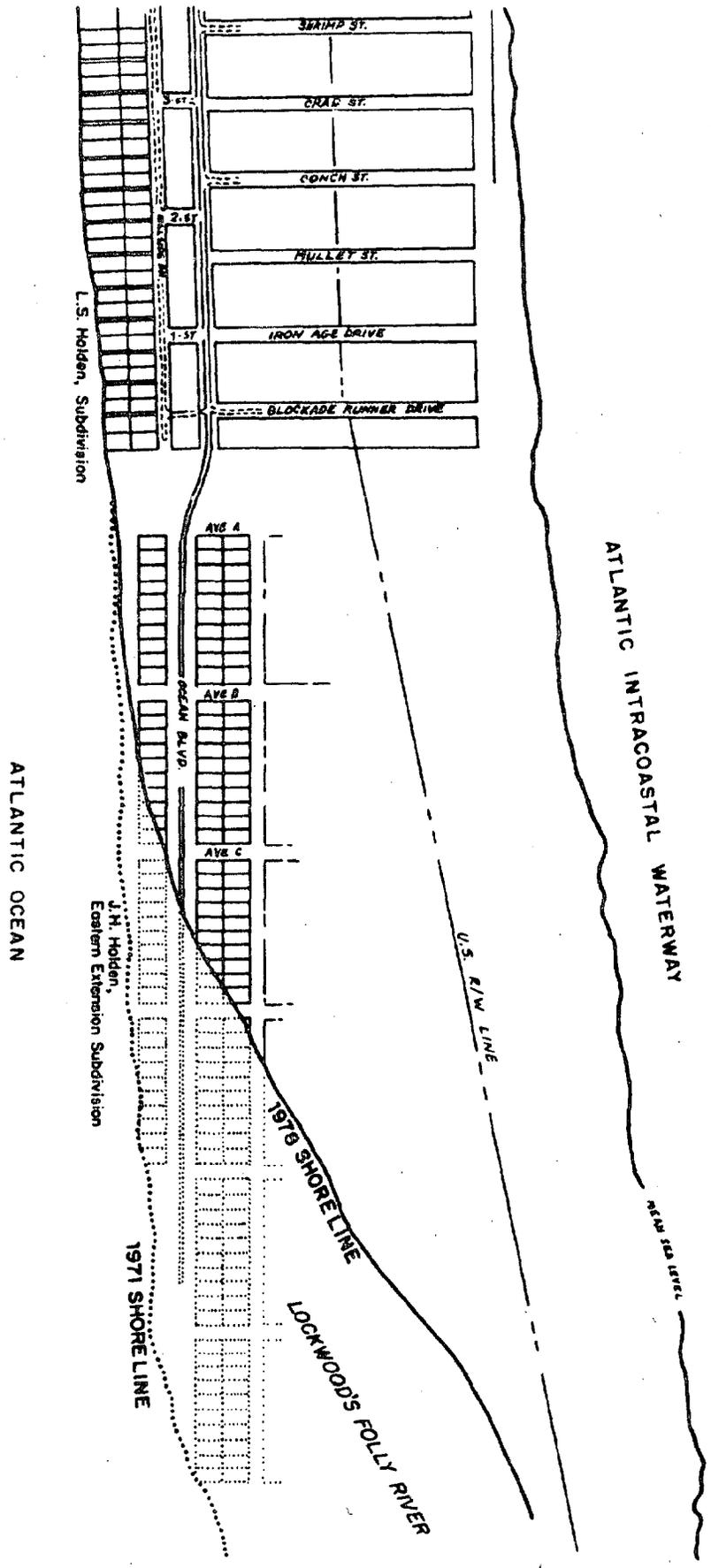


Figure III-2. Erosion in the Inlet Hazard Area at Holden Beach. The J. H. Holden subdivision was platted in 1937. The shoreline is drawn from local zoning maps. A CAMA permit for development of one of the oceanfront lots in the J. H. Holden subdivision was denied (see Holden Beach case #1).

square feet for single-family residences and 7,500 square feet for duplexes. Town building ordinances also require that structures meet state building code standards and flood plain ordinances impose special construction standards; and therefore, except that CAMA standards require 8" pilings, CAMA building code standards do not impose extra requirements. According to the local permit officers, no lots would be denied a permit solely because of CAMA regulations.

Two permits were denied at Holden Beach, both because the applicant failed to meet local ordinances as well as CAMA regulations.

That CAMA regulations have not in general restricted building on the oceanfront is evident in the trend toward larger structures. The average area of oceanfront residences for 1976 through 1979 is as follows:

| <u>Year</u> | <u>Number of residences built</u> | <u>Average floor space in square feet</u> |
|-------------|---------------------------------------|---|
| 1976 | 13 | 1,344 |
| 1977 | 22 | 1,514 |
| 1978 | 12 | 1,864 |
| 1979 | 5 | 2,390 |

Source: Holden Beach building permits.

Since CAMA regulations have not restricted development at Holden Beach, it is unlikely that they have caused any reduction in Ocean Hazard Area property values. This conclusion is supported by local officials and realtors. The town manager, who is also the CAMA permit officer, stated that nothing in the CAMA regulations causes land values to decline. Realtors note that the first oceanfront lots cannot be developed, but they recognize that

these lots could not be developed anyway because of the effects of erosion and local ordinances. Oceanfront property values here, as elsewhere, have increased substantially. According to local realtors, oceanfront lots that sold for \$14,000-\$15,000 thousand before 1974 increased in value to an average of \$22,000 in 1977 and to an average of \$40,000 in 1979.

Local realtors interviewed during the field visit believed that CAMA regulations had not significantly affected land use or land values, and one of them said that regulations are necessary because people will not use "common sense." But they were not entirely satisfied. One realtor believed that property owners should be allowed to protect their property by erosion control measures and that regulations should be more flexible to take into account the varying conditions at different beaches. Another realtor complained about the delay caused by the permit process (in 1979 approval of minor permits required an average of 21 days, which includes the time required to give public notice of the permit application).

In summary, it appears that CAMA regulations have not significantly affected land use and land values in the Ocean Hazard Area of Holden Beach. Local restrictions existed before the CAMA regulations came into effect, and the two permit denials at Holden Beach would have been denied even without CAMA because of local ordinances.

Long Beach. Long Beach occupies more than half of Oak Island, a barrier island just east of Holden Beach. The western end of the island is an Ocean Inlet Hazard Area subject to inlet migration and shoreline erosion. Oceanfront lots near Lockwood Folly Inlet have been subjected to severe erosion. One oceanfront residence had to be moved in 1978 after about 80 feet of oceanfront eroded during a three-month period, leaving the septic tank line

dangling in the air. In the main part of Long Beach from the inlet area to 59th street, the danger to oceanfront property varies considerably, depending on elevation and the condition of dunes. The area from 54th street to 57th street is the site of a former inlet that existed from about 1949 to 1956.²⁹ The CAMA setback for Long Beach west of 58th street is 60 feet, but for Oak Island east of 58th street, an area that includes Yaupon Beach and Caswell Beach, the CAMA setback is 140 feet because the average annual rate of erosion is about 4.5 feet.

In contrast to Holden Beach, where the main road lies behind the second row of oceanfront lots, at Long Beach the main road lies behind the first row of oceanfront lots. Because the oceanfront lots are not very deep, approximately 79 oceanfront lots are undevelopable because of the combined effect of the CAMA setback, which is 60 feet from the first line of vegetation, and the local road setback requirement, which is 30 feet (except in blocks where 25 per cent of the lots have been developed, in which case new residences can line up with existing residences).

The scope of this problem is not yet evident from the number of permit applications. Four permits have been denied, but in each case a residence of different dimensions could be built on the lot. In fact, in one case a fairly large residence has been built (the ocean-side porch was cantilevered over the setback line). But construction would not be feasible on the 79 lots identified by local officials. One owner has already requested and received a lower property tax valuation, from \$12,500 to \$500, because of the setback requirement, and the town faces the prospect that other owners will request a lower valuation.

While at many places along the coast the need for the CAMA setback seems obvious, the situation at Long Beach raises questions about the uniform application of the setback requirement at this location. First, along much of the developed beach at Long Beach the rate of erosion has been fairly moderate--although, as noted above, there is evidence of severe erosion on some parts of the beach and considerable danger from major storms at certain locations. Second, the 79 lots are interspersed among lots with existing residences. Even if residences already exist on both sides, owners of these lots are not permitted to build on them even if they are aware of the dangers from erosion and storm damage and are willing to accept the risks of damage or destruction. More houses probably would not exacerbate the problems of beach encroachment caused by existing residences unless the owners were allowed to protect them by building seawalls or bulkheads. Under existing CAMA standards houses built after June 1, 1979, cannot be protected by bulkheads (bulkheads can be built as an emergency measure to protect residences built before that date if the erosion scarp is within 20 feet of foundation pilings or septic tank lines). Third, a relatively slight relaxation of the CAMA setback might permit construction of residences that might be no closer to the ocean than existing houses.

In contrast to the developed area of Long Beach, the area just east of 58th street was undeveloped until recently, when construction began on a new subdivision. Houses in this subdivision line must be set back 140 feet instead of 60 feet, but this requirement does not prohibit development because lots and roads were laid out to meet the CAMA requirements.

Emerald Isle. Emerald Isle is an 11-mile-long beach community on the western end of Bogue Banks in Carteret County. Part of the island here is

considered relatively safe for development because of high elevation, high protective dunes, and moderate erosion. The western end, however, is susceptible to eastward migration of Bogue Inlet, severe erosion, and shifting dunes. The narrow part of the island west of Indian Beach West is regarded as a relatively poor area for development³⁰ because here the island is low and narrow and lacks protective dunes. The area is considered to be vulnerable to inlet formation and storm-flooding and overwash, which has in fact occurred during previous major storms.

CAMA regulations have not had a significant effect on oceanfront development at Emerald Isle. Two of the 35 permit applications were denied, but neither denial was prohibitive. In one case the lot on which the applicant wanted to build a duplex was such that part of the dune would have had to be removed to provide an adequate area for two septic tank fields. Except for CAMA regulations, the owner would have been able to bulldoze sand from the dune in order to accomplish this purpose (the town had a dune ordinance, which is to be replaced by CAMA dune regulations; however, the CAMA regulations apply only to the Ocean Hazard Area, while the town ordinance applied to all dunes). The owner could have built a single-family residence on his lot, and therefore the market value for the lot was probably not much affected by the denial for a duplex. The second denial was for a proposed bulkhead in front of a single-family residence where the rate of erosion was moderate. The application was denied after owners of the adjacent property objected that the bulkhead was not needed and might cause erosion on their property.

Local officials and realtors generally agree that CAMA regulations have not significantly affected land use or land values at Emerald Isle. Although

the earliest lots were usually only 150 feet deep, in developing areas lots are 250 to 350 feet deep and are protected by high dunes. The local permit officer says that there is little conflict over CAMA regulations now and that people are used to the regulations and generally accept them. One realtor stated that CAMA regulations have "not affected values at all." (Oceanfront lots sell for an average of about \$40,000 compared with less than \$20,000 four years ago). He also believes that CAMA regulations do not significantly increase costs of construction, although he questions the need to place pilings four feet below mean sea level when a structure is being built on a high dune. This realtor also believes that CAMA has had a positive effect by stopping the practice of flattening dunes and leveling trees; and that CAMA has caused people to change their thinking about development. He says that people do not want bare, flat lots and that good development practices fostered by CAMA regulations enhance values and improve land.

Pine Knoll Shores. Pine Knoll Shores, located on Bogue Banks, contains beach areas that are regarded as relatively safe for development.³¹ The dune line is fairly continuous, the dunes and the general elevation are high, and maritime forests have been preserved. Pine Knoll Shores is substantially different from most developed areas on the coast. The land was held in an undeveloped state for several decades by the Roosevelt family, and it has been developed in an orderly fashion by professional developers retained by the family. Pine Knoll Shore is essentially a planned community, and standards have been imposed and maintained to insure sound development.

CAMA regulations have had little or no effect at Pine Knoll Shores because more stringent local requirements had been imposed earlier. For example, the local setback regulation is 100 feet, whereas the CAMA setback is

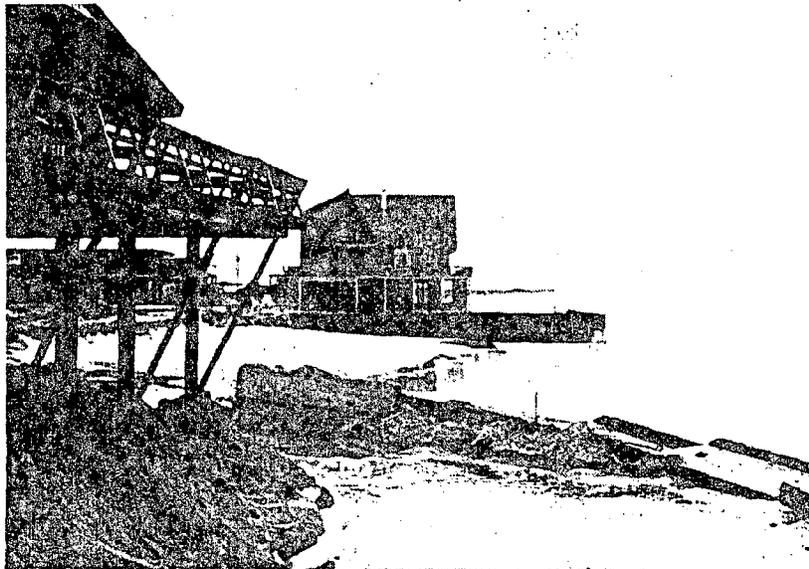
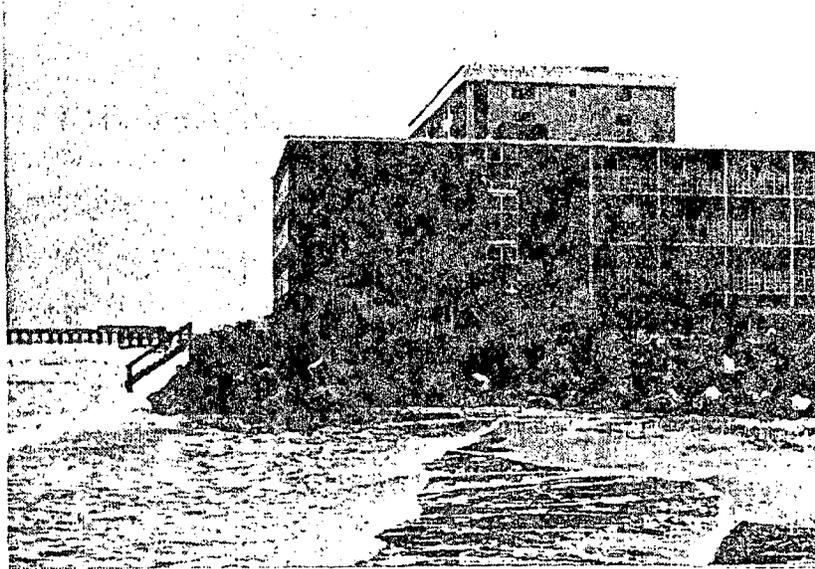
only 60 feet. Because the Ocean Hazard AEC is only 60 feet deep in most places, CAMA permits are required only for walkways and decks built over the dunes within the AEC (and generally these are exempt), not for residences and structures placed behind the CAMA setback line.

Wrightsville Beach. Wrightsville Beach is a heavily developed beach community that has had chronic problems of beach erosion. It contains one dramatic example of the consequences of building oceanfront structures in areas susceptible to erosion.

A series of measures have been taken to correct the effects of chronic erosion. In 1962 an artificial berm was constructed; in 1965 nearly 3 million cubic yards of sand were pumped onto the beach; and the beach was "nourished," or replenished with sand, again in 1966 and 1970.³² In 1976 sand was bulldozed from artificial dunes to flatten the steep beach, but in 1977 the beach was again steep and an escarpment had formed.³³ During February 1980 local officials estimated that 30 to 40 feet of the protective berm had eroded since August of 1979. A new beach-restoration project is now under way that--at a cost of \$2.5 million in federal, state, and local funds--will replace the sand and rebuild the protective berm.

Before 1965, Wrightsville Beach and Shell Island were separated by Moore's Inlet. The inlet was filled by man in 1965, and about 1967 a Holiday Inn was built on the oceanfront. Local officials estimate that at that time 200 to 300 feet of sand stretched between the building and the beach. Today waves pass beyond the seawall in front of the building, and rip-rap (rocks used as a seawall) has been placed in front of the seawall to slow erosion. Several residences were built on the oceanfront lots northeast of the Holiday Inn during the late 1970s. Their owners have since constructed expensive

bulkheads and added rip-rap. During normal high tides the surf passes around the bulkheads, and the beach becomes impassable unless one walks through the surf or behind the residences. Some undeveloped lots nearby have been eroded almost completely away.



An example of beach encroachment--the Holiday Inn and nearby residences at Wrightsville Beach.

Despite the chronic erosion problems at Wrightsville Beach, CAMA regulations have not had a significant impact on land use in the Ocean Hazard AEC. The CAMA setback regulation has not affected development significantly because most lots have been developed and because, as a condition imposed by the Corps of Engineers for the berm project of 1962, the town agreed to incorporate a building-setback line (which varies in depth according to zones). About 11 oceanfront lots cannot be developed to meet the CAMA setback regulation and local ordinances, but they are in the section near the Holiday Inn where erosion has been especially severe, so they would probably not be developed anyway. A development of 19 homes that was to be built on a tract of land near the Holiday Inn had to be scaled down--two or three homes were eliminated--as a result of the CAMA setback regulation, but recent erosion and overwash during Hurricane David suggest that scaling-down would have been advisable anyway, and the value of the land was probably not affected significantly.

Thus, while there are chronic erosion problems at Wrightsville Beach, periodic beach-restoration projects and an existing setback line have--for the time being at least--protected oceanfront property except in the area where Moore's Inlet was located, and losses in property values there cannot be attributed to CAMA.

Nags Head and Kill Devil Hills. Nags Head and Kill Devil Hills occupy the southern end of Currituck Banks from Kitty Hawk south to the Cape Hatteras National Seashore. While the erosion rate for much of the beach is regarded as moderate (see Fig. III-3), two areas had serious erosion problems. As Fig. III-3 shows, the erosion rate is worse toward the south end of the island because of the proximity of Oregon Inlet.

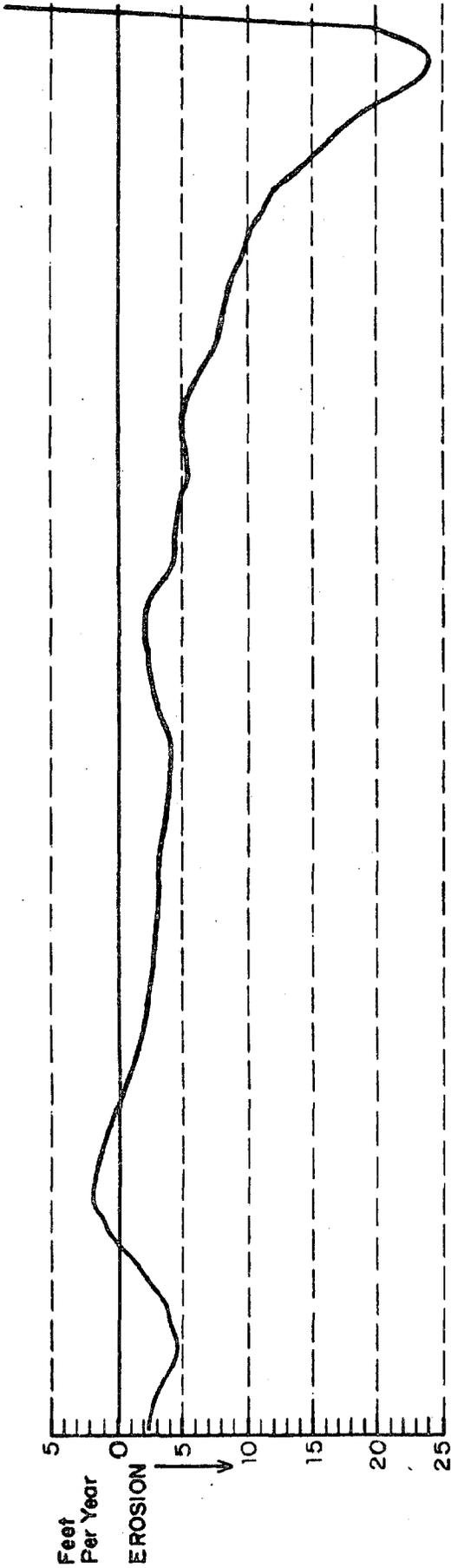


Several homes were moved away from the ocean at this location in Nags Head after the escarpment eroded about 20 feet during the 1979-80 winter.

One of the most dramatic illustrations of the effects of erosion on oceanfront development occurs at the southern boundary of Nags Head. In February 1980, several of the houses had to be moved away from the ocean (at the expense of the federal flood plain insurance program) after about 20 feet of a steep escarpment had eroded in front of them (one owner had bought his residence within the previous year). One of these residences is a well-known landmark because it consists of several white geodesic domes. Photos of the house taken around 1969 show several hundred feet

of sand in front of it. In February 1980 it was propped up over a 15-foot escarpment with part of the structure gone and pipes dangling in the air (see photo).

The other problem area is in the northern section of Kill Devil Hills (it extends into Kitty Hawk). Here the high erosion rate has severely narrowed the oceanfront lots, which are bordered by a road. Some homes in this area have been destroyed during previous storms, some have been moved, and evidence of erosion and overwash exists all along this stretch. In February 1980, the beach was littered with exposed septic tanks, cisterns, and remnants of destroyed bulkheads. Recent overwash beyond the first row of houses was evident.



ATLANTIC

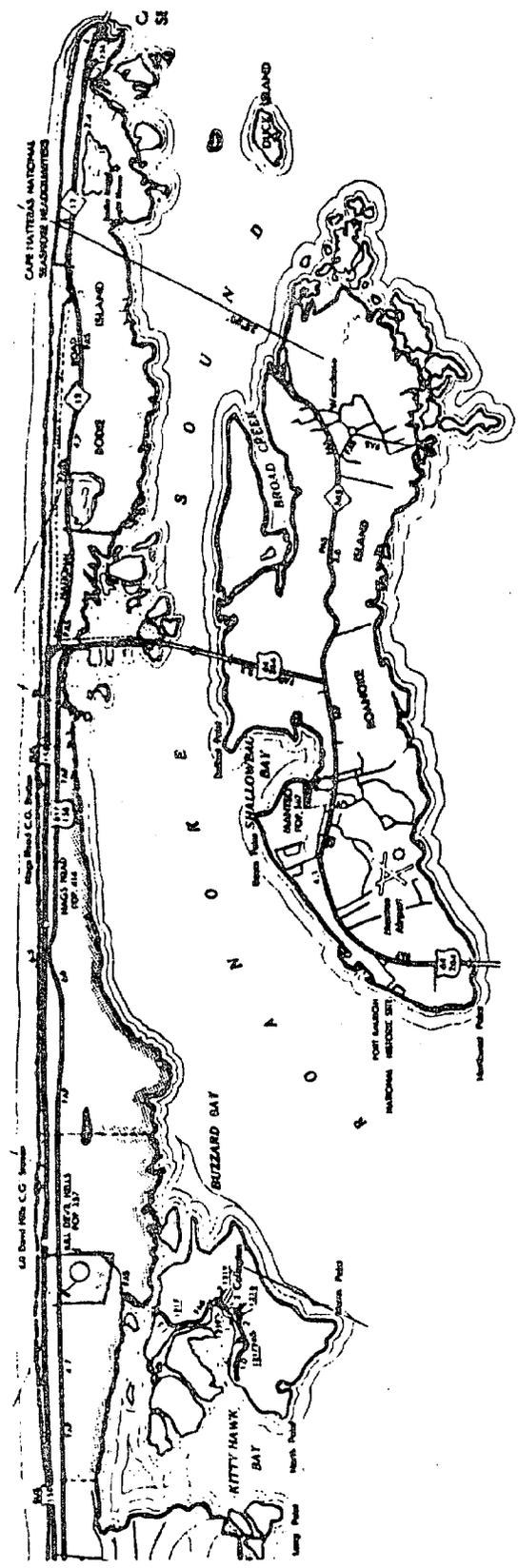


Figure III-3. Variation in the average annual rate of erosion at Nags Head and Kill Devis Hills. Robert Dolan, Bruce Haden, and John Haywood, "A New Photogrammatic Method for Determining Shoreline Erosion," Coastal Engineering, Vol. II (1978), pp. 21-39.

Despite erosion problems, CAMA regulations so far have not significantly affected development in Nags Head. None of the 50 minor permit applications there have been denied. No oceanfront lots in Nags Head are undevelopable because of CAMA regulations.

Nags Head contains one notable example of the positive effects of CAMA regulations. The Chawanook Subdivision, an oceanfront residential development, was designed to meet CAMA regulations. The developers curved the road inland to provide deeper oceanfront lots, built common walkways over the dunes before construction of houses began, and, with the help of the local permit officer, incorporated a setback line for the oceanfront lots that would place all of the residences in the subdivision well behind residences on the adjacent property, which are very near the ocean.

In the northern part of Kill Devil Hills (and in Kitty Hawk), the CAMA setback requirement prohibits development on many narrow oceanfront lots that have been eroded. The local permit officer estimated that of approximately 78 vacant oceanfront lots in Kill Devil Hills, 28 are undevelopable because of the combination of the CAMA setback requirement and a local requirement that structures be set back 10 feet from the road right-of-way. (Kitty Hawk has many more lots like this.) One application for construction of a single-family residence on a lot in this area has been denied. A house that previously existed on the lot has been moved. Even measuring the depth of this lot is difficult because it seems to be part of the beach. Local realtors conceded that this lot and others like it were not safe for development and should not be built on.

The issues involved in the use of the CAMA setback in this area of the beach are considerably different from those found in Long Beach, where the

setback regulations also prohibit development on vacant lots in an already-developed area. Data on erosion and casual observation suggest that building residences on some of these lots would be very risky, perhaps foolhardy, at this part of Kill Devil Hills, whereas many of the lots at Long Beach seem comparatively safe from erosion. The existing houses at Long Beach are not in imminent danger from erosion or overwash, whereas at least some of those in Kill Devil Hills are vulnerable to storm damage and are already being undermined and threatened.

3. Minor Permit Denials in Other Ocean Hazard AECs. During the first year the CAMA minor permit program was in effect (March 1, 1978, to February 28, 1979), 14 out of a total of 707 applications for minor permits in both Ocean Hazard and Estuarine System AECs were denied--a denial rate of 2 per cent. Eleven of the denials were in Ocean Hazard AECs; three were in Estuarine System AECs. During the second year (March 1, 1979, to February 29, 1980), 10 of a total of 239 applications for minor permits in Ocean Hazard AECs were denied--a denial rate of 5 per cent. For the second year, 30 of a total of 825 applications for both Ocean Hazard and Estuarine System AECs were denied--a denial rate of 3.6 per cent.

Following are brief summaries of some denial cases in Ocean Hazard AECs outside the beach communities selected for this study (the case descriptions are based on appeals records).

Surf City Denial. The applicant was denied a permit to build an oceanfront residence 42 feet wide by 28 feet deep. The proposed structure would have been built in front of the only dune high enough and continuous enough to provide protection against the ocean; the foundation would have been

18 feet from the first line of vegetation. The permit was denied before the CAMA setback became effective.

Caswell Beach Denial. The applicant was denied a permit to build an oceanfront residence 24 feet deep on a lot that measured 102 feet from the first line of vegetation to the rear property line. Since the average erosion rate in this area is 4.7 feet per year, the CAMA setback was 140 feet from the first line of vegetation, and therefore no building on this lot could meet CAMA regulations.

Kitty Hawk Denial #1. The applicant was denied a permit to build an oceanfront residence on a lot that contained only 86 feet of land behind the forward edges of the frontal dune. Since the CAMA setback is 103 feet at this location, no construction would meet the CAMA setback requirement. In addition, the dune would have to be disturbed to build the proposed septic tank.

Kitty Hawk Denial #2. The applicant was denied a permit to build an oceanfront residence 24 feet deep on a lot that had no frontal dune and measured only 32 feet from the first line of vegetation to the rear property line. Because the CAMA setback here is 78 feet and the local street setback is 15 feet, no development is feasible on this site. Remains of a wood bulkhead suggests that a structure once existed on this lot.

Seahaven Beach Denial #1. The applicant proposed to build an oceanfront residence 24 feet deep on a lot with no primary dune and to build a bulkhead behind the oceanward row of pilings. The distance from the first line of vegetation to the rear property line is 64 feet. The CAMA setback is 60 feet, and Onslow County requires a 30-foot setback from the road right-of-way. Construction on this lot is not feasible under these regulations.

Seahaven Beach Denial #2. This case was essentially identical to Seahaven Beach Denial #1.

Seahaven Beach Denial #3. The applicant proposed to build an oceanfront residence 24 feet deep on 2 lots. The distance from the first line of vegetation to the structure would have been 33 feet, and the distance from the rear of the house to the road right-of-way would have been 15 feet; the proposed structure was therefore inconsistent with the 60-foot CAMA setback requirement and the Onslow County 30-foot road setback.

4. Lots Potentially Restricted by the Combination of the CAMA setback regulation and local zoning ordinances. During January and February of 1980, the staff of the Office of Coastal Management, at the request of the Coastal Resources Commission, tried to identify the platted oceanfront lots along the entire North Carolina coast that are too small to be consistent with both the CAMA setback requirement and the local street or road setbacks contained in local zoning ordinances. The identification was made by examining aerial photos and zoning maps, consulting with local permit officers, and making field visits. A lot was considered too small to develop if the CAMA setback, which is determined by multiplying the annual erosion rate by 30 and is measured from the first line of vegetation, and local street or road setbacks left less than 20 feet for building of a structure.

That these lots are identified in this manner as "too small to develop" cannot be attributed to CAMA alone. Some of them are in areas where severe and chronic erosion may make development extremely risky, if not foolhardy. This is possibly the case in some parts of southern Kitty Hawk and northern Kill Devil Hills, in the eastern end of Holden Beach, and in Yaupon Beach--all

areas where CAMA permits have been denied. Even though some people have proposed to develop lots in these areas, many lots would probably remain undeveloped even if CAMA did not exist because of the high risks involved. In other cases local street or road setback requirements alone would force structures too near the water, or minimum lot-size requirements would make the lots undevelopable under local ordinances (as happened in Holden Beach Denial #1).

The estimate of the number of lots too small to develop under CAMA and local setback requirements appears in Table III-3 for each beach area. The estimate is that from 458 to 511 lots, out of a total of 3,028--are undevelopable. Almost 200, or about 39 per cent, of the total number of lots are on the one stretch of beach in Kill Devil Hills and Kitty Hawk where two CAMA permits have been denied. About 370, or 75 per cent, of the total number are in that area and in three other problem areas--West Onslow Beach, Long Beach, and the inlet area at the eastern end of Ocean Isle. Other lots are in special problem areas like the stretch near the Holiday Inn at Wrightsville Beach, Yaupon beach (where erosion has destroyed several rows of oceanfront lots), and the eastern end of Holden Beach near Lockwood Folly Inlet (where many platted lots are now covered with water).

It is difficult to use these estimates to evaluate the effects of CAMA regulations on land values. First, many of the lots would have a very low market value because their size has been reduced by erosion and because of the inherent risks attributable to high erosion rates. As in Holden Beach Denial #1, some lots have been assessed for property taxation as underwater lots. Second, to evaluate the effect of the CAMA setback on land values, it must be determined whether a lot would be undevelopable even without the CAMA setback because of restrictions imposed by local ordinances.

On the other hand, some of the lots do have a significant market value and could be developed successfully (though at some risk) if it were not for the CAMA setback requirement. This is true at Long Beach, where--at least on most of the oceanfront--erosion has been moderate and people have been willing to buy lots and build on them. Most of the problem lots at Long Beach are assessed at \$12,000 to \$15,000 each, though their market value is considerably higher--perhaps \$35,000 to \$40,000. The assessed valuation of the one lot that does not meet the CAMA setback requirement has been reduced to only \$500.

5. CAMA Major Permits and Dredge and Fill Permits in Ocean Hazard AECs.

During the first 1 3/4 years of the CAMA permit program, only three CAMA permits for major development were issued for the seven beach communities selected for analysis.³⁴ There were no denials. A permit was issued for the Town of Holden Beach to lay a water pipeline across Lockwood Folly Inlet to Ocean Isle. Two permits were issued for projects at Nags Head--one for bulldozing sand on the beach and one for an oceanfront hotel. Only the hotel did not also require a federal permit.

There were, however, denials in Ocean Hazard AECs of Brunswick County. The same applicant was denied two permits to build seawalls at Yaupon Beach, where there has been chronic and severe erosion. The average rate of erosion there is 5.7 feet per year, but the beach has apparently been eroding 12 feet per year at this site. The pilings of a completed residence were only 26 feet from a four-foot-high scarp, and pilings of an incomplete residence on an adjacent lot were only 17 feet from a five-foot-high scarp.

Table III-3

Oceanfront Lots Potentially Undevelopable Because of a Combination of
Erosion, the CAMA Setback Regulation, and Local Setback Ordinances

| <u>Beach</u> | <u>Estimated number of lots potentially undevelopable¹</u> | <u>Estimated total number of undeveloped lots</u> |
|------------------------|---|---|
| Southern Shores | 0 | 37 |
| Kitty Hawk | 166 | 180 |
| Kill Devil Hills | 28 | 60 |
| Nags Head | 0 | 300 |
| Rodanthe, Waves, Salvo | 0 | 23 |
| Avon | 0 | 64 |
| Buxton | 1 | 1 |
| Frisco, Hatteras | 0 | 0 |
| Atlantic | 3 | 5 |
| Pine Knoll Shores | 0 | 82 |
| Emerald Isle | 0 | 50 |
| West Onslow | 55-66 | 100 |
| Surf City | 15 | 464 |
| Topsail | 21-40 | 430 |
| Wrightsville | 11 | 30 |
| Carolina | 0 | 75 |
| Wilmington, Hanaby | 5-12 | NA |
| Kure | 2-5 | 18 |
| Yaupon | 10 | 38 |
| Long | 79 | 266 |
| Caswell | 5-8 | 8 |
| Holden | 30 | 275 |
| Ocean Isle | 34-45 | 299 |
| Sunset | 2 | 67 |
| Figure 8 | <u>0</u> | <u>150</u> |
| Totals | 458 to 511 | 3,028 |

1. A lot was considered to be undevelopable if the combination of the CAMA setback requirement and local street or road setbacks left a depth of less than 20 feet for construction.

Source: Survey in Winter 1980 by staff members of the Office of Coastal Management based on aerial photos, maps, consultation with local permit officers, and field visits.

FOOTNOTES

1. A good introduction to these subjects is Orrin H. Pilkey, Jr., William J. Neal, and Orrin H. Pilkey, Sr., From Currituck to Calabash: Living with North Carolina's Barrier Islands (Research Triangle Park, N.C.: North Carolina Science and Technology Research Center, 1978).
2. Stephen V. Shabica, Shoreline Changes at Cape Hatteras Natural Seashore, 1937-77 (Resources Management Report No. 27, Natural Park Service, Coastal Field Research Laboratory, NSTL Station, Mississippi, November 1978), p. 5.
3. Robert Dolan, Bruce Hayden, Cary Rea, and Jeffrey Heywood, "Shoreline Erosion Rates Along the Middle Atlantic Coast of the United States," Geology, 7 (December, 1979), 605.
4. Pilkey, et al., From Currituck to Calabash, p. 21.
5. Robert Dolan, Bruce Hayden and Jeffrey Heywood, "Shoreline Forms and Shoreline Dynamics," Science, 197 (July, 1977), 51.
6. Pilkey, et al., From Currituck to Calabash, p. 56.
7. Ibid., p. 45.
8. Ibid., p. 43.
9. National Park Service, Statement for Management, Cape Hatteras National Seashore (January, 1978).
10. Pilkey, et al., From Currituck to Calabash, p. 97.
11. 15 N.C.A.C. 7H.0301.
12. Id.
13. Id. 7H.0304.
14. N.C. Gen. Stat. § 113A-102(b)(1).
15. Id. § 113A-1029b)(4).

16. Id. § 113A-113(b)(6).
17. 15 N.C.A.C. 7H.0306(b).
18. 15 NCAC 7H.0306(a)(1).
19. Id. 7H.0308(a)(2).
20. Id. 7H.0308(a)(7).
21. Id. 7H.0308(a)(3).
22. Id. 7H.0308(b).
23. Id. 7H.0308(d).
24. Id. 7H.0306(c).
25. Id. 7H.0509-.0510.
26. Id. 7H.0306(h).
27. Id. 7H.0308(d)(10).
28. Pilkey, et al., From Currituck to Calabash, p. 109.
29. Ibid., p. 109.
30. Ibid., p. 87.
31. Ibid., p. 84.
32. Ibid., p. 40; also based on interviews with local officials.
33. Ibid., p. 40. See the photo on p. 41.
34. Only five major permits for development in Ocean Hazard AECs were issued or denied in the entire state during the first thirteen months of the CAMA permit program (see Table IV-2).

IV. REGULATION IN THE ESTUARINE SYSTEM AECs

The Coastal Resources Commission has designated four types of estuarine system AECs--Estuarine Waters, Coastal Wetlands, Public Trust Areas, and the Estuarine Shoreline. Public Trust Areas include estuarine waters and certain inland waters. Regulation of land use involves primarily the Estuarine Shoreline AEC and the Coastal Wetland AEC (because land use involves bulkheads, channel excavation, boat ramps, piers, docks, and jetties that extend into the wetlands), and therefore this study is limited to an analysis of regulation in these two AECs.

A. CAMA Regulation in Estuarine Shoreline AECs

The Estuarine Shoreline was designated an AEC because it is considered to be a component of the estuarine system and because development on the shoreline "influences the quality of estuarine life and is subject to the damaging processes of shore front erosion and flooding."¹ The Estuarine Shoreline is delineated as the area within 75 feet of the mean high-water level or the normal water level along the estuaries, sounds, bays, and brackish waters.

Use standards for the Estuarine Shoreline AECs provide that development must not have a significant adverse impact on estuarine resources. Development must "substantially preserve" and not weaken or eliminate natural barriers to erosion (such as peat marshland, resistant clay shorelines, and cypress-gum protective fringe areas).² Areas covered by impervious surfaces must be minimized and limited to 30 per cent of the lot's area within the AEC.³ Development must conform to standards under the North Carolina Sedimentation Pollution Control Act; these include provisions for a buffer zone around land-disturbing development, limits on graded slopes, and revegetation of disturbed land.⁴ Development must not significantly interfere with existing public access rights or use of navigable waters or public resources,⁵ and major public facilities are not permitted if they are likely to require excessive public expenditures for maintenance and continued use.⁶ Development may not cause major or irreversible damage to valuable, documented historic architectural or archaeological resources.⁷

B. CAMA Regulations for Coastal Wetlands AECs

Marshes that are subject to regular or occasional flooding by tides have been designated as areas of environmental concern because they provide decayed plant materials and nutrients that form the basis for the food chain in the estuaries, they provide nesting and feeding areas for waterfowl and wildlife, they serve as a buffer against shoreline erosion, and they serve as nutrient and sediment traps.⁸ The Coastal Resources Commission has assigned the highest priority of land use to "the protection and management of coastal wetlands so as to safeguard and perpetuate their biological, social, economic and aesthetic values."⁹

General-use standards allow only water-dependent uses in coastal wetlands, estuarine waters, and public trust waters. Restaurants, residences, apartments, motels, hotels, trailer parks, private roads, factories, and parking lots, for example, are not permitted, while utility easements, docks, wharfs, boat ramps, dredging, bridges, revetments, bulkheads, culverts, groins, navigational aids, mooring pilings, navigational channels, access channels, and drainage ditches are permitted if they meet all appropriate standards and regulations.¹⁰ To receive a permit, a project must be consistent with the Coastal Resources Commission management objective for coastal wetlands. There must be no suitable alternative site outside the AEC. The project must not violate water and air quality standards, measurably increase siltation, create stagnant water bodies, impede navigation or create undue interference with access to or use of public trust or estuarine waters, or cause major or irreversible damage to valuable documented archaeological or historic resources. Timing of the development must be such as to have a minimum adverse effect on life cycles of estuarine resources. And a combination of site and design must be chosen that will have a minimum adverse effect on the productivity and biological integrity of coastal marshland, shellfish beds, submerged grass beds, spawning and nursery areas, important nesting and wintering sites for waterfowl and wildlife, and important erosion boundaries.¹¹ Specific-use standards apply to various types of development in Coastal Wetlands, Estuarine Waters, and Public Trust Areas:¹²

Navigational Channels, Canals, and Boat Basins. These must be located and aligned to avoid highly productive shellfish beds, beds of submerged vegetation, and regularly or irregularly flooded marshes.

Hydraulic Dredging. The terminal end of a dredge pipeline must be at least 50 feet from a containment dike and a maximum distance from spillways in order to allow adequate settlement of suspended solids. Excavated material must be confined on high ground by adequate retaining structures and stabilization measures. Effluent from diked areas in which excavated materials are being placed must be returned to the area being dredged, if possible, or contained and directed to a point waterward of emergent vegetation, or, when conditions require it, below mean low water. Dredge spoil and effluent from dredging in closed shellfish waters must be returned to these waters.

Drainage Ditches. Ditches must not be more than six feet wide and four feet deep unless necessary for adequate drainage; only ditches larger than this are subject to regulations. Spoil from ditches through regularly flooded marshes must be placed landward of these marshes in a manner that will insure that sediment will not enter the water or marsh; spoil from irregularly flooded marshes must be placed on non-wetlands whenever this is feasible. When new ditches are excavated through high ground, an earthen plug or other method must be used to minimize siltation to adjacent water bodies. Ditches must not adversely affect officially designated primary nursery areas, productive shellfish beds, submerged grass beds, or other important documented estuarine habitats.

Nonagricultural Drainage. Ditches must be designed to minimize the volume of flow to surface and ground water and to provide for passage of

migratory organisms. They must not create stagnant water pools or significant changes in velocity of flow or divert or restrict water flow to important wetlands or marine habitats.

Marinas. Marinas must be in areas that do not require dredging (except for dredging necessary for access to high-ground sites) and must not disturb valuable shallow water and wetlands habitats. Marinas must be designed to minimize use of public waters, must provide adequate wastewater pump-out stations, and must use necessary means to minimize pollution and adverse effects on navigation and public use of waters.

Docks and Piers. Docks and piers must not significantly interfere with waterflows, present a navigational hazard, or extend more than 80 feet from a federally maintained channel. To minimize shading of marsh vegetation, piers and docks over vegetated marshes must not be more than six feet wide and platforms on the end must not exceed 500 square feet.

Bulkheads and Other Shore Stabilization Measures. Bulkheads must be placed approximately at the mean high-water level or normal-water level and must be landward of significant marshland or marshland fringes. Bulkhead fill material must be obtained from an upland source unless the bulkhead is part of a permitted project that involves excavation from a non-upland source. Bulkheads built below the mean high-water level or the normal water level to reclaim land lost to erosion are limited to the area lost to erosion in the year before a permit was applied for.

C. Evaluation of the Effects of CAMA Regulations on Land Use in the Estuarine System AECs

To evaluate the effects of CAMA regulations on land use and land values in the estuarine system AECs, an analysis was made of regulatory decisions on

CAMA permit applications for minor and major development (including dredge and fill operations) in selected areas from March 1, 1978, the date the CAMA permit program became effective, to November 30, 1979. The analysis of minor permits involved all permit applications filed in the seven beach communities selected for analysis of Ocean Hazard AEC permits--that is, in Kill Devil Hills, Nags Head, Pine Knoll Shores, Emerald Isle, Wrightsville Beach, Long Beach, and Holden Beach--plus the permit applications filed in Beaufort and Brunswick counties. In regard to major permits, all applications filed in Beaufort and Brunswick counties during the same period were analyzed.

1. Analysis of CAMA Minor Permit Decisions. For the entire coastal region, 980 permits for minor development in estuarine shoreline and wetland AECs were granted during the first two years of the CAMA permit program (March 1, 1978, to February 29, 1980). During the same period 293 permits were granted or denied in the selected areas. Thus the selected areas accounted for 29.9 per cent of the estuarine system AEC minor permits during the first two years of the program. Of the 980 minor permit applications for the entire coastal areas, only seven were denied. Data on the number of conditional permits granted during the first year are not available, but in the second year 41 conditional permits, or 9.3 per cent of the total, were issued.

In the areas selected for detailed analysis, 260 applications for permits were filed during the first 1 3/4 years of the permit program. Of this total, 248 (95.4 per cent) were approved, 11 (4.2 per cent) were granted with conditions, and one (0.4 per cent) was denied. As in the analysis of Ocean Hazard AEC permits, permits were classified as conditional permits only when the conditions did not merely restate CAMA regulations. Table IV-1 shows the

type of activities or structures covered by the permits. In the beach communities over three-quarters of the permits involved residences. In the two counties most of the permits covered residences (24.5 per cent), bulkheads (28.4 per cent), or piers, docks, boathouses, or walkways (22.8 per cent).

The one denial involved a proposed residence of over 4,000 square feet on inland waters at Wrightsville Beach. The proposed development violated the standard that no more than 30 per cent of the lot be covered with impermeable surfaces, but the permit was denied also on grounds that the size of the house violated local zoning ordinances. The applicant reapplied for a permit to build a somewhat smaller house with a smaller paved driveway, and a large residence now exists on the lot.

Since conditions attached to permits can possibly affect use of land, the conditions attached to the eleven conditional permits were reviewed (only true conditions, rather than restatements of standards, were considered). Five of the eleven conditional permits involved townhouses to be built by one developer. The conditions for these permits required the developer to take certain measures during construction in order to prevent erosion and siltation. In two cases involving single-family residences, one applicant was required to raise the elevation of the lots to 7.5 feet above mean sea level, in accordance with local flood plain regulations, and the other applicant was required to revise the site plan to conform to local side setbacks. A condition placed on another application for a permit to build a single-family residence was that a bulkhead be constructed. The condition in still another single-family case was that an existing bulkhead be corrected to eliminate siltation. In another case a buffer zone was required between a mobile home foundation and marsh grass, and in the last case a buffer zone was required between a road fill and marsh grass.

Table IV-1

Type of Activity or Structure Covered by Minor Permits
in Estuarine System AECs in Selected Areas

| <u>Type of activity or structure</u> | <u>Seven beach communities</u> | | <u>Beaufort and Brunswick counties</u> | |
|--------------------------------------|--------------------------------|-------------------|--|-------------------|
| | <u>Number</u> | <u>Percentage</u> | <u>Number</u> | <u>Percentage</u> |
| Residences: | | | | |
| Single-family | 114 | 72.2% | 25 | 24.5% |
| Duplex | 1 | 0.1 | -- | -- |
| Multiple units | 6 | 3.8 | -- | -- |
| Remodeling | 1 | 0.1 | -- | -- |
| Additions | 1 | 0.1 | -- | -- |
| Bulkheads | 8 | 5.1 | 29 | 28.4 |
| Piers, docks, boathouses, walks | 18 | 11.4 | 23 | 22.5 |
| Commercial structures | 4 | 2.5 | 2 | 2.0 |
| Boat ramps | -- | -- | 3 | 2.9 |
| Jetties and breakwaters | -- | -- | 11 | 10.8 |
| Road repair | -- | -- | 2 | 2.0 |
| Filling | -- | -- | 1 | 1.0 |
| Marinas | -- | -- | 1 | 1.0 |
| Marine railways | -- | -- | 1 | 1.0 |
| Golf courses | -- | -- | 1 | 1.0 |
| Boat storage shed | -- | -- | 1 | 1.0 |
| Enlarge canal | -- | -- | 1 | 1.0 |
| Other | 5 | 3.2 | 1 | 1.0 |
| | <u>158</u> | <u>100.0%</u> | <u>102</u> | <u>100.0%</u> |

2. Analysis of CAMA Major Permits and Dredge and Fill Permits. The primary objective of this study was to estimate the impact of CAMA regulations and the Dredge and Fill Law on land use and land values in coastal areas. In the estuarine system AECs, almost every project that requires a state permit also requires a permit from the Corps of Engineers under authority either of Section 10 of the Rivers and Harbors Act of 1899 or Section 404 of the Clean Water Act of 1977 (see Chapter II, Section A.1.). As Chapter II pointed out, the state and federal permit programs are closely related. Applications for both state and federal permits are made on the same forms, and state and federal staff members make field inspections together and consult regularly. Under Section 307 of the Federal Coastal Zone Management Act, a federal permit cannot be issued unless the state certifies that the proposed project is consistent with the state coastal management program and state policies; in practice, the state certifies projects as consistent if they are eligible for a state permit.

Although federal permits are therefore contingent on the state's approval of a permit, federal criteria for evaluating permit applications are broader and potentially more restrictive. The state can deny a permit only if it shows that the proposed project will have an adverse effect, while the Corps of Engineers may deny a permit if it finds that the project is not in the public interest. For example, if the Corps evaluates the expected benefits to the public, it may deny a permit if there is an alternative "upland" site suitable for the project. The Corps' geographical jurisdiction extends beyond the state's jurisdiction, which is limited to the AECs. Thus the Corps may deny permits that the state cannot deny. In practice this is done very

infrequently, and in most cases a project that qualifies for a state permit will also qualify for a federal permit. But, if CAMA had not been enacted, almost all projects in the estuarine system AECs that require state permits under CAMA and the Dredge and Fill Law would still be required to have a Section 10 or Section 404 permit.

Data are not available on the total number of CAMA major permits (including dredge and fill permits) issued or denied for development in estuarine system AECs. However, Table IV-2 shows the number of estuarine system AEC permits issued or denied during the first 13 months of the CAMA permit program. The 30 permits for development in Beaufort and Brunswick counties equaled 18.2 per cent of the total. |

Table IV-2

Major CAMA and Dredge and Fill Permits Issued or Denied
for Development in Estuarine System AECs, by County,
March 1, 1978 to March 31, 1979

| <u>County</u> | <u>Number of permits</u> |
|---------------|--------------------------|
| Beaufort | 11 |
| Bertie | 2 |
| Brunswick | 19* |
| Camden | 1 |
| Carteret | 23 |
| Chowan | 4 |
| Craven | 5 |
| Currituck | 14 |
| Dare | 14** |
| Gates | 0 |
| Hertford | 1 |
| Hyde | 6 |
| New Hanover | 21* |
| Onslow | 7* |
| Pamlico | 15 |
| Pasquotank | 5 |
| Pender | 4 |
| Perquimans | 7 |
| Tyrrell | 1 |
| Washington | 5 |
| | <u>165</u> |

*Plus one major permit for development in Ocean Hazard AECs.

**Plus two major permits for development in Ocean Hazard AECs.

Source: Office of Coastal Management

Table IV-3 shows the number of approved and denied permits for dredge and fill projects for each year from 1970 to 1979. The percentage of denials has declined dramatically since the early years of the program. Less than 4 percent of the applications were denied in 1979. The decline is due to the fact that applicants have become more familiar with, and perhaps more resigned to, the requirements necessary to obtain a permit and also because state personnel, who now meet with applicants to discuss proposed projects before they formally apply, counsel them on the standards and regulations that must be met before a permit can be issued.

All major permits issued for projects in estuarine system AECs in Beaufort and Brunswick counties from March 1, 1978, the effective date of the CAMA permit program, to November 30, 1979, were reviewed. These permits include dredge and fill projects as well as projects that fall under other CAMA regulations. Thirty-one applications for major permits were filed in Beaufort County and 30 in Brunswick County. Of the 61 applications, 60 were approved with conditions and one was denied. The one denial involved filling a private beach to cover stumps that posed a hazard to bathers and to provide an improved beach. The state objected because, among other reasons, covering the stumps would not be effective and the stumps could be removed.

Table IV-4 shows the types of activities covered by the major permits. Almost all the activities would have needed a permit under the Dredge and Fill Law even if CAMA had not been enacted. Possible exceptions are some of the bulkhead constructions and exploration of a Civil War shipwreck.

Table IV-3

Dredge and Fill Permits Issued and Denied, 1970 to 1979

| <u>Year</u> | <u>Permits Issued</u> | <u>Permits Denied</u> | <u>Percentage Denied</u> |
|-------------|---------------------------|---------------------------|------------------------------|
| 1970 | 199 | 13 | 6.5% |
| 1971 | 235 | 26 | 11.1 |
| 1972 | 230 | 44 | 19.1 |
| 1973 | 224 | 43 | 19.2 |
| 1974 | 198 | 18 | 9.1 |
| 1975 | 205 | 7 | 3.4 |
| 1976 | 223 | 21 | 9.4 |
| 1977 | 183 | 15 | 8.2 |
| 1978 | 220 | 10 | 4.5 |
| 1979 | 153 | 6 | 3.9 |

Source: Office of Coastal Management

All but three of the proposed projects required federal Section 10 permits, Section 404 permits, or both. Exploration of a Civil War shipwreck and two projects of state agencies did not require federal permits. All other projects would have been subject to regulation under federal permit programs even if CAMA had not been enacted.

Table IV-4

Kinds of Activities Covered by CAMA Major Permits Issued
in Beaufort and Brunswick Counties

| <u>Activity</u> | <u>Number of permits</u> | <u>Percentage of total</u> |
|--|--------------------------|----------------------------|
| Excavating or maintaining boat channels or boat basins | 15 | 24.6% |
| Bulkhead construction or repair | 19 | 31.1 |
| Bulkheading and filling | 10 | 16.4 |
| Bulkheading and dredging | 1 | 1.6 |
| Excavating, widening, or maintaining ditches | 3 | 4.9 |
| Filling | 4 | 6.6 |
| Laying pipeline | 2 | 3.3 |
| Marine railway construction | 2 | 3.3 |
| Preparing roadbed | 1 | 1.6 |
| Constructing settling basin | 1 | 1.6 |
| Exploring Civil War shipwreck | 1 | 1.6 |
| Constructing jetties | 1 | 1.6 |
| Other | <u>1</u> | <u>1.6</u> |
| | 61 | 100.0% |

FOOTNOTES

1. 15 N.C.A.C. 7H.0209.
2. Id. 7H.0209(e)(1).
3. Id. 7H.0209(e)(2).
4. Id. 7H.0209(e)(3).
5. Id. 7H.0209(e)(5).
6. Id. 7H.0209(e)(6).
7. Id. 7H.0209(e)(8).
8. Id. 7H.0205(b).
9. Id. 7H.0205(d).
10. Id. 7H.0205(d).
11. Id. 7H.0208(a).
12. Id. 7H.0208(b).

V. THE ISSUE OF COMPENSATION

The issue of compensation is raised by that part of Resolution 33 which requires a study of ". . .(3) funding that would be needed in order to adequately compensate landowners for their losses as a result of such regulation." Two aspects of the issue are addressed here: the procedures established by CAMA concerning compensation, and the case law concerning compensation requirements.

A. Compensation Procedures Under CAMA

CAMA contains two relevant provisions. One is a general statement in G.S. 113A-128 disclaiming any authority under CAMA for governmental actions that would constitute a taking in violation of the federal or state constitution. This provision seems to have more political than substantive content, since it only states what would be the law in any event.

The other provision, contained in G.S. 113A-123(b), establishes a procedure for expedited judicial determination of takings issues that may be raised in the future by landowners concerning actions by the Commission under CAMA. When this provision was proposed as a House Committee amendment to the coastal area management bill in 1974, it was summarized in a memorandum from committee counsel as follows:

Expedited Procedure for Raising "Takings" Questions

This amendment gives a landowner access to the courts to raise the question: was an order of the Commission so restrictive of property rights as to be the equivalent of a taking of property for public use without just compensation?

If governmental action does have this effect, it would violate constitutional just compensation requirements. The bill already expresses (in G.S. 113A-128) the intent not to authorize any actions that would amount to a "taking" of property. This amendment simply provides a machinery for implementing the original intent of the bill.

Under the amendment, "takings" questions could be raised in Superior Court within 90 days after a landowner is notified of an order of the Commission. The Court would be directed to expedite the trial of these cases. If the court finds the Commission's order to be so restrictive of property rights as to amount to an unconstitutional "taking," the Court would direct the Commission to exclude the plaintiff's land from its order. The Commission could then institute condemnation proceedings, if it wished, or could reconsider the scope or nature of its order.

The procedure proposed by this amendment is identical to one established by existing law, under the Coastal Wetlands Act (G.S. 113-230).¹

To this description it only need be added (1) that G.S. 113A-123(b) declares that this expedited procedure shall be an exclusive method for determining takings issues under CAMA, and (2) that the test of a taking under G.S. 113A-123(b) is whether the Commission's action "so restricts the use of [the landowner's] property as to deprive him of the practical use thereof, being not otherwise authorized by law." The "practical use" test stems from a dictum in an early North Carolina zoning case, Helms v. City of Charlotte, 255 N.C. 647 (1961). The phrase "being not otherwise authorized by law" in G.S. 113A-123(b) makes it "plain that the benefits of the takings procedure are not available in cases where, for any reason, a 'taking' is authorized by law-- . . . e.g., [by] the constitution, legislation, case law, etc."²

Most important, the expedited procedure for takings cases in G.S. 113A-123(b) and the general provision in G.S. 113A-128 reflect the

legislature's active concern that landowners who believe that their property has been taken or is in danger of being taken as a result of CAMA proceedings will have a full and prompt opportunity to test their claims. Indeed, the addition of the expedited procedure by way of amendment was one of three key features of a compromise that made possible the enactment of CAMA in 1974.³ This is an unusual procedure that goes further than most regulatory laws in responding to landowner concerns over potential regulatory takings. CAMA does not, however, attempt to fund the actual payment of established compensation claims; that would have to await further legislative action.

B. Case Law Concerning Compensation Requirements

The regulatory-takings question has been extensively litigated in recent years in various state courts. Among the pertinent issues prominently litigated have been flood plain zoning, down-zoning, shoreline land use regulation, and estuarine land and water use regulation. A large body of legal literature addresses the subject, and a number of theories have been advanced to explain the cases in which regulatory takings have been found or denied by the courts. No effort will be made here to summarize that large body of general case law and literature, beyond restating several basic propositions.

(1) Some state courts, including North Carolina's, will probably find in some instances that there has been a regulatory taking that must be compensated.

(2) No North Carolina decisions have yet addressed the particular takings questions that seem likely to arise under CAMA's ocean hazard and estuarine

protection AEC provisions. Definitive answers to these questions will have to await future court decisions.

(3) One useful classification of takings cases involves distinguishing (a) the decisions that lay heavy or exclusive weight upon the diminution in value of the affected property from (b) the decisions that balance the loss of value to the landowner against the public benefit from the regulation.

(4) The Helms decision, from which the CAMA "practical use" test was drawn, at first glance may seem to lay heaviest stress on diminution in value. Two recent analyses of the North Carolina decisions, however, have suggested that a balancing test is implicit in the Helms decision.⁴ This view has been summarized as follows:

Professor Glenn, in a discussion of the Helms case, rather persuasively argues that the court is not looking merely at the diminution of the value of the property, but is balancing the loss of value to the landowner against the public benefit to be secured by the regulation. What the court has in effect done, Professor Glenn argues, is to say that if the benefit secured by zoning plaintiff's property residential is small compared to the harm inflicted on plaintiff by the regulation a taking has occurred. Although there is no express language in Helms to the effect that the court is using a balancing test, the court's approach to the facts indicates that it is, and in any event, when Helms is read together with [other relevant zoning cases] cases, a strong inference can be drawn that diminution of value alone does not cause a taking and that the court is willing to look at other factors than just harm to the landowner. This suggests that in cases in which the taking issue is raised, attorneys for the regulating agency should be able to make good use of arguments concerning the public harm and costs generated by the unregulated use of the land in question and of the public benefits to be secured by the regulation.⁵

The prospects for decisions on CAMA's hazard area provisions have been specifically commented on as follows:

Land-use regulation to control flood damages in the coastal area has several aspects that set it apart from land-use regulation to protect against riverine flooding. For one thing, private ownership of the land stops at the mean high-tide line, and title to the land seaward of that line, the foreshore, remains in the state. Also, several state regulatory programs already are in existence that in one way or another can be utilized to protect against flood hazards. These are the Coastal

Area Management Act, especially the provisions authorizing the designation of areas of environmental concern, the control of dredging and filling, and the act protecting sand dunes along the Outer Banks. This is not to say that taking questions may not arise with regard to existing state programs, but rather to point out that there are comprehensive state programs aimed at preserving dunes, vegetation, and natural areas along the coast, and that these programs are strong evidence of a paramount public purpose in support of the regulations that extends beyond control of flood damage. The availability of factual data regarding actual damage caused by hurricanes and other storms over the years, and the plainly demonstrated need for control measures can also be used to buttress support for regulation. A typical regulation that has

been upheld in other states is an ordinance establishing a setback line seaward of which no buildings may be constructed. It would also seem that such devices as requiring buildings to be elevated and floodproofed would be upheld if reasonable under the circumstances.⁶

(6) As a general matter, CAMA's estuarine waters provisions seem, if anything, less vulnerable to adverse takings decisions than the hazard area provisions, because of the strong public interest in protecting the public fisheries that are so dependent on the estuarine waters.

(7) The task of predicting future decisions of the North Carolina Supreme Court on takings questions that may arise under CAMA is complicated by the provisions in G.S. 113A-123(b), described above, that direct the courts to consider whether the "practical use" of coastal land is so restricted that, if not "otherwise authorized by law," a taking has occurred. Only future court decisions can determine whether this statutory test departs from or merely incorporates by reference the line of decisions on takings issues that is evolving in other contexts.

* * * * *

In Adams v. Department of Natural Resources, the North Carolina Supreme Court was presented with the argument that CAMA authorized regulatory takings. The court rejected these claims as premature, since the plaintiffs had not been denied a development permit, a variance or an exemption.

Recent litigation in other states under statutes similar to CAMA has been summarized as follows:

Decisions outside of North Carolina show that the courts of other jurisdictions are confronting similar issues under their coastal management laws. Though it is too early to identify clear decisional directions, these decisions show the beginnings of trends on takings questions and on other issues that are likely to confront the courts in North Carolina and other coastal states.

In *Tom's River Affiliates v. Department of Environmental Protection* (1976), New Jersey's highest court . . . decided on the merits that denial of a development permit did not constitute a regulatory taking if reasonable development alternatives were available to the landowner. A similar result was reached by the Washington State Supreme Court in *Department of Ecology v. Pacesetter Construction Company*, sustaining an injunction against construction of a shoreline-front house in violation of setback and height limitations established under the Washington Shoreline Management Act. In reaching this decision, the Washington Court applied a balancing test to reject an argument that the regulations amounted to a "taking."⁷

FOOTNOTES

1. Heath, A Legislative History of the Coastal Area Management Act, 53 N.C.L. Rev. 345, 396, 138 (1975).
2. Id. at 396, no. 139.
3. Id. at 361-62, no. 54.
4. Glenn, The Coastal Area Management Act in the Courts: A Preliminary Analysis, 53 N.C.L. Rev. 303, 330 (1975). Campbell & Heath, Legal Aspects of Flood Plain Management, U.N.C. Water Resources Research Institute Report No. 137 (1979), pp. 37-38.
5. Campbell & Heath, op. cit. supra note 4, at 37-38.
6. Id. at 40.
7. Heath & Moseley, A Progress Report on the Coastal Area Management Act, 45 Popular Government 35 (Spring 1980).

VI. SUMMARY AND CONCLUSIONS

A. Summary

The purpose of this study, which was conducted in response to a resolution of the 1979 General Assembly, was to assess the impact of regulation under the Coastal Area Management Act (CAMA) and the Dredge and Fill Law on land use and land values in the coastal area; and from this assessment to determine (1) whether regulation has resulted in inequity or unfairness, and (2) the amount of money that would be required to compensate landowners for reduced land values.

The assessment of the impact of regulation on land use and values was made by (1) analyzing the laws and regulations that affect land use in the coastal area; (2) analyzing CAMA and Dredge and Fill Law regulations; (3) analyzing state regulatory actions under the CAMA permit programs for minor and major development, including dredge and fill projects, in a sample of seven beach communities and two counties; and (4) making field surveys in selected beach areas to evaluate the impact of regulations under local conditions.

Since land use in coastal areas is affected by numerous federal, state, and local laws and regulations, it was necessary to distinguish the effects due solely to CAMA and Dredge and Fill Law regulations. Even in the absence of these two laws, land use would be affected by many federal, state, and

local laws and regulations. Except for development in Ocean Hazard AECs landward of the high-tide line, almost every development project that requires a CAMA or Dredge and Fill permit also requires a permit from the Corps of Engineers under Section 404 of the Clean Water Act of 1977 or Section 10 of the Rivers and Harbors Act of 1899, and federal guidelines for these permits are potentially more restrictive than state guidelines. Similarly, in the selected beach communities local ordinances impose restrictions through minimum lot-size requirements, oceanfront and street setback requirements, sand dune regulations, building codes, and so forth. In most denials of a CAMA permit, the proposed development failed either to comply with local ordinances or to meet a combination of state and local regulations (i.e., the CAMA setback requirement and local street setback requirements).

CAMA regulations governing land development apply only to land within designated AECs, which now include only a very small portion of the land in the twenty-county coastal area--primarily a 75-foot strip along the estuarine shoreline and a strip as narrow as 60 feet along the beaches of the barrier islands. Outside the AECs, the effect of CAMA on land use is limited to the requirement imposed by the act that land-use plans must be made by local governments. However, Section 307 of the Federal Coastal Zone Management Act requires that federal grant programs, licenses, permits, and development projects be consistent with the state's management program, which includes the local land-use plans, and state policies. Thus the "consistency" provision of Section 307 gives the state some limited power to affect land use outside the AECs. So far, however, the consistency provisions have not affected federal decisions. ?

To assess the impact of regulation on land values and land use in designated AECs, regulatory decisions under the permit programs for minor and

major development and dredge and fill projects were analyzed. A sample that included seven beach communities--Kill Devil Hills, Nags Head, Wrightsville Beach, Pine Knoll Shores, Emerald Isle, Long Beach, and Holden Beach--and Beaufort and Brunswick counties--was chosen to represent different parts of the coast and different types of land, and applications for permits in these jurisdictions during the first 21 months (March 1, 1978 to November 30, 1979) of the program were reviewed and analyzed. The analysis of permits in Ocean Hazard AECs of the selected beach communities appears in Chapter III. Analysis of permits for development in estuarine shoreline and wetland AECs in the selected beach communities and in Beaufort and Brunswick counties is found in Chapter IV.

Ocean Hazard AECs. The basis for regulation in Ocean Hazard AECs are the natural hazards due to beach erosion (which is a manifestation of a natural process of island migration caused by a gradual rise in the sea level) and storms and hurricanes. CAMA regulations for development in Ocean Hazard AECs fall generally into four categories: (1) regulations to control shoreline, beach, and dune erosion; (2) regulations to ensure construction standards adequate to protect life and property from ocean and weather hazards; (3) a regulation that requires buildings to be set back from the ocean a prescribed minimum distance, the distance being determined by the average annual rate of erosion in feet times the factor 30 (which was chosen apparently to represent either the physical life of a building or the maximum life of a mortgage); and (4) regulations governing construction of public facilities that may have adverse effects on the coastal environment.

The only regulation that is likely to have a significant impact on development in Ocean Hazard AECs is the one that requires buildings to be constructed behind the setback line. In some areas oceanfront lots are

too narrow to permit construction of a building that complies with the CAMA oceanfront setback requirement and local ordinances that require buildings to be placed a minimum distance from the street. The CAMA setback line varies from a minimum of 60 feet, as measured from the first line of vegetation, to 140 feet in areas with high rates of erosion.

There were 191 applications for CAMA minor development permits in the Ocean Hazard AECs of the selected beach communities during the first 1 3/4 years of the permit program. Of this total, 173 (90.6 per cent) were approved, nine (4.7 per cent) were approved with one or more conditions (conditions that merely restated regulations were not considered as true conditions), and nine (4.7 per cent) were denied. Permits were denied in only four of the beach communities. There were no denials in Nags Head, Pine Knoll Shores, or Wrightsville Beach. Only two denials prevented an applicant from building on his land (see Holden Beach Denial #1 and Kill Devil Hills Denial #1 in Chapter III). Both of these cases involved eroded lots that were very vulnerable to ocean and weather hazards. In both cases a residence that previously existed on the property had been moved to avoid damage or destruction, and in both cases the area has had a history of chronic erosion. Five of the denials did not prohibit construction of a residence of a size and configuration that would meet the CAMA and local setback requirements; two others involved emergency bulldozing of sand and construction of a bulkhead. Thus, in only two out of 191 minor permit cases in the Ocean Hazard AECs of the selected beach communities did CAMA regulations clearly act to prohibit development, and in one of these cases (and possibly in both) the proposed development would not have been allowed under local ordinances. Only three

applications for major development permits were filed in the selected beach communities, and all were approved with conditions.

While the analysis of permit decisions suggests that CAMA regulations have so far not had a major impact on beach development, in fact the CAMA setback regulation in combination with local street setback requirements does prohibit development of numerous oceanfront lots. Most of the denied permits for development of oceanfront lots have been denied because of the CAMA setback requirement, and future applications for development of many other such oceanfront lots could be denied on this basis. The potential impact of the requirement varies considerably along the coast. At Pine Knoll Shores erosion is moderate, and the local setback line is further inland than the CAMA setback line. At Holden Beach neither the CAMA or local street setback requirements will have a major effect because on most sections of the beach residences can be built on the two rows of lots between the beach and the road. At Long Beach, on the other hand, there is only one row of lots between the beach and the road, and the CAMA setback requirement proscribes development of about 79 lots.

About 500 lots have been tentatively identified--through aerial, map, and field surveys--as too narrow to permit construction of a building at least 20 feet deep that would be consistent with both CAMA and local setback requirements. Some 200, or 39 per cent, of these lots are on a single stretch of the beach in Kill Devil Hills and Kitty Hawk where, because of chronic erosion, the lots have become very narrow. About 175, or 36 per cent, of the lots are in three other problem areas--West Onslow Beach, Long Beach, and the inlet area at the eastern end of Ocean Isle. Most of the other lots are in

special problem areas like the site of the Holiday Inn at Wrightsville Beach; like Yaupon Beach, where erosion has destroyed several rows of oceanfront lots; and like the eastern end of Holden Beach near Lockwood Folly Inlet, where many platted lots are now under water.

The fact that these lots are undevelopable under CAMA regulations does not necessarily mean that it was CAMA regulations that prevented development or reduced land values. In many cases the lots have been eroded, and market values reflect the hazards of building on them. In other cases, however, the lots would have a substantial market value except for the CAMA setback requirement, and some people would undoubtedly be willing to accept the risks of building on them. This is best illustrated by the situation at Long Beach, where relatively narrow oceanfront lots are bounded by a street. Erosion is moderate at most places on the beach (less than two feet per year), but the CAMA setback line is the minimum prescribed in the regulations, that is, 60 feet. The 79 lots identified as undevelopable are not in one area but rather are interspersed among developed lots. Although development of these lots is not without risks (there has been serious erosion at some points along the beach and there is a substantial danger from major storms), many of the lots would probably be developed eventually and have substantial market value--perhaps \$30,000 to \$40,000 at current prices--except for the CAMA setback requirement. Furthermore, some of the lots might be developable under CAMA regulations if the setback requirement were relaxed slightly.

Thus, while uniform application of the setback requirement may be necessary and appropriate for the areas of the coast that have serious erosion problems, and this appears to be the case for many of the lots identified as undevelopable, in certain instances other options might be considered.

Small

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variances might be granted on the basis of particular circumstances; laws or regulations might require full disclosure of risks to builders and prospective purchasers; or owners might be required to move buildings if they should ever encroach on the beach as a result of erosion (this is not to say that these options necessarily are all available today under CAMA).

Of the seven selected beach communities, only two have been significantly affected by CAMA regulations--Long Beach, because of the potential impact of the CAMA setback requirement, and Kill Devil Hills, where about 28 of the approximately 78 undeveloped lots are undevelopable because of the CAMA setback requirement (whether the latter lots would be developed is questionable because of the hazards due to erosion and the necessity to comply with local ordinances). Wrightsville Beach has chronic erosion problems, but, except for the development near the Holiday Inn, these problems have been controlled by a series of beach-restoration projects (including a \$2.5 million project now under way), and CAMA regulations have not significantly affected development. CAMA regulations have not had a significant impact so far at Nags Head, Pine Knoll Shores, Emerald Isle, or Holden Beach.

Estuarine System AECs. Applications for CAMA permits for minor and major development and dredge and fill permits in the Estuarine Shoreline and Wetlands AECs in the seven selected beach communities and in Beaufort and Brunswick counties were analyzed. Of the 248 minor permit applications filed, 236 (94.5 per cent) were approved, 11 (4.2 per cent) were approved with conditions (not including conditions that amounted to restatements of regulations), and one (0.4 per cent) was denied. The denial involved a minor permit for a residence on the estuarine shoreline at Wrightsville Beach that

was too large to comply with local zoning ordinances and the CAMA regulation requiring that no more than 30 per cent of a lot be covered with impermeable surfaces; the applicant later built a still quite large residence on the lot. The conditions attached to permits did not substantially restrict development of land. For the entire coastal area, out of a total of 980, only seven applications for minor permits for development in the estuarine shoreline and wetlands AECs were denied during the first two years of the permit program.

Of the 61 applications for permits for major development in estuarine shoreline and wetland AECs in Beaufort and Brunswick counties during the first 1 3/4 years of the CAMA permit program, only one was denied; that denial involved a project to cover a private beach with sand to cover stumps that posed a hazard to bathers. It did not prevent use of the beach, because the stumps could have been removed. All proposed development projects on privately owned land also required either Section 404 or Section 10 permits from the Corps of Engineers. The percentage of denied applications for Dredge and Fill permits has declined sharply since the program began in 1970. In 1979, six out of 153 applications, or 3.9 per cent, were denied. All dredge and fill projects require federal permits as well as state permits, and it is therefore doubtful that the denied state permits restricted land use.

B. Conclusion

1. The impact of regulation on land use and land values. The analysis of permit decisions in the areas selected for study suggests that regulations under CAMA and the Dredge and Fill Law have not so far had a major impact on

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development in the coastal area. Of the few denials, only two prevented applicants from developing their land, and in at least one of these cases the proposed project did not comply with local ordinances. For the entire coastal area, relatively few applications have been denied; and in the case of projects in the Estuarine Shoreline and Wetland AECs, almost all the projects would have required federal permits that are issued under guidelines at least as restrictive as state guidelines.

However, the CAMA oceanfront setback requirement, in combination with local setback requirements, potentially restricts development of a considerable number of oceanfront lots. Since many of these lots are narrow, severely eroded, or in very vulnerable areas, the restrictive effect of the setback requirement may be entirely consistent with the goals of CAMA and may serve to protect unwary people from property losses. The situation at Long Beach, on the other hand, illustrates some of the more complicated issues involved in the uniform application of a setback regulation.

2. Inequities or Unfairness Resulting from Regulation. The findings of this study suggest that in general there has been no widespread inequity or unfairness resulting from CAMA and Dredge and Fill Law regulation because regulation has not in general restricted owners from developing land.

The question of inequity in regard to some of the oceanfront lots restricted by the CAMA setback requirement, however, is difficult. For lots that have been severely eroded or are highly vulnerable to natural hazards, wise policy may require that landowners and those who might purchase the property later be prevented from taking risks that they may not fully recognize or appreciate. Furthermore, it may be in the public interest to

And public use of beach
prevent building of structures that will soon be in the surf and encroaching on public property as a result of erosion (like, for example, the Holiday Inn and nearby residences at Wrightsville Beach). No question of equity is raised by these cases.

On the other hand, a regulation that may be appropriate for some areas or lots may not be appropriate for all areas or all lots. The situation at Long Beach, for example, poses serious questions about the setback requirement in terms of equity among neighboring landowners. A difference of a few feet in the setback might, in some of the cases, determine whether a lot could be developed and therefore would significantly affect its market value.

3. The Question of Compensation. One purpose of this study was to estimate the amount of money that would be required to compensate landowners for the effects of regulations on land values. The findings of this study suggest that CAMA and Dredge and Fill Law regulations have not in general significantly affected the value of land because they have not significantly restricted the use of land. While regulations may impose restrictions on the way land is developed, except where development is restricted by the ocean setback requirement, few instances have been identified in which regulations prevented owners from developing or using property. Even the denial of permit applications has not proscribed development in all cases, and usually development would be subject to similar regulations under federal laws or local ordinances.

However, the combination of the CAMA setback requirement and local setback ordinances has a potentially significant effect on the value of some oceanfront lots. Aside from fundamental questions about the appropriateness



of compensation in these cases, it is not possible to estimate the amount by which property values have been reduced solely by the CAMA setback requirement. Many of the lots in question are too small or too vulnerable for development, and this undoubtedly is reflected in their market values. For example, one lot for which a permit was denied was classified for tax purposes as an underwater lot and assessed for \$100. On the other hand, some lots identified as undevelopable at Long Beach might have a market value of perhaps \$30,000 to \$40,000 except for the CAMA setback requirement. The market value of the affected lots may not fall substantially because owners and buyers may speculate that the setback requirement may be changed or that variances will be granted. Finally, it is difficult to determine whether development of all the lots in questions could comply with local ordinances; if some of these lots could not be developed even in the absence of the CAMA setback requirement, none of the reductions in property value could be attributed to CAMA regulations.

Because conditions vary so much from one beach community to another and even from one lot to another, the amount of money, if any, that would be appropriate to compensate landowners for the effects of regulations would have to be determined on a case-by-case basis through the courts. The act provides for an accelerated court process to hear claims of landowners for compensation, and this judicial procedure provides an obvious method to determine whether compensation is warranted and the amount of money that would be appropriate.

