



Association of State Flood Plain Managers

Introduction

If flood damages in the nation are to be reduced, state and local floodplain management programs must be strengthened. Stronger state programs require stronger state legislation. The following excerpt from "Strengthening State Floodplain Management"* illustrates the problem and need:

"Floodplain management is a national concern. States can continue to play pivotal roles in cooperative efforts to reduce taxpayer costs for flood losses in coastal and riverine areas. This is an appropriate exercise of the police powers reserved to the states by the U.S. constitution.

During the past decade, many states have established standards for floodplain regulations; carried out mapping programs; coordinated federal, state and local programs; provided technical assistance to localities and landowners; carried out training and education efforts; and promoted other flood loss reduction activities. The strongest local floodplain management efforts are, with few exceptions, in states with active programs.

Despite some stronger state programs, development pressures, conflicting intergovernmental policies and inadequate management have allowed and even encouraged continuing development in some flood-prone areas. Unless active measures are taken to guide future development, annual flood losses are projected to increase to between \$4-5 billion dollars per year by the turn of the century, despite increased use of flood control works. Much of this amount will be paid by taxpayers through subsidized flood insurance, disaster relief, low-cost rehabilitation loans and grants and flood control works. In the past, this financial burden was borne almost entirely by the Federal Government; but evolving cost-sharing policies will require each state to bear an increasing share--as much as hundreds of millions of dollars in a major disaster. It, therefore, behooves state legislatures to enact sound floodplain management programs to prevent this drain on state and local treasuries."

The Association of State Floodplain Managers, under contract with the Federal Emergency Management Agency (FEMA), has developed model legislation to strengthen state programs. Any state wishing to strengthen its floodplain management program can review any of the model legislation options herein and select the approach which best benefits it's specific needs.

*Produced by the Association of State Floodplain Managers for the Water Resources Council, Published by the Natural Hazards and Research and Applications Information Center, University of Colorado, 1982.

The Association of State Floodplain managers is pleased to have worked with FEMA in the development of this model legislation. We appreciate the assistance of the many FEMA staff and particularly acknowledge the assistance of Jane Bullock, Mike Robinson, John Seyffert, Joe Sredl and Melinda Hulsey. We thank Dr. Jon Kusler, who served as a consultant to the organization. Larry A. Larson, Wisconsin Department of Natural Resources was the principal author, particularly of the basic legislation. Patricia A. Bloomgren, Minnesota Department of Natural Resources, was the principal author of "Innovative Techniques." Stan Humphries, Massachusetts Division of Water Resources, provided the language for coastal considerations. Dorothy Lagerroos served as a consultant to the Association. Special appreciation is extended to the floodplain management staffs of the Wisconsin and Minnesota Department's of Natural Resources. The report was reviewed by the Association's Regional Representatives and Committee Chairs, including:

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MODEL FLOODPLAIN STATUTES

Background

The Model Floodplain Statutes developed herein build off of the model statutes in Volumes 1 and 2 of, "Regulation of Flood Hazard Areas," prepared by the Water Resources Council, 1969 and 1971, respectively. These model statutes have been developed with a "forward look" to address problems and opportunities beyond basic regulation. As we enter the last decades of the 20th Century there are some overriding considerations that will dictate the course of floodplain management to come. These will include:

1. The economic situation which dictates that state and local governments must assume their rightful role in floodplain management throughout the nation.
2. Increasing urbanization which creates flooding, flood damages and tax burdens for flood insurance payments and flood disaster relief in areas where no flooding previously occurred. This "urbanization" impact must be addressed comprehensively to avoid an ever increasing burden on the tax payers of this nation for flood disaster preparedness, rescue and relief, flood disaster payments, cleanup costs, and costs to rebuild streets, sewers and water lines.
3. A realization by Congress that the Flood Insurance Fund is second only in size to the Social Security Fund as a potential debt to the taxpayers. It is currently hovering around the \$100 Billion mark and will continue to increase. It is particularly vulnerable in coastal urban areas. For example, about 1/3 of the flood insurance policies exist in the State of Florida. A major disaster could do more to change the dictates and nature of the Floodplain Management Program than any gradually involved federal, state or local policy.

The Statutes from Volume 1 and 2 of, "Regulation of Flood Hazard Areas," have been redrafted after a comprehensive examination of new Statutes by Pat Bloomgren (Minn.) in the report "Strengthening State Floodplain Management" prepared by the Association of State Floodplain Managers for The Water Resources Council (1981). This redrafting reflects new approaches based upon what has and what has not been working and will be included herein. The basic statutes are written to regulate the floodplains within any given state. The attached appendices will address innovative and incentive programs to reduce flood damages that have been utilized in various states. A copy of those innovative state statutes are then included in the appendices for use as a model by any state.

A critical element of any state statute is to determine who will actually regulate and have the prime responsibility for issuing permits and making decisions in the floodplains of a given state. There are two basic options: (1) a state agency may actually regulate through permits, or (2) the state will authorize and require local communities to administer regulations in flood hazard areas. Model statutes have been developed for the following scenarios:

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Explanation

Each of the above programs has been used successfully in some state. Other states, when developing legislation can review this list and select those types of programs which best fit their particular problem or opportunity.

Coastal Regulation - Throughout these model statutes, regulations relating to coastal areas have been added inside brackets []. Non-coastal regulations can omit those provisions. For states needing coastal regulations the basic statute is used, but is expanded by adding the coastal requirements inside the brackets.

All of the model statutes will be provided with commentary indicating options, problems or special concerns to be watched for by state legislatures when adopting statutes. The commentary will also indicate why a particular section of a statute is important and what the purpose of that section of the statute is.

These model statutes are quite specific in detail. Some states may find it advantageous to remove some of the specificity from the statutes and place it in Administrative rules. This would make for a more streamlined and less technical statute.

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Purpose and Findings

A. The legislature of the state of _____ finds that recurring floods threaten life, health and damage property and that the public interest requires the floodplain be managed and regulated in order to minimize hazards to life, health and property.

It is the policy of this state to reduce flood damages and the number of people and structures at risk in flood hazard areas through floodplain management, stressing nonstructural measures such as floodplain zoning, floodproofing, flood warning and acquisition/relocation.

[...recognizes that recurring coastal floods are aggravated by wind which impacts metastable landforms, often in an unpredictable manner. Variable wave and current processes during changing tide levels offer the greatest threat to life, health and property.]

B. The purpose of this Statute is :

- To protect human life, health and property;
- To preserve floodplains [and coastal high hazard areas] for the purpose of carrying and storing flood waters;
- To reduce the public cost of providing emergency services, flood control structures and rebuilding public works damage by floods;
- To protect the tax base and jobs;
- To reduce the threat of increased damages to existing uses;
- To provide for the orderly development and wise use of floodplains [and coastal high hazard areas];
- To minimize business interruptions;
- To discourage victimization of unwary land and home buyers;
- To preserve the natural functions and resources of the floodplains [and coastal high hazard areas].
- [to preserve the volume (height and width) and form of dunes, barrier beaches and other natural protective barriers].
- [to prevent increased flooding and erosion caused by improper development, including construction of seawalls, bulkheads, groins, jetties, filling, grading or mineral extraction.]

Definitions

ncy" or "Department" means (the Natural Resources Agency of the State).

ndment" means any change to the official floodway lines, water surface files, floodplain zoning maps or text of the floodplain zoning nance.

["Barrier beach" means a narrow low-lying strip of land generally consisting of beaches and dunes extending roughly parallel to the trend of the coast and separated from the mainland by a narrow body of fresh, brackish or saline water or a marsh system.]

["Coastal high hazard area" (e.g. V-zone) is a coastal area of special flood hazard that is inundated by the tidal regulatory flood (100 yr) that has additional hazard due to velocity caused by wave action.]

"Development" means any man-made change to improved or unimproved real estate, including but not limited to the construction of buildings, structures or accessory structures, or the construction of additions or substantial improvements to buildings, structures or accessory structures; the placement of mobile homes; mining, dredging, filling, grading, paving, excavation or drilling operations; and the deposition or extraction of materials.

["Dune" means any natural hill, mound or ridge of unconsolidated sediment landward of a beach deposited by wind action or storm overwash; also sediment deposited by artificial means and serving the purpose of storm damage prevention or flood control.]

"Equal degree of hydraulic encroachment" means taking into account the effect of any encroachment into the floodway. It is computed by assuming an equal degree of hydraulic encroachment on the opposite side of a river or stream for a significant hydraulic reach, in order to compute the effect of the encroachment upon hydraulic conveyance. This computation assures that property owners up, down or across the river or stream will have the same rights of hydraulic encroachment. (Also see: Hydraulic reach and floodway lines.)

"Equal degree of hydrologic encroachment" means taking into account the effect of any development on the storage capacity of a floodplain area, particularly upstream from urban areas. It is analyzed assuming an equal loss of flood storage for all property owners and subdivided lots in the storage area of a floodplain on both sides of a river or stream for the involved storage area.

"Erosion" - The wearing away of land by the action of natural forces; [on a beach or dune, the carrying away of sediment by wave action, tidal currents, littoral currents or by deflation.]

"Flood" means a general or temporary condition of partial or complete inundation of normally dry land areas caused by the overflow or rise of river, ocean, streams or lakes, or the unusual and rapid accumulation or runoff of surface waters from any source.

"Flood fringe" is that portion of the floodplain outside of the floodway [and/or coastal high hazard zone], which is covered by floodwaters during the regulatory flood.

"Floodplain" is the land which has been or may be covered by flood waters, and is surrounded by flood water and inaccessible, during the occurrence of regulatory flood. The riverine floodplain includes the floodway and flood fringe.

"Floodplain management" - The analysis and integration of the entire range of measures that can be used to prevent, reduce or mitigate flood damage at a given location, and that can protect and preserve the natural, environmental, historical, and cultural values of the floodplain.

"Flood profile" is a graph or a longitudinal profile line showing the relationship of the water surface elevation of a flood event to locations and surface elevations along a stream or river.

"Floodproofing" means the modifications of structures, their sites and building contents and water and sanitary facilities to keep water out or reduce the effects of water entry.

"Flood Protection Elevation" means an elevation which shall correspond to the elevation of the 1% chance flood (100 yr), plus any increased flood elevation due to floodway encroachment, plus _____ feet of freeboard.

"Floodway" is the channel of the river or stream and those portions of the floodplain adjoining the channel required to discharge and store the floodwater or flood flows associated with the regulatory flood.

"Freeboard" - Represents a factor of safety usually expressed in terms of a certain amount of feet above a calculated flood level. Freeboard compensates for the many unknown factors that contribute to flood heights greater than the height calculated. These unknown factors include, but not limited to, ice jams, debris accumulation, wave action, reduction of bridge openings and floodways, the effects of urbanization on the hydrology of the watershed, loss of flood storage areas due to development and the sedimentation of a river or stream bed.

"Freeboard" - The additional height of a shore protection structure above the design high water level to prevent overflow. Also, at a given time, the horizontal distance between water level and the top of the structure.]

"Groin" is a structure built (usually perpendicular to the shoreline) to prevent littoral drift or retard erosion of the shore.]

"Jetty" in open sea coasts is a structure extending into a body of water, designed to prevent shoaling of a channel by littoral materials, and to direct and confine the stream or tidal flow. Jetties are built at the mouth of a river or tidal inlet to help deepen and stabilize the channel.]

"Littoral drift" means the sedimentary material moved along beaches under the influence of waves and currents.]

NOTE: The terms hydraulic and hydrologic can simply be defined as follows:

"Hydraulic" means the movement of water through a channel and its adjacent floodplain, and "hydrologic" means the storage of water within the floodplain based on volume. When hydraulic encroachment is involved, water tends to back up causing higher flood levels upstream and when hydrologic encroachment occurs, the storage capacity is reduced causing water to move more quickly through the watershed causing higher flood elevations downstream.

NOTE: A state should select freeboard which is adequate to protect against the problems it experiences, e.g. ice jams, etc. Many states use one or two feet.

["Littoral transport" is the movement of littoral drift along beaches by waves or currents, including movement parallel (longshore transport) and perpendicular (on-offshore transport) to the shore.]

"Local Government" - In the context of this Statute means any county, city or village (or other political subdivision having adequate planning and zoning authority to regulate land use).

["Metastable" means a relatively unstable, transient, but significant state or condition of a physical system such as unconsolidated sediment. Metastable landforms include beaches, dunes and barrier beaches in the coastal zone.]

"Mitigation" means any action that is taken which will reduce the impact, damage or cost of the next flood which occurs.

"Person" means any individual, group of individuals, corporation, partnership, association, political subdivision, public or private agency in the state.

"Regulatory Flood" (or regional or base flood) - Is a flood determined to be representative of large floods known to have generally occurred in (State) which may be expected to occur on a particular stream because of like physical characteristics. The regulatory flood is based upon a statistical analysis of stream flow records available for the watershed or an analysis of rainfall and runoff characteristics in the watershed. In inland areas the flood frequency of the regulatory flood is once in every one hundred years; this means that in any given year there is a 1% chance that a regulatory flood may occur or be exceeded.

"Shore protection structures" include the following:

"Seawall" - A structure separating land and water areas (usually parallel to the shoreline) designed to prevent erosion and other damage due to wave action.

"Bulkhead" - A structure or partition to retain or prevent sliding of the land. A secondary purpose is to protect the upland against damage from wave action.]

["Unconsolidated" means those sediments which remain loosely aggregated and have not been cemented or compressed into solid rock; includes sand, gravel, cobbles or shingles.]

"Unnecessary Hardship" means a unique and extreme inability to conform to the provisions of this ordinance due to special conditions affecting a particular property which were not self-created and are not solely related to economic gain or loss. Unnecessary hardship is present only where, in the absence of a variance, no feasible use can be made of the property.

Caution: Only those local units of government that have adequate staff and resources should be included. For these reasons, it is recommended that townships usually not be included.

NOTE: During a typical 30-year mortgage period, the regulatory flood has a 26% chance of occurring or being exceeded. By comparison, that same structure has only a 17% chance of being damaged by fire.

ance" means an authorization granted by the board of appeals to construct, alter or use a structure in a manner which is inconsistent with dimensional standards contained in a local ordinance.

NOTE: A variance may not be used to permit a use of property otherwise prohibited by an ordinance. Unnecessary hardship must be demonstrated by the applicant/property owner before a variance can be granted.

Duties and Powers

The (natural resources agency of the State of _____) shall have the authority and it shall be its duty to:

- A. Coordinate floodplain management activities of local, state and federal agencies.
- B. Be the lead state agency to receive federal funds for accomplishing floodplain management activities.
- C. Distribute information and conduct educational activities that will aid the public and other units of government to comply with the requirements of this act; provide technical assistance for better understanding of flood processes and for management of uses in the floodplain to accomplish the purposes of this act.
- D. Regulate all floodplains, whether mapped or unmapped.
- E. Administer the floodplain regulation program including, but not limited to:
 1. Establish technical standards for the delineation and mapping of floodplains, floodways [and coastal high hazard areas] taking into account existing and anticipated development.
 2. Conduct and/or coordinate engineering studies to determine the vertical and horizontal limits of floodplains, floodways [and coastal high hazard areas].
 3. Issue and deny permits, and establish standards to evaluate permits.
 4. Require the submittal of information the agency deems necessary for complete permit applications from applicants, persons and other state agencies.
- F. To serve as the repository for all flood data within this state.

Caution - A state may want to only regulate mapped floodplains.

G. To inspect and investigate all conditions relating to the obstruction or development of floodplains, the agency or its duly appointed representative shall have the right to enter at all reasonable times in or upon any private or public land for the purposes of inspection and investigation.

H. Collect reasonable fees from applicants for the cost of administering the program.

I. Assist local governments and other state agencies to develop comprehensive floodplain management programs.

J. Develop programs that address nonconforming uses and structures within the state's floodplains which will result in the gradual phase out of those nonconforming uses and the gradual conversion of nonconforming structures to floodproofed or flood protected structures through a program of relocation and/or floodproofing.

K. Mark the floodplains of the state to show elevations reached by historic flood(s) so that property owners may be aware of the potential for flooding on any given property.

L. Develop programs/procedures to acquire structures in flood prone areas that will result in an ultimate reduction in cost to the taxpayers and to preserve or restore the natural values of floodplain resources.

M. Develop data and promulgate minimum regulations that will account for the effects of urbanization that lead to increased runoff, increased flood elevations (and increased coastal erosion) which threaten existing and future development.

N. Work in cooperation with federal, state or local agencies in the development of flood warning systems, evacuation plans, and flood emergency preparedness plans for the purpose of reducing damages and the threat to life and property.

O. Promulgate rules and regulations to implement this statute.

P. Enforce the provisions of this act including the rules and regulations duly promulgated.

NOTE: Rules should establish that the cost of surveys and engineering analyses to determine flood elevations and impacts of proposed development shall be borne by the developer.

Example - A state may wish to add floodproofing standards in statewide building codes or require that all subdivision plats display flood elevations, floodway lines (coastal high hazard boundaries) and require that subdivisions in urban areas have detention basins to prevent runoff from being "increased" above pre-development conditions during a flood. Further, this could include planning and implementation of flood hazard mitigation programs.

NOTE: States considering the adoption of acquisition programs should review the existing acquisition programs in place in other states - see the section of these model statutes entitled "Innovative and/or incentive programs to reduce flood damages."

NOTE: This general subject is commonly referred to as "stormwater management" and is becoming increasingly popular for use by local or regional governments in rapidly urbanizing areas to prevent increased flood damages.

Q. Accomplish all other activities that are necessary and lawful in order to meet the purposes of this act.

Regulation of the Floodplain

A. No person shall undertake any regulated development noted herein on the floodplain, or in an area where the development will have an impact upon flood elevations and velocities in the floodplain, without a permit from the (agency). Regulated development includes both public and private works, subdivisions and alterations to nonconforming uses and structures. Also, any new use or change in use of any structure, land or water which is extended, converted or structurally altered and any development as defined in this statute shall not commence without full compliance with the terms of this statute and other applicable regulations. The (agency) may issue a permit only if it finds that the regulated development will not obstruct floodflows and result in any increase in the flood elevation (or modify littoral transport or result in any increase in coastal erosion) and will not significantly effect the storage or flood control value of the floodplains and shall not cause an adverse increase in flood velocities. Such development shall not cause an impact upon upstream, downstream or abutting property owners and shall not pose a hazard to human life, health or property in the event of a flood.

Any structure which is designed for human habitation, associated with high flood damage potential or not associated with open space use or injurious to human, plant, animal or aquatic life is prohibited (in coastal high hazard areas and) in floodways.

[Development in coastal dunes and on barrier beaches will be regulated to protect to the standing wave height plus calculated wave heights and will protect the structures through appropriate setbacks and elevation.]

Any development is prohibited in the floodway (and coastal high hazard zone) which, acting alone or in combination with existing or future similar activities will cause any increase in the regulatory flood elevation (or increase in coastal erosion) or will affect existing drainage courses or facilities (and littoral transport patterns).

Calculations for analyzing increases in flood heights due to obstructions or loss of storage [or erosion due to shoreline protection structures of coastal high hazard areas] will take into account equal degree of encroachment within a hydraulic or hydrologic reach of the river or stream [and within an appropriate longitudinal reach of a coastal high hazard area].

An increase up to 1.0 foot may be permitted, but only if amendments are made to floodplain maps and ordinances and approved by the (agency), and appropriate written legal arrangements are made with all affected property owners for any increased flood elevations, [coastal erosion, and adverse littoral transport patterns] on those properties.

Permits shall be granted only if they do not cause a threat to life, health or property, are in the public interest and result in properly floodproofed development. Where floodproofing measures are required, they shall be designed to withstand the flood pressures, depths, velocities, uplift and impact forces, and other factors associated with the regional flood, to assure protection to the flood protection elevation. In addition, all flood proofing measures shall provide anchorage of structures to foundations to resist flotation and lateral movement, and shall insure that the structural walls and floors are watertight (i.e., completely dry without human intervention during flooding) to the flood protection elevation.

Structures in floodplain [and coastal hazard areas] shall be protected to the regulatory flood elevation with an additional freeboard to the flood protection elevation as defined herein.

B. Variances

Any deviation from the standards of this regulation for which a permit has been denied, may be allowed only upon written request for a variance submitted to the agency, after a public hearing and the issuance of a variance by the Agency, which may authorize in specific cases such variance from the terms of these regulations as will not be contrary to the public interest where, owing to special conditions affecting a particular property, a literal enforcement of the provisions of this ordinance would result in unnecessary hardship. A variance:

1. Shall be consistent with the spirit and purpose of these regulations.

NOTE: See definitions of "Equal degree of hydraulic encroachment" and "Equal degree of hydrologic encroachment."

NOTE: These written legal arrangements may take various forms (e.g. flooding easement, purchase of development rights, etc.) depending upon the state's enabling statutes. It may be necessary to require that such arrangements are recorded on the deed of certain properties.

2. Shall not permit a lower degree of flood protection than the flood protection elevation.
3. Shall not be granted because of conditions that are common to a group of adjacent lots or premises.
4. Shall not be granted unless it is shown that the variance will not be contrary to the public interest and will not be damaging to the rights of other persons or property values in the area.
5. Shall not be granted for actions which require an amendment to the floodplain map(s).
6. Shall not have the effect of granting or increasing a use of property which is prohibited in a particular zoning district.
7. Shall not be granted solely on the basis of economic gain or loss.
8. Shall not be granted for a self-created hardship.

When a variance is granted the applicant shall be notified in writing, by the agency, that increased flood insurance premiums may result. A copy of this notification shall be maintained with the variance appeal record.

C. Appeals and Boundary Disputes

An applicant, the local unit of government or aggrieved property owner(s) may appeal a decision by the agency under this statute. Judicial review of the decision may be sought in accordance with the terms of the (State) Administrative procedures Act. Notwithstanding the provisions of said Act, petitions for judicial review may be filed in the appropriate Court within 30 days after notification of the decision by the agency.

NOTE: In order for any variance to be granted, the agency must determine if unnecessary hardship has been demonstrated sufficiently to warrant a permit to be issued which is inconsistent with the dimensional standards contained within the regulations. For example, where a lot is too small to place adequate fill around the structure without crossing the property line.

The following procedures shall be used by the (agency) in hearing disputes concerning the district boundaries shown on the official floodplain zoning map:

1. Where a floodplain district boundary is established, the regional flood elevations or profiles for the point in question shall be the governing factor in locating the district boundary. If no regional flood elevations or profiles are available, other available evidence may be examined.
2. In all cases, the person contesting the location of the district boundary shall be given a reasonable opportunity to present arguments and technical evidence to the (agency). Where it is determined that the district boundary is incorrectly mapped, the agency shall amend the map.

V. Enforcement Sanctions

- A. Violation of this act or the terms of any permit issued hereunder is hereby declared to be a public nuisance and may be abated or enjoined by (varies by state) court at the petition of any person or state agency.
- B. The court may authorize the agency to remove a violation at the expense of the owner or to require the owner to directly remove or modify the structure or development to comply with the regulations herein.
- C. Violations of this act or the terms of any permit issued under this act is also punishable by (fine/forfeiture) of not less than _____ nor more than _____ or by a sentence of not less than 10 days to no more than 1 year in jail. Each day of the violation is a separate offense.
- D. Citations. The violations herein may be abated or enjoined through the citation procedure authorized in the state statutes.

VI. Saving Clause

If any part of this act is found to be unconstitutional....etc.

NOTE: The classifications of a violation as civil/criminal, misdemeanor/felony, etc., should be carefully determined in each state to result in the best institutional enforcement strategy.

NOTE: In any state this may or may not be necessary depending upon other statutory provisions.

Scenario 2: STATE REGULATION, OPTIONAL LOCAL GOVERNMENT TAKEOVER

In this model statute, all of scenario 1 above (state regulation) is required, with the following provisions added or amended to allow for the optional takeover of regulations by a local government on the floodplains within their jurisdiction.

In this scenario, it will be necessary to add this section to the duties and powers above Scenario 1, (Section III):

R: Technical Assistance

The (agency) shall provide technical assistance to all local units of government through engineering assistance, model ordinances, data collection, evaluation of permits, training, monitoring of local administration and enforcement and other activities relating to the purposes of this act.

Delegation to Local Units of Government

A. Delegation Procedure

A "Local government" may submit local floodplain ordinances and adequate maps showing the appropriate floodplain limits to the (agency) of the state of () for approval. The agency shall approve the ordinance if it determines that the locality has the resources, expertise and capabilities to administer such a program and has indicated the intention to administer in accordance with the provisions of this Chapter and the general guidelines contained in rules adopted by the Department pertaining to floodplain regulations. If approved, the agency shall delegate to the appropriate local government administration and enforcement of the floodplain regulations and the authority to collect reasonable fees from applicants. The local government will then regulate all activities noted in this act in the floodway, floodplain (and coastal high hazard areas). State floodplain permits shall not be required for development which is locally permitted and conforms to the requirements of the locally approved floodplain ordinance. Enforcement actions can be taken by either the state or local government.

B. Variances

Any deviation from the standards of the floodplain zoning ordinance, for which a permit has been denied by the zoning administrator, may be allowed only upon; written request for a

NOTE: This scenario assumes local units of government already have, or will adopt, as part of this floodplain ordinance, the appropriate administrative framework (zoning committees, Board of Appeals, etc.) to administer zoning ordinances.

variance submitted to the zoning administrator, public hearing, and issuance of a variance by the board of appeals. The board may authorize in specific cases such variance from the terms of the ordinance as will not be contrary to the public interest where, owing to special conditions affecting a particular property, floodplain zoning ordinance, a literal enforcement of the provisions of the ordinance would result in unnecessary hardship. A variance:

1. Shall be consistent with the spirit and purpose of the floodplain zoning ordinance.
2. Shall not permit a lower degree of flood protection than the flood protection elevation.
3. Shall not be granted for a use that is common to a group of adjacent lots or premises.
4. Shall not be granted unless it is shown that the variance will not be contrary to the public interest or damaging to the rights of other persons or property values in the area.
5. Shall not be granted for actions which require an amendment to the floodplain zoning district or map.
6. Shall not have the effect of granting or increasing a use of property which is prohibited in a particular zoning district.
7. Shall not be granted solely on the basis of economic gain or loss.
8. Shall not be granted for a self-created hardship.

C. Appeals and Boundary Disputes

An applicant, the state, an aggrieved property owner or local unit of government may appeal the decision of the local zoning official to the Board of Appeals within 30 days after

NOTE: In such a case, the zoning ordinance would have to be amended through proper procedures.

NOTE: In order for any variance to be granted, the board of adjustment/appeal, must determine if unnecessary hardship has been demonstrated sufficiently to warrant a permit to be issued which is inconsistent with the dimensional standards contained within the ordinance. For example where a lot is too small to place adequate fill around the structure without crossing the property line.

notification of a decision. The decision of the Board of Appeals may be appealed to the appropriate Court within 30 days of notification of a decision.

The following procedures shall be used by the Board of Appeals in hearing disputes concerning the district boundaries shown on the official floodplain zoning map:

1. Where a floodplain district boundary is established, the regional flood elevations or profiles for the point in question shall be the governing factor in locating the district boundary. If no regional flood elevations or profiles are available, other available evidence may be examined.
 2. In all cases, the person contesting the location of the district boundary shall be given a reasonable opportunity to present arguments and technical evidence to the Board of Appeals. Where it is determined that the district boundary is incorrectly mapped, the Board of Appeals shall inform the zoning committee to petition the governing body for a map amendment.
- D. Amendments to the floodplain map and/or ordinance must be approved by the (agency) before such amendments are effective.
- E. Notification of Agency
- The local government shall will furnish the (agency) with a copy of all permits and notices of public hearings for appeals, variances and amendments under a delegation program. The (agency) may waive this requirement for copies of permits in its entirety or by category of structural works.
- F. Monitoring and Enforcement

In cooperation with local governmental units, the (agency) shall conduct, whenever possible, periodic inspections to determine the effectiveness of local floodplain management programs, including an evaluation of the enforcement and compliance with local floodplain management ordinances.

If the agency, after a public hearing, determines that the local government is not properly administering or enforcing its floodplain ordinance, the agency shall notify said local government and if corrective action is not taken within a reasonable time, not to exceed 90 days, the agency shall withdraw the delegation. After such withdrawal the (state agency) shall then be responsible for administering floodplain regulations within the boundaries of said local government.

VIII. Enforcement Sanctions

Every regulated development constructed or maintained in violation of any local floodplain ordinance adopted or approved under this Section is hereby declared to be a public nuisance and the creation thereof may be enjoined and the maintenance thereof may be abated by action of the state, any local unit of government of the state or any citizen thereof.

Scenario 3: STATE REGULATION OF FLOODWAYS [AND COASTAL HIGH HAZARD ZONES]; LOCAL GOVERNMENT REGULATION OF FLOOD FRINGE AREAS

In this model statute, all of scenario 1 above (state regulation) is required, with the following provisions added or amended to allow for the optional takeover of regulations by a local government on the floodplains within their jurisdiction.

In this scenario, it will be necessary to add this section to the duties and powers above Scenario 1, (Section III):

R: Technical Assistance

The (agency) shall provide technical assistance to all local units of government through engineering assistance, model ordinances, data collection, evaluation of permits, training, monitoring of local administration and enforcement and other activities relating to the purposes of this act.

NOTE: When using this scenario, add this paragraph to (Scenario 1, Section V).

Local Government Required to Regulate Flood Fringe

A. Adoption Procedures

All local units of government shall regulate flood fringe areas within their jurisdiction within 6 months after notification from the (agency) that adequate mapping and data are available to identify said floodplains. After data is available and before adoption of local regulations, the (agency), in order to prevent increased flood elevations and protect existing structures and property rights, may order the local government to declare a moratorium on any development in the identified floodplain until adequate regulations are locally adopted and approved by the (agency). The local government shall, within 3 months of the above date, submit an appropriate draft ordinance and adequate floodplain map to the (agency) for approval. If the agency determines that the local government has the resources, expertise and capability to administer such a program and has indicated its intention to administer the program in accordance of the provisions of this Chapter and the guidelines contained in rules adopted by the Agency pertaining to floodplain regulations, it shall, within 30 days of receipt of the ordinance give preliminary approval, or disapproval with identified deficiencies, to the ordinance and map for that local government. Upon completion of the approval process and within the remainder of the 6 month process, the local government shall adopt and/or amend the ordinance and map and thereafter regulate the flood fringe areas within their jurisdiction. Such regulations will be administered in accordance with the provisions provided herein and approved in the local ordinance. No ordinance or amendment shall become effective until approved by the (agency). The local government shall have the authority to collect reasonable fees from applicants for the cost of administering the program.

NOTE: This scenario assumes local units of government already have, or will adopt, as part of this floodplain ordinance, the appropriate administrative framework (zoning committees, Board of Appeals, etc.) to administer zoning ordinances.

NOTE: A moratorium may be necessary to prevent significant adverse impacts on other property owners due to a planned or actual development which would encroach into the floodplain and cause an increase in flood elevations, velocities or coastal erosion rates.

NOTE: The time deadlines presented here are only suggested; it is likely that other state statutes define the ordinance adoption procedures for local units of government. The time deadlines used in the floodplain statute should be consistent with those in other enabling authority.

NOTE: If a local unit of government is found to be incapable of administering an ordinance, the state and locals should seek alternatives, such as; cooperative agreements with other units of government, simple ordinances prohibiting all development in the floodplain, etc.

B. Variances

Any deviation from the standards of the floodplain zoning ordinance, for which a permit has been denied by the zoning administrator, may be allowed only upon; written request for a variance submitted to the zoning administrator, public hearing, and issuance of a variance by the board of appeals. The board may authorize in specific cases such variance from the terms of the ordinance as will not be contrary to the public interest where, owing to special conditions affecting a particular property, a literal enforcement of the provisions of the ordinance would result in unnecessary hardship. A variance:

1. Shall be consistent with the spirit and purpose of the floodplain zoning ordinance.
2. Shall not permit a lower degree of flood protection than the flood protection elevation.
3. Shall not be granted for a use that is common to a group of adjacent lots or premises.
4. Shall not be granted unless it is shown that the variance will not be contrary to the public interest or damaging to the rights of other persons or property values in the area.
5. Shall not be granted for actions which require an amendment to the floodplain zoning ordinance.
6. Shall not have the effect of granting or increasing a use of property which is prohibited in a particular zoning district.
7. Shall not be granted solely on the basis of economic gain or loss.
8. Shall not be granted for a self-created hardship.

NOTE: In such a case, the zoning ordinance would have to be amended through proper procedures.

NOTE: In order for any variance to be granted, the board of adjustment/appeal, must determine if unnecessary hardship has been demonstrated sufficiently to warrant a permit to be issued which is inconsistent with the dimensional standards contained within the ordinance. For example, where a lot is too small to place adequate fill around the structure without crossing the property line.

C. Appeals and Boundary Disputes

An applicant, the state, an aggrieved property owner or local unit of government may appeal the decision of the local zoning official to the Board of Appeals within 30 days after notification of a decision. The decision of the Board of Appeals may be appealed to the appropriate Court within 30 days of notification of a decision.

The following procedures shall be used by the Board of Appeals in hearing disputes concerning the district boundaries shown on the official floodplain zoning map:

1. Where a floodplain district boundary is established, the regional flood elevations or profiles for the point in question shall be the governing factor in locating the district boundary. If no regional flood elevations or profiles are available, other available evidence may be examined.
2. In all cases, the person contesting the location of the district boundary shall be given a reasonable opportunity to present arguments and technical evidence to the (agency). Where it is determined that the district boundary is incorrectly mapped, the agency shall amend the map.

D. Amendments to the floodplain map or ordinance must be approved by the (agency) before such amendments are effective.

E. Notification of Agency

Copies of all local permits, public hearing notices, decisions on appeals, variances and amendments shall be sent to the (agency) which shall have the authority to appeal any such decision as a full party. The (agency) may waive this requirement for copies of permits in its entirety or by category of structural works.

F. Monitoring and Enforcement

In cooperation with local governmental units, the (agency) shall conduct, whenever possible, periodic inspections to determine the effectiveness of local floodplain management programs, including an evaluation of the enforcement and compliance with local floodplain management ordinances.

If the (agency) after a public hearing, determines that the local government is not properly administering or enforcing its floodplain ordinance, the agency shall direct appropriate administration. If corrective action is not taken within a reasonable time, not to exceed 90 days, the agency shall administer the ordinance for the local unit of government and charge the cost of all such administration to the local government. In addition, the cost of the enforcement hearing and adequacy determination shall be charged to the local government.

VIII. Enforcement Sanctions

Every regulated development constructed or maintained in violation of any local floodplain ordinance adopted or approved under this Section is hereby declared to be a public nuisance and the creation thereof may be enjoined and the maintenance thereof may be abated by action of the state, any local unit of government of the state or any citizen thereof.

NOTE: When using this scenario, add this paragraph to (Scenario I, Section V).

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Purpose and Finding

A. The Legislature of the state of _____ finds that recurring floods threaten human life, health and property and that the public interest requires that the floodplain be managed and regulated in order to minimize flood hazards to life, health and property. It is the policy of this state to reduce flood damages and the number of people and structures at risk in flood hazard areas through floodplain management, stressing nonstructural measures such as floodplain zoning, floodproofing, flood warning and acquisition/relocation. The legislature finds that local units of government have the primary responsibility for planning, adoption and enforcement of land use regulations to accomplish floodplain management. Furthermore, they are enabled to adopt and implement comprehensive floodplain management programs that include nonregulatory techniques to accomplish the purposes of this act in cooperation with any federal, state or local agencies.

[...recognizes that recurring coastal floods are aggravated by wind which impacts metastable landforms, often in an unpredictable manner. Variable wave and current processes during changing tide levels offer the greatest threat to life, health and property.]

The purpose of this statute is:

- To protect human life, health and property;
- To preserve floodplains [and coastal high hazard areas] for the purpose of carrying and storing flood waters;
- To reduce the public cost of providing emergency services, flood control structures and rebuilding public works damage by floods;
- To protect the tax base and jobs;
- To reduce the threat of increased damages to existing uses;
- To provide for the orderly development and wise use of floodplains [and coastal high hazard areas];
- To minimize business interruptions;
- To discourage victimization of unwary land and home buyers;
- To preserve the natural functions and resources of the floodplains [and coastal high hazard areas].
- [-to preserve the volume (height and width) and form of dunes, barrier beaches and other natural protective barriers].
- [-to prevent increased flooding and erosion caused by improper development, including construction of seawalls, bulkheads, groins, jetties, filling, grading or mineral extraction.]

11. Definitions

"Agency" or "Department" means (the Natural Resources Agency of the State).

"Amendment" means any change to the official floodway lines, water surface profiles, floodplain zoning maps or text of the floodplain zoning ordinance.

["Barrier beach" means a narrow low-lying strip of land generally consisting of beaches and dunes extending roughly parallel to the trend of the coast and separated from the mainland by a narrow body of fresh, brackish or saline water or a marsh system.]

["Coastal high hazard area" (e.g. V-zone) is a coastal area of special flood hazard that is inundated by the tidal regulatory (100-yr) flood that has additional hazard due to velocity caused by wave action.]

"Development" means any man-made change to improved or unimproved real estate, including but not limited to the construction of buildings, structures or accessory structures, or the construction of additions or substantial improvements to buildings, structures or accessory structures; the placement of mobile homes; mining, dredging, filling, grading, paving, excavation or drilling operations; and the deposition or extraction of materials.

["Dune" means any natural hill, mound or ridge of unconsolidated sediment landward of a beach deposited by wind action or storm overwash; also sediment deposited by artificial means and serving the purpose of storm damage prevention or flood control.]

"Equal degree of hydraulic encroachment" means taking into account the effect of any encroachment into the floodway. It is computed by assuming an equal degree of hydraulic encroachment on the opposite side of a river or stream for a significant hydraulic reach, in order to compute the effect of the encroachment upon hydraulic conveyance. This computation assures that property owners up, down or across the river or stream will have the same rights of hydraulic encroachment. (Also see: Hydraulic reach and floodway lines.)

degree of hydrologic encroachment" means taking into account the effect of any development on the storage capacity of a floodplain area, particularly upstream from urban areas. It is analyzed assuming an equal degree of flood storage for all property owners and subdivided lots in the floodplain area of a floodplain on both sides of a river or stream for the regulated storage area.

"Erosion" - The wearing away of land by the action of natural forces; (on a beach or dune, the carrying away of sediment by wave action, tidal currents, littoral currents or beach deflation.)

"Encroachment" means a general or temporary condition of partial or complete inundation of normally dry land areas caused by the overflow or rise of ocean, streams or lakes, or the unusual and rapid accumulation or runoff of surface waters from any source.

"Flood fringe" is that portion of the floodplain outside of the regulatory floodway (land/or coastal high hazard zone), which is covered by floodwaters during the regulatory flood.

"Floodplain" is the land which has been or may be covered by flood waters, and is surrounded by flood water and inaccessible, during the occurrence of a regulatory flood. The riverine floodplain includes the floodway and flood fringe.

"Floodplain management" - The analysis and integration of the entire range of measures that can be used to prevent, reduce or mitigate flood damage at a given location, and that can protect and preserve the natural, historical, and cultural values of the floodplain.

"Flood profile" is a graph or a longitudinal profile line showing the relationship of the water surface elevation of a flood event to locations and surface elevations along a stream or river.

"Floodproofing" means the modifications of structures, their sites and contents and water and sanitary facilities to keep water out or to reduce the effects of water entry.

"Freeboard Protection Elevation" means an elevation which shall correspond to the elevation of the 1% chance flood (100 yr), plus any increased flood elevation due to floodway encroachment, plus _____ feet of freeboard.

"Floodway" is the channel of the river or stream and those portions of the floodplain adjoining the channel required to discharge and store the flood water or flood flows associated with the regulatory flood.

NOTE: The terms hydraulic and hydrologic can simply be defined as follows:

"hydraulic" means the movement of water through a channel and its adjacent floodplain, and "hydrologic" means the storage of water within the floodplain based on volume. When hydraulic encroachment is involved, water tends to back up causing higher flood levels upstream and when hydrologic encroachment occurs, the storage capacity is reduced causing water to move more quickly through the watershed resulting in higher flood elevations downstream.

NOTE: A state should select freeboard which is adequate to protect against the problems it experiences, e.g. ice jams, etc. Many states use one or two feet.

"Freeboard" - Represents a factor of safety usually expressed in terms of a certain amount of feet above a calculated flood level. Freeboard compensates for the many unknown factors that contribute to flood heights greater than the height calculated. These unknown factors include, but are not limited to, ice jams, debris accumulation, wave action, obstruction of bridge openings and floodways, the effects of urbanization on the hydrology of the watershed, loss of flood storage areas due to development and the sedimentation of a river or stream bed.

["Freeboard" - The additional height of a shore protection structure above design high water level to prevent overflow. Also, at a given time, the vertical distance between water level and the top of the structure.]

["Groin" is a structure built (usually perpendicular to the shoreline) to trap littoral drift or retard erosion of the shore.]

["Jetty" in open sea coasts, is a structure extending into a body of water, and designed to prevent shoaling of a channel by littoral materials, and to direct and confine the stream or tidal flow. Jetties are built at the mouth of a river or tidal inlet to help deepen and stabilize the channel.]

["Littoral drift" means the sedimentary material moved along beaches under the influence of waves and currents.]

["Littoral transport" is the movement of littoral drift along beaches by waves or currents, including movement parallel (longshore transport) and perpendicular (on-offshore transport) to the shore.]

"Local Government" - In the context of this Statute means any county, city or village (or other political subdivision having adequate planning and zoning authority to regulate land use).

["Metastable" means a relatively unstable, transient, but significant state or condition of a physical system such as unconsolidated sediment. Metastable landforms include beaches, dunes and barrier beaches in the coastal zone.]

"Mitigation" means any action that is taken which will reduce the impact, damage or cost of the next flood which occurs.

"Person" means any individual, group of individuals, corporation, partnership, association, political subdivision, public or private agency in the state.

"Regulatory Flood" (or regional or base flood) - Is a flood determined to be representative of large floods known to have generally occurred in the past which may be expected to occur on a particular stream because of physical characteristics. The regulatory flood is based upon a statistical analysis of stream flow records available for the watershed or analysis of rainfall and runoff characteristics in the watershed. In some areas the flood frequency of the regulatory flood is once in every hundred years; this means that in any given year there is a 1% chance a regulatory flood may occur or be exceeded.

These protection structures" include the following:

"Seawall" - A structure separating land and water areas (usually parallel to the shoreline) designed to prevent erosion and other damage due to wave action.

"Bulkhead" - A structure or partition to retain or prevent sliding of the land. A secondary purpose is to protect the upland against damage from wave action.]

"Unconsolidated" means those sediments which remain loosely aggregated and have not been cemented or compressed into solid rock; includes sand, silt, clay, cobbles or shingles.]

"Unnecessary Hardship" means a unique and extreme inability to conform to the provisions of this ordinance due to special conditions affecting a particular property which were not self-created and are not solely related to economic gain or loss. Unnecessary hardship is present only where, in the absence of a variance, no feasible use can be made of the property.

"Variance" means an authorization granted by the board of appeals to construct, alter or use a structure in a manner which is inconsistent with the dimensional standards contained in a local ordinance.

Duties and Powers

The (Natural Resources Agency of the State of _____) shall have the authority and it shall be its duty to:

- A. Coordinate floodplain management activities of local, state and federal agencies.

NOTE: During a typical 30-year mortgage period, the regulatory flood has a 26% chance of occurring or being exceeded. By comparison, that same structure has only a 17% chance of being damaged by fire.

NOTE: A variance may not be used to permit a use of property otherwise prohibited by an ordinance. Unnecessary hardship must be demonstrated by the applicant/property owner before a variance can be granted.

Caution Only those local units of government that have adequate staff and resources should be included. For those reasons, it is recommended that townships usually not be included.

- B. Be the lead state agency to receive federal funds for accomplishing floodplain management activities.
- C. Distribute information and conduct educational activities that will aid the public and other units of government to comply with the requirements of this act; to provide technical assistance for better understanding of flood process and management of uses in the floodplain to accomplish the purposes of this act.
- D. Provide all flood prone local units of government with technical data and maps adequate to support reasonable floodplain regulations and flood hazard mitigation programs. Maps shall delineate the floodplain of the regulatory flood, and where information is available, the floodway and floodfringe portions of the regulatory floodplain. [In coastal areas, projected flood elevations, including anticipated wave heights in the coastal high hazard areas shall be provided to the local units of government.] The (agency) shall review, certify and approve this data and any data developed by other sources as reasonable and accurate.
- E. Minimum Standards

Prepare and promulgate by rule minimum standards for local floodplain regulations to implement this statute. Such minimum standards shall be designed to protect human life, health and property and to preserve the capacity of the floodplain to discharge and store the waters of the regulatory flood [and to preserve natural littoral transport patterns and dune configurations]. Such minimum standards may vary between urban and rural areas and shall account for anticipated development within the watershed in urban areas.

Option - A state may prefer to shorten the list of agency powers by substituting some of the list on the left with the paragraph below :

The Agency is authorized to develop information and data and to distribute it on flooding and the various techniques of floodplain management. The Agency may also assist local units of government in the development of a comprehensive flood damage reduction program including but not limited to programs for the gradual elimination of nonconforming uses and upgrading of nonconforming structures, programs for dealing with impacts of urbanization on hydrology and hydraulics, signing floodplains, acquisition and relocation, flood warning, pre- and post-flood hazard mitigation programs, including assessment of the impact of proposed emergency protection measures, floodproofing, multi-objective planning, regulation and implementation.

When this alternative is used the following powers can be deleted: (L, M, N, O, P & Q).

F. Local Ordinance Approval

The (agency) shall have authority to review and approve all local floodplain ordinances and amendments adopted to meet the minimum standards herein and in duly promulgated rules of the Agency. The Agency shall specify in writing its reasons for disapproval of ordinances or amendments which fail to meet the minimum standards to the agency's satisfaction. Where the existing ordinances such as zoning, building codes, land use regulations or subdivision ordinances meet the minimum standards to the Agency's satisfaction, the Agency may approve these ordinances as adequate floodplain regulations under this statute.

G. Technical Assistance

The (agency) shall provide technical assistance to all local units of government through engineering assistance, model ordinances, data collection, evaluation of permits, training monitoring of local administration and enforcement and other activities relating to the purposes of this act.

H. Monitoring and Enforcement

In cooperation with local governmental units, the (agency) shall conduct, whenever possible, periodic inspections to determine the effectiveness of local floodplain management programs, including an evaluation of the enforcement of and compliance with local floodplain management ordinances.

If the (agency) after a public hearing determines that the local government is not properly administering or enforcing its floodplain ordinance, the agency shall direct appropriate administration. If corrective action is not taken within a reasonable time, not to exceed 90 days, the agency shall administer the ordinance for the local unit of government and charge the cost of all such administration to the local government. In addition, the cost of the enforcement hearing and adequacy determination shall be charged to the local government.

I. Administer the floodplain management program including, but not limited to:

- 1. Establish technical standards for the delineation and mapping of floodplains, floodways [and coastal hazard areas] taking into account existing and anticipated development.

NOTE: This scenario assumes local units of government already have, or will adopt, as part of this floodplain ordinance, the appropriate administrative framework (zoning committees, Board of Appeals, etc.) to administer zoning ordinances.

2. Conduct and/or coordinate engineering studies to determine the vertical and horizontal limits of floodplains, floodways [and coastal high hazard areas].
- J. To serve as the repository for all flood data within this state.
- K. To inspect and investigate all conditions relating to the obstruction or development of floodplains, the agency or its duly appointed representative shall have the right to enter at all reasonable times in or upon any private or public land for the purposes of inspection and investigation.
- L. Assist local governments and other state agencies to develop comprehensive floodplain management programs.
- M. Develop programs that address nonconforming uses and structures within the state's floodplains which will result in the gradual phase out of those nonconforming uses and the gradual conversion of nonconforming structures to floodproofed or flood protected structures through a program of relocation and/or floodproofing.
- N. Mark the floodplains of the state to show elevations reached by historic flood(s) so property owners may be aware of the potential for flooding on any given property.
- O. Develop programs/procedures to acquire structures in flood prone areas that will result in an ultimate reduction in cost to the taxpayers and to preserve or restore the natural values of floodplain resources.

Example - A state may wish to add floodproofing standards in statewide building codes or to require all subdivision plats display flood elevations, floodway lines [and coastal high hazard boundaries for V-Zones] and require that subdivisions in urban areas have detention basins to prevent runoff from being "increased" above predevelopment conditions during a flood. Further, this could include planning and implementation of flood hazard mitigation programs.

NOTE: States considering the adoption of acquisition programs should review the existing acquisition programs in place in other states - see the section of these model statutes entitled "Innovative and/or incentive programs to reduce flood damages."

- P. Develop data and promulgate minimum regulations that will account for the effects of urbanization that lead to increased runoff, increased flood elevations [and increased coastal erosion] which threaten existing and future development.
- Q. Work in cooperation with federal, state or local agencies in the development of flood warning systems, evacuation plans and flood emergency preparedness plans for the purpose of reducing damages and the threat to life and property.
- R. Enforce the provisions of this act including the rules and regulations duly promulgated.
- S. Accomplish all other activities that are necessary and lawful in order to meet the purposes of this act.

Local Governments to Adopt Floodplain Zoning Ordinances

- A. Adoption Procedures
- Within 6 months after notification from the (agency) that adequate mapping and data are available to identify the floodplains, each local government shall adopt a floodplain map and ordinance which meet or exceed the minimum standards of this act and of the rules established by the Agency. The local government has responsibility and authority to regulate all mapped and unmapped floodplains within their jurisdiction. Nothing in this act shall prohibit a local government from adopting more restrictive standards than those contained in the minimum state regulations.

NOTE: This general subject is commonly referred to as "stormwater management" and is becoming increasingly popular for use by local or regional governments in rapidly urbanizing areas to prevent increased flood damages.

After data are available and before adoption of local regulations, the agency, in order to prevent increased flood elevations and protect existing structures and property rights, may order the local government to declare a moratorium on any development in the identified floodplain until adequate regulations are locally adopted and approved by the (agency). The local government shall, within 3 months of the above date, submit an appropriate draft ordinance and adequate floodplain map to the (agency) for approval. If the agency determines that the local government has the resources, expertise and capability to administer such a program and has indicated its intention to administer the program in accordance of the provisions of this Chapter and the guidelines contained in rules adopted by the Agency pertaining to floodplain regulations, it shall, within 30 days of receipt of the ordinance give preliminary approval, or disapproval with identified deficiencies, to the ordinance and map for that local government. Upon completion of the approval process and within the remainder of the 6 month process, the local government shall adopt and/or amend the ordinance and map and thereafter regulate the floodplain areas within their jurisdiction. Such regulations will be administered in accordance with the provisions provided herein and approved in the local ordinance. No ordinance or amendment shall become effective until approval by the (agency). The local government shall have the power to collect reasonable fees from applicants for the cost of administering the program.

B. Variances

Any deviation from the standards of the floodplain zoning ordinance, for which a permit has been denied by the zoning administrator, may be allowed only upon; written request for a variance submitted to the zoning administrator, public hearing, and issuance of a variance by the board of appeals. The board may authorize in specific cases such variance from the terms of the ordinance as will not be contrary to the public interest where, owing to special conditions affecting a particular property, a literal enforcement of the provisions of the ordinance would result in unnecessary hardship. A variance:

NOTE: A moratorium may be necessary to prevent significant adverse impacts on other property owners due to a planned or actual development which would encroach into the floodplain and cause an increase in flood elevations, velocities or coastal erosion rates.

NOTE: The time deadlines presented here are only suggested; it is likely that other state statutes define the ordinances adoption procedures for local units of government. The time deadlines used in the floodplain statute should be consistent with those in other enabling authority.

NOTE: If a local unit of government is found to be incapable of administering an ordinance, the state and locals should seek alternatives, such as; cooperative agreements with other units of government, simple ordinances prohibiting all development in the floodplain, etc.

1. Shall be consistent with the spirit and purpose of the floodplain zoning ordinance.
2. Shall not permit a lower degree of flood protection than the flood protection elevation.
3. Shall not be granted for a use that is common to a group of adjacent lots or premises.
4. Shall not be granted unless it is shown that the variance will not be contrary to the public interest or damaging to the rights of other persons or property values in the area.
5. Shall not be granted for actions which require an amendment to the floodplain zoning ordinance.
6. Shall not have the effect of granting or increasing a use of property which is prohibited in a particular zoning district.
7. Shall not be granted solely on the basis of economic gain or loss.
8. Shall not be granted for a self-created hardship.

NOTE: In such a case, the zoning ordinance would have to be amended through proper procedures.

NOTE: In order for any variance to be granted, the board of adjustment/appeal, must determine if unnecessary hardship has been demonstrated sufficiently to warrant a permit to be issued which is inconsistent with the dimensional standards contained within the ordinance. An example, where a lot is too small to place adequate fill around the structure without crossing the property line.

C. Appeals and Boundary Disputes

An applicant, the state, an aggrieved property owner or local unit of government may appeal the decision of the local zoning official to the Board of Appeals within 30 days after notification of a decision. The decision of the Board of Appeals may be appealed to the appropriate Court within 30 days of notification of a decision.

The following procedures shall be used by the Board of Appeals in hearing disputes concerning the district boundaries shown on the official floodplain zoning map:

1. Where a floodplain district boundary is established, the regional flood elevations or profiles for the point in question shall be the governing factor in locating the district boundary. If no regional flood elevations or profiles are available, other available evidence may be examined.
2. In all cases, the person contesting the location of the district boundary shall be given a reasonable opportunity to present arguments and technical evidence to the Board of Appeals. Where it is determined that the district boundary is incorrectly mapped, the Board of Appeals shall inform the zoning committee to petition the governing body for a map amendment.

D. Amendments to the floodplain map or ordinance must be approved by the (agency) before such amendments are effective.

E. Notification of Agency

Copies of all local permits, public hearing notices and decisions on appeals, variances and amendments shall be sent to the (agency) which shall have the authority to appeal any such decision as a full party. The (agency) may waive the requirement for copies of permits in its entirety or by category of structural works.

V. Enforcement Sanctions

A. Every regulated development constructed or maintained in violation of any local floodplain ordinance adopted or approved under this Section is hereby declared to be a public nuisance and the creation thereof may be enjoined and the maintenance thereof may be abated by action of the state, any local unit of government of the state or any citizen thereof.

B. A violation of an approved local floodplain ordinance and is also a violation of this statute and may be punished by a fine of not less than \$ _____ or no more than \$ _____ or a sentence of not less than _____ days or no more than _____ days in jail. Each day of violation is a separate offense.

VI. Saving Clause

If any part of this act is found to be unconstitutional---etc.

1057H

NOTE: The classification of a violation as civil/criminal, misdemeanor/felony, etc., should be carefully determined in each state to result in the best institutional enforcement strategy.

NOTE: In any state this may or may not be necessary depending upon other statutory provisions.

Examples of Innovative Techniques

The draft statutes preceding this discussion deal with establishing a regulatory framework for flood plain management. While the regulatory approach has been shown to be effective in reducing flood damages of new development; it has been shown to be very ineffective in dealing with existing development. Given then, that the regulatory approach is the "central theme" of a state's flood plain management program, what are the nonregulatory techniques that can be utilized to reduce the damage potential to existing flood plain development? Are there incentives and other innovations that go beyond basis regulations?

This section deals with supplemental techniques that have been adopted in a variety of states. They are intended to illustrate the application of a concept. States who are considering these approaches are urged to develop an appropriate level of specificity and ensure proper coordination with other elements of the states' zoning, building code and resource management enabling laws.

Supplemental techniques chosen for inclusion are as follows:

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COST-SHARING TO PROVIDE
BETTER MAPS FOR MANAGEMENT

Reducing Future Flood Damages by:

- Improving maps during study process (Colorado)
- Improving maps as needed (Wisconsin)

A prerequisite to the application of many flood damage reduction techniques is the delineation of the flood hazard area on a map. The flood insurance study and maps are the basis for most flood plain regulatory programs. Unfortunately, the standardization of these maps has reduced their usefulness for local management programs where site-specific decisions have to be made as these maps frequently lack physical detail and contour elevation data. The States of Colorado and Wisconsin have taken steps to provide a mechanism to develop better mapping. In Colorado, a state appropriation is used to set up a "piggy-back" contract with the flood insurance study contractor so that the maps produced in the flood insurance study process are at a better scale and on an adequate base for local management process. The enabling statute broadly authorizes:

AUTHORIZING COLORADO WATER CONSERVATION BOARD
TO COORDINATE ALL ACTIVITIES RELATING TO THE DESIGNATION OF
FLOODPLAINS IN THE STATE IN CONNECTION WITH LAND USE PLANNING

§ 24-65.1-603 which amends the State's land use act.

Technical and Financial Assistance

Any local government applying for Federal or State financial assistance for Floodplain studies shall provide notification to Colorado Water Conservation Board. The Board shall coordinate and prescribe the standards for all Floodplain studies conducted pursuant to this article, including those conducted by Federal, local or other State agencies, to the end that reasonable uniform standards shall be applied to the identification and designation of all Floodplains within the State and to minimize duplication of effort.

The Wisconsin approach is independent of the flood insurance study process and authorizes funds for 50/50 state cost-sharing with local units of government to develop better mapping.

Wisconsin Statutes 87.31 Flood plain and shoreland mapping assistance program. (1) DEPARTMENT TO ADMINISTER; PURPOSE. The department shall administer a flood plain and shoreland mapping assistance program to provide counties, cities and villages with financial assistance to produce adequate topographical mapping of flood plain and shoreland areas and to delineate flood plain and floodway boundaries, to assist in the establishment and administration of flood plain and shoreland ordinances.

(2) CRITERIA. The department shall develop on a statewide basis a priority list for awarding mapping grants. The criteria for establishing the priority list includes but is not limited to:

- (a) The adequacy of existing mapping.
- (b) The existence of an approved flood plain or shoreland zoning ordinance.
- (c) The status of studies to develop flood profiles for the areas to be mapped.

- (d) The potential for future development in the areas to be mapped.
- (e) The potential for flood damage in the areas to be mapped.
- (f) Applications made by 2 or more counties, cities or villages which would enable mapping of an entire river system.
- (g) The availability of funds for mapping from other sources.

(3) PROCEDURE. The department shall establish by rule the procedure for application for and awarding of mapping grants.

(4) APPLICATION. A county, city or village which seeks a mapping grant shall submit grant application which includes:

- (a) The location, length and extent of the river or shorelands to be mapped.
- (b) The estimated cost of and time required to complete the proposed mapping.
- (c) The information necessary to determine the priority of the application under sub. (2).
- (d) A statement that the applicant will assume responsibility for administering any subcontracts with mapping contractors.
- (e) A statement that the applicant will adopt the resultant map, if approved by the department, as the official zoning map and any necessary ordinances or amendments within 6 months after the department approves the map.
- (f) Any other information required by rule by the department.

(5) GRANTS. (a) The department shall make grants-in-aid from the appropriation under s. 20.370 (4)(fc) to a county, city or village which qualifies under the mapping grant program. A grant-in-aid may not exceed 50% of the expected cost of the topographical mapping.

(b) Upon approval by the department and acceptance by the applicant, the department may make available 75% of the mapping grant award. The department shall make available the remaining 25% of the mapping grant at the time the applicant adopts the resultant map as approved by the department as the official zoning map and any necessary ordinances and amendments.

(c) A grant is valid for one year after the date of acceptance but the department may extend this period up to 3 years if warranted by the circumstances.

(6) FAILURE TO ADOPT MAP. If a mapping grant recipient fails to adopt the map as the official zoning map or fails to adopt any necessary ordinances or amendments within 6 months after the department approves the map without adequate justification as determined by the department, the recipient may not receive any further state funds under the mapping grant program and shall be required to reimburse the department for state funds already received under the program.

History: 1979 c. 34.

Reducing Future Flood Damages by:

The New York Example

The activities of public agencies should not be allowed to run counter to the expressed public policy of reducing future flood damages. The actions of state and local agencies should be governed by the same technical and regulatory standards that apply to private actions. The regulation of public actions can be done by executive order, regulation or by statute. Experience has shown that the preferable approach is by statute. A section of the New York statute is presented below. It should be noted that the flood plain management agency is directed to assist other state agencies in determining and evaluating flood hazards.

New York Statutes § 36-0111

1. State agencies shall take affirmative action to minimize flood hazards and lossess in connection with state-owned and state-financed buildings, roads and other facilities, the disposition of state lands and properties, the administration of state and state-assisted planning programs, and the preparation and administration of state building, sanitary and other pertinent codes. Such action shall include but not be limited to, requirements for the evaluation and reduction of flood hazards in the siting, planning, construction and maintenance of such facilities and the administration of such programs: needed and economically feasible flood proofing and other protective measures of existing state facilities; and appropriate flood hazard restrictions binding upon purchaser, and persons acquiring state lands and properties, or interests therein, and their successors.

2. The commissioner shall assist state agencies in determining and evaluating flood hazards and alternative protective measures, and shall establish standards and procedures to govern the review by the commissioner of potential flood hazards at proposed construction sites of state, and state financed facilities. Such standards and procedures shall become effective upon their approval by the directors of the division of the budget and the office of planning services and shall ensure that reviews thereunder shall be coordinated with those of appropriate environmental impact statements, project notification and review systems, and state capitol construction funding requests.

Chapter 839, 1974

ESTABLISHING SUITABLE TECHNICAL
STANDARDS

Reducing Future Flood Damages by:

Stream encroachment lines (Connecticut)
Broad mapping statute (New Jersey)
Flood plain delineation standards (Montana)

Experience has shown that a set of federal "minimum" standards, be they for technical or regulatory purposes, will be suitable for application in all parts of the country. It is, therefore, necessary that the state establish technical standards which form the basis for the flood plain delineation program which is tailored to meet the flooding characteristics of that state. It is assumed that accepted engineering practices would always be employed.

The New England states recognized the importance of technical standards very early. In the 1950's, Connecticut pioneered the establishment of encroachment standards with its Stream Channel Encroachment Line Program.

Connecticut Statutes Sec. 25-4a. Establishment of stream channel encroachment lines. The *** COMMISSIONER shall establish, along any waterway or flood-prone area considered for stream clearance, channel improvement or any form of flood control or flood alleviation measure, lines beyond which, in the direction of the waterway or flood-prone area, no obstruction or encroachment shall be placed by any person, firm or corporation, public or private unless authorized by said *** COMMISSIONER. The *** COMMISSIONER shall issue or deny permits upon applications for establishing such encroachments based upon *** HIS findings of the effect of such proposed encroachments upon the flood-carrying capacity of the waterways, flood heights and hazards to life and property, with due consideration given to the results of similar encroachments constructed along the reach of waterways. (1971, P.A. 872, S. 45.)

Sec. 25-4b. Determination of lines. The *** COMMISSIONER in establishing such encroachment lines, shall base their location on the boundaries of the area which would be inundated by a flood similar in size to one or more recorded floods which have caused extensive damages in such area or on a size of flood computed by accepted methods applicable generally throughout the state or a region thereof. The determination of the size of the flood and the boundaries of the inundated area shall take into consideration the effects or probable future developments. The position of the lines may vary from the boundaries of the inundated area so as to minimize the area of land to be regulated when a portion of the inundated area does not contribute to the flood-carrying capacity of the waterway. The position of the lines shall, insofar as practical, equitably affect riparian properties and interests depending upon existing topography and shall be interdependent throughout the reaches of the waterway, and shall conform with the requirements of the federal government imposed as conditions for the construction of flood control projects. When the existing waterway, because of natural or man-made constrictions, is such that such lines cannot be established by standard engineering methods, a channel may be adopted, whereby the removal of such constrictions may be anticipated so that reasonable lines can be established by methods applicable to the state generally. When the flood boundary falls along the channel banks, the lines shall be placed at the top of the bank. (1971, P.A. 872, S.46).

The New Jersey statute has been selected to demonstrate a less-detailed approach to a delineation program. The statute authorizes the administering agency to adopt specificity in rules and regulations.

58:16A-52. Delineation of flood hazard areas.

- a. The department shall study the nature and extent of the areas affected by flooding in the State. After public hearing upon notice, and pursuant to the "Administrative Procedure Act," P.L. 1968, c.410 (C. 52:14B-1 et seq.), the department shall adopt rules and regulations which delineate as flood hazard areas such areas as, in the judgment of the department, the improper development and use of which would constitute a threat to the safety, health, and general welfare from flooding. Such delineations shall identify the various subportions of the flood hazard area for reasonable and proper use according to relative risk, including the delineation of floodways necessary to preserve the flood carrying capacity of natural streams. The department may, after public hearing notice and pursuant to the aforementioned "Administrative Procedure Act," revoke, amend, alter or modify such regulations if in its judgment the public interest so warrants.
- b. The department shall wherever practicable, make floodway delineations identical to the floodway delineations approved by the Federal Government for the National Flood Insurance Program.
- c. The department shall establish a procedure for reducing any delineated flood hazard area when a change has been made which increases the flood carrying capacity of the concerned stream at this location.

Montana and Nebraska have adopted similar state delineation standards which have detailed administrative procedures. States should use discretion in determining the level of specificity needed in their statutes. The enabling language from the Montana statute follows:

Montana Statutes § 89-3504. Program for delineation of floodplains and floodways--land-use regulations. (1)(a) The department shall initiate a comprehensive program for the delineation of designated floodplains and designated floodways for every watercourse and drainway in the state. It shall make a study relating to the acquiring of flood data, and may enter into arrangements with the United States geological survey, the United States army corps of engineers or any other state or federal agency for such acquisition.

(b) Before the board establishes by order a designated floodplain or a designated floodway, the department shall consult with the affected political subdivisions. Consultation shall include, but not be limited to, the following:

- (i) specifically requesting that the political subdivisions submit pertinent data concerning flood hazards, including flooding experiences, plans to avoid potential hazards, estimates of economic impacts of flooding on the community, both historical and prospective, and such other data as considered appropriate;

(ii) notifying local officials, including members of the county commission, city council and planning board, of the progress of surveys, studies and investigations and of proposed findings, along with information concerning data and methods employed in reaching such conclusions; and

(iii) encouraging local dissemination of information concerning surveys, studies and investigations, so that interested persons will have an opportunity to bring relevant data to the attention of the department.

(2) When sufficient data has been acquired by the department, the board shall establish, by order, after a public hearing, the designated flood plain within which a political subdivision may establish land-use regulation. When sufficient data has been acquired, the board shall establish, by order, after a public hearing, the designated floodway within which a political subdivision may establish land use regulation. These designations shall be based upon reasonable hydrological certainty. When the designated floodplain or the designated floodway has been established, the department shall furnish this data to officials of the political subdivision having jurisdiction over those areas together with a map outlining the areas involved, a copy of this act adopted rules of the board, and suggested minimum standards adopted by the board. These standards and rules shall reflect gradation in flood hazard based on criteria as outlined in section 89-3507(2). In adopting these standards, rules and regulations, the board shall consider local input from the affected political subdivisions. The department shall record all designated floodplains or designated floodways established by the board in the office of the county clerk and recorder of each county in which those floodplains or floodways are found. The board may alter the floodplains or floodways at any later time, by order, after a public hearing if a re-evaluation of the then available flood data warrants it. Notice of a hearing or order of the board establishing or altering the floodplains or floodways shall be given by publishing the notice once each week for three (3) consecutive weeks in a legal newspaper published or of general circulation in the area involved, the last publication of which shall be not less than ten (10) days prior to the date set for the hearing or the effective date of the order.

ACQUISITION AND RELOCATION

Reducing Future Flood Damages by:

Acquisition authority at local level (Maryland)
Acquisition and land exchange at state level (Arizona)
Creating a state acquisition fund (Florida)

The ability of the regulatory approach for reducing flood damages to existing development is limited. The value of the regulatory approach can be greatly enhanced if the administering agency has the authority and funds to acquire and relocate/demolish structures in flood plains. It is likely that such authorities exist for other resource management programs, e.g. park and recreation purposes, but experience has shown that specificity is needed to define acquisition for flood damage reduction as being a goal of the state.

Structures that could benefit the most from a acquisition program fall into two general categories:

- 1) Those in hazardous areas where the application of the regulatory program causes a severe impact on the individuals who reside there. These problems can result in economic hardships, neighborhood blight and have political consequences.
- 2) Those which have just suffered significant damage from a flood. In the post-disaster setting, if the opportunity exists to more quickly (before rehabilitation begins) to provide financial support, damaged property can be purchased and the flood prone land converted to open space uses. Disaster payments, through the flood insurance policy, etc., can assist in these efforts. A strong local land use program and financial program are needed to spell success.

The Maryland statute illustrates one approach to authorizing acquisition:

Maryland Statutes § 8-9 A-05

(d) Each subdivision, in cooperation with the departments of Natural Resources, State Planning, Agriculture and other appropriate State agencies shall prepare a flood management plan based upon an evaluation of the alternative management techniques and other findings INCLUDED IN STUDIES CONDUCTED UNDER subsection (b). Each flood management plan shall be consistent with the purposes of this subtitle.

Management techniques may include:

Flood control dams;
Levees and dikes
Stormwater detention or retention structures;
Flood warning systems;
Public acquisition;
Flood proofing;
Storm drain and stream maintenance;
Tax adjustment policies;
Subdivision, zoning and related ordinances and other practical methods.

A particularly innovative approach is that authorized by statute in Arizona. This approach takes into account the fact that future public purchase of property must be sensitive to public perception as to the desirability of taking land from the private sector to the public sector. The Arizona approach, in essence, is to trade state-owned non-flood prone land for privately-owned flood prone land. The statute is reproduced in its entirety to demonstrate some of the administrative details. Innovative approaches of this type will undoubtedly have widespread application in many areas of the country.

AN ACT

RELATING TO MILITARY AFFAIRS AND EMERGENCY SERVICES; PROVIDING AUTHORITY FOR THE DIRECTOR OF THE DIVISION OF EMERGENCY SERVICES TO PURCHASE LAND TO SUPPORT FLOOD RELOCATION AND LAND EXCHANGE; PROVIDING FOR CONDEMNATION OF LAND; PRESCRIBING USE OF FLOODPLAIN LAND EXCHANGE FUND, AND AMENDING SECTIONS 26-322 AND 37-610.01, ARIZONA REVISED STATUTES.

Be it enacted by the Legislature of the State of Arizona:
Section 1. Section 26-322, Arizona Revised Statutes, is amended to read:

Arizona Statutes § 26-322. Determination of eligibility for flood relocation and land exchange

- A. The governing board shall petition the director to designate a specific land area within a floodplain as eligible for flood relocation assistance and exchange for state land pursuant to section 37-610 if five or more residents, businesses or combination of both from such area so requested the governing board in writing and if the requirements of subsection B of this section are met.
- B. Before petitioning the director, the governing board shall determine that:
1. A majority of the residents and businesses located in the specific area of the floodplain have signed a petition with the governing board requesting relocation.
 2. A suitable parcel of state land or a parcel of land held by another governmental entity is available within a reasonable distance from the floodplain area, not to exceed twenty-five miles, which is capable of supporting those who wish to relocate on such parcel of land.
- C. The director shall determine the eligibility of a floodplain area for flood relocation assistance. Eligibility shall occur only if all of the following apply:
1. The area is in a floodplain, as certified by the Arizona water commission.
 2. There is no approved or authorized flood control project which would, upon completion, protect the area as certified by the Arizona water commission.
 3. There are funds available in the floodplain land exchange fund to compensate the state trust for the estimated amount of exchanges involving private land valued less than the state land for which it is exchanged OR FOR THE PURCHASE OF AN AVAILABLE PARCEL OF STATE LAND, STATE TRUST LAND OR OTHER PUBLIC OR PRIVATE LAND AS PRESCRIBED BY SUBSECTION E OF THIS SECTION. The director shall obtain certification from the state land department that such funds are available.

4. There are funds from federal, state and local sources for support of the relocation process.

D. If it is determined by the governing board pursuant to subsection B, paragraph 2 of this section that a parcel of land held by a governmental entity other than the state is available for exchange, the director shall attempt to secure such land for the relocation program.

E. THE DIRECTOR MAY PURCHASE LAND TO SUPPORT THE RELOCATION USING FUNDS FROM THE FLOODPLAIN LAND EXCHANGE FUND IF HE DETERMINES, IN CONSULTATION WITH THE STATE LAND COMMISSIONER, THAT THE PURCHASE IS IN THE BEST INTEREST OF THIS STATE. IF THE DIRECTOR SO DETERMINES, HE MAY EXCHANGE THE PURCHASED LAND WITH LAND BELONGING TO RESIDENTS IN FLOODPLAIN AREAS.

F. IF PRIVATE LAND WITHIN SUCH A FLOODPLAIN IS NOT EXCHANGED TO THIS STATE PURSUANT TO THIS SECTION, THE DIVISION MAY, UPON THE DETERMINATION OF THE DIRECTOR, CONDEMN SUCH LAND.

Sec. 2. Section 37-610-01, Arizona Revised Statutes, is amended to read:

37-610.01. Floodplain land exchange fund

There is established a floodplain land exchange fund. The monies of such fund may be used by the department for condemnation of private lands within a floodplain pursuant to section 37-610, subsection G, for payment into the state trust of monies necessary to compensate the trust for any exchange involving private land valued less than the state land for which it is exchanged OR FOR THE PURCHASE OF LAND BY THE DIRECTOR OF THE DIVISION OF EMERGENCY SERVICES TO SUPPORT RELOCATION ACTIVITIES PURSUANT TO SECTION 26-322, SUBSECTIONS E AND F. The auditor general shall annually prepare an audit on such fund and shall forward a copy of such report to the joint legislative budget committee within ninety days following the close of the fiscal year.

Sec. 3. Intent regarding termination

Notwithstanding the provisions of this act, the legislature intends that if the provisions of title 41, chapter 20, Arizona Revised Statutes, operate to terminate an agency, any provisions regarding powers, duties, functions or personnel added or amended by this act terminate on the date of termination of the particular agency.

Sec. 4. Emergency

To preserve the public peace, health and safety it is necessary that this act become immediately operative. It is therefore declared to be an emergency measure, to take effect as provided by law.

The State of Florida has recently enacted an acquisition statute which is particularly interesting in that it defines a source of funding. Provision is made to create and Water Management Lands Trust Fund. The funds are dedicated from a portion of certain deed taxes and are to be used by the five water management districts for the acquisition of lands necessary for water management, water supply and the conservation and protection of water resources. This statute is reproduced as follows:

CHAPTER 81-33

Committee Substitute for Senate Bill No. 620

An act relating to the excise tax on documents; amending s. 201.02(1), Florida Statutes; increasing tax on certain documents; amending s. 201.15, Florida Statutes; providing for distribution of taxes collected; creating s. 373.590, Florida Statutes; creating the Water Management Lands Trust Fund in the Department of Environmental Regulation; directing the secretary of the Department of Environmental Regulation to allocate moneys from the fund to the five water management districts for the acquisition of certain lands; providing for other disposition of moneys in the fund and lands acquired; providing for future repeal; providing effective dates.

Be It Enacted by the Legislature of the State of Florida:

Section 1. Subsection (1) of section 201.02, Florida Statutes, is amended to read:

201.02 Tax on deeds and other instruments relating to lands, etc.--

(1) On deeds, instruments, or writings whereby any lands, tenements, or other realty, or any interest therein, shall be granted, assigned, transferred, or otherwise conveyed to, or vested in, the purchaser, or any other person by his direction, on each \$100 of the consideration therefor the tax shall be 45 40 cents. When the full amount of the consideration for the execution, assignment, transfer, or conveyance is not shown in the face of such deed, instrument, document, or writing, the tax shall be at the rate of 45 40 cents for each \$100 or fractional part thereof of the consideration therefor.

Section 2. Section 201.15, Florida Statutes, is amended to read:

201.15 Distribution of taxes collected.--All taxes collected under the provisions of this chapter shall be distributed as follows:

(1) Seventy-nine point five percent ~~six-sevenths~~ of the total taxes collected under the provisions of this chapter shall be paid into the State Treasury to the credit of the General Revenue Fund of the state, to be used and expended for the purposes for which said General Revenue Fund was created and exists by law.

(2) Thirteen point three percent ~~one-seventh~~ of the total taxes collected under the provisions of this chapter shall be paid into the State Treasury to the credit of the Land Acquisition Trust Fund. Sums deposited in such fund pursuant to this section may be used for any purpose for which funds deposited in the Land Acquisition Trust Fund may lawfully be used and may be used to pay the cost of the collection and enforcement of the tax levied by this chapter.

(3) Seven point two percent of the total taxes collected under the provisions of this chapter shall be paid into the State Treasury to the credit of the Water Management Lands Trust Fund. Sums deposited in that fund may be used for any purpose authorized in s. 373.590, and may be used to pay the cost of the collection and enforcement of the tax levied by this chapter.

Section 3. Section 373.590, Florida Statutes, is created to read:

373.590 Water Management Lands Trust Fund.--

(1) There is established within the Department of Environmental Regulation the Water Management Lands Trust Fund, to be used as a

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nonlapsing fund for the purposes of this section. The moneys in this fund are hereby continually appropriated for the purpose of acquiring land in accordance with the provisions of this section.

(2) Each district shall file a 5-year plan for acquisition with the Legislature and the secretary by January 15, 1982. Annually thereafter each district shall file with the Legislature and the secretary a report of acquisition activity together with modifications or additions to its 5-year plan of acquisition. Expenditure of moneys from the Water Management Lands Trust Fund shall be limited to the acquisition costs of lands included within the plan as filed by each district.

(a) Prior to July 15, 1982, the use of moneys from the fund shall be limited to the following land acquisitions:

1. By South Florida Water Management District--lands in the water conservation areas and areas adversely affected by raising water levels of Lake Okeechobee in accordance with present regulation schedules, and the Savannahs Wetland area in Martin County and St. Lucie County.

2. By Southwest Florida Water Management District--lands in the Four River Basins areas, including Green Swamp, Upper Hillsborough and Cypress Creek, Anclote Water Storage Lands (Starkey), Withlacoochee and Hillsborough riverine corridors, and Sawgrass Lake addition.

3. By St. Johns River Water Management District--Seminole Ranch, Latt Maxey and Evans properties in the upper St. Johns River Basin.

4. By Suwannee River Water Management District--lands in Suwannee River Valley.

5. By Northwest Florida Water Management District--lands in the Choctawhatchee and Apalachicola River Valleys.

(b) After July 15, 1982, the use of moneys from the fund shall be used for continued acquisition of lands listed above and as set forth in the districts' 5-year land acquisition plan.

(3) Moneys from the Water Management Lands Trust Fund shall be used for acquiring the fee or other interest in lands necessary for water management, water supply and the conservation and protection of water resources, except that such moneys shall not be used for the acquisition of rights-of-way for canals or pipelines. Lands acquired with moneys from the fund shall be managed and maintained in an environmentally acceptable manner, and to the extent practicable, in such a way as to restore and protect their natural state and condition. The secretary of the Department of Environmental Regulation shall release moneys from the Water Management Lands Trust Fund to the districts following receipt of a resolution adopted by the governing board identifying the lands being acquired and certifying that such acquisition is consistent with the plan of acquisition and other provisions of this act.

(4) Water management land acquisition costs shall include payments to owners, and costs and fees associated with such acquisition.

(5) The state-to-district ratio for funding of water management land acquisition shall be 4 to 1 except that the first \$2 million of the moneys allocated to the district annually shall be exempt from the matching requirement. Any unused portion of a district's share of the fund shall accumulate in the trust fund to the credit of that district. Interest earned on such portion shall also accumulate to the credit of that district to be used for land acquisition as provided in this section. The total moneys over the life of the fund available to any district under this section shall not be reduced except by resolution of

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the district governing board stating that the need for the moneys no longer exists.

(6) Moneys from the Water Management Lands Trust Fund shall be available to the five water management districts in the following percentages:

- (a) Thirty percent to the South Florida Water Management District.
- (b) Twenty-five percent to the Southwest Florida Water Management District.
- (c) Twenty-five percent to the St. Johns River Water Management District.
- (d) Ten percent to the Suwannee River Water Management District.
- (e) Ten percent to the Northwest Florida Water Management District.

(7) Moneys in the fund not needed to meet current obligations incurred under this section shall be transferred to the State Board of Administration, to the credit of the fund, to be invested in the manner provided by law. Interest received on such investments shall be credited to the fund.

(8) Lands acquired for the purposes enumerated in this section shall also be used for general public recreational purposes which are not inconsistent with subsection (3).

(9) A district may dispose of land acquired under this section, pursuant to s. 373.089. However, revenue derived from such disposal may not be used for any purpose except the purchase of other lands meeting the criteria specified in this section.

Section 4. The tax increase imposed by section 1 of this act is repealed effective July 1, 1991, and the tax rate shall be reduced to 40 cents for each \$100 or fractional part thereof of the consideration. The change in the schedule of distributions imposed by section 2 of this act is repealed effective August 1, 1991, at which time the schedule of distributions shall revert to the schedule existing at the time of passage of this act.

Section 5. Section 373.590, Florida Statutes, is repealed effective July 1, 1992. Any unobligated moneys remaining in the Water Management Lands Trust Fund on the date of the repeal of that section shall be deposited in the General Revenue Fund.

Section 6. This act shall take effect July 1, 1981, except section 2 shall take effect August 1, 1981.

Approved by the Governor June 5, 1981.

Filed in Office Secretary of State June 8, 1981.

* This public document was promulgated at a base cost of \$17.28 per *
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* of informing the public of Acts passed by the Legislature. *

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INCENTIVES OF NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

Reducing Future Flood Damages by:

- Local participation required upon federal designation (Pennsylvania)
- Local participation required upon state designation (Minnesota)

Several states have seen fit to mandate community participation in the NFIP. This permits occupants of flood plains to assume some of the financial responsibility for their decision to live in flood plains. This may have additional benefits for future hazard mitigation opportunities in that only if an occupant has flood insurance will certain funds be available to reduce the future potential for flood damage by either acquisition or flood proofing. The appropriate sections from the Pennsylvania and Minnesota Statute are presented below.

CHAPTER 2 MUNICIPAL PARTICIPATION IN NATIONAL FLOOD INSURANCE PROGRAM

Pennsylvania Statute Section 201. Required participation in National Flood Insurance Program.

(a) Each municipality which has been notified by the United States Department of Housing and Urban Development that it has been identified as having an area or areas which are subject to flooding shall participate in the National Flood Insurance Program.

(b) If a municipality with an area or areas subject to flooding is not participating in the National Flood Insurance Program at the time this act becomes effective, such municipality shall apply for eligibility and fully comply with the requirements for participation within six months of the effective date of this act, or six months from the date of notification by the United States Department of Housing and Urban Development that it has been identified as having an area or areas subject to flooding, whichever is first.

(c) If a municipality, for whatever reason, is suspended from the National Flood Insurance Program, once having gained eligibility, such municipality shall regain eligibility within 90 days of the date of receipt of its notice of suspension.

Section 202. Adoption of flood plain management regulations.

Each municipality which has been identified by the United States Department of Housing and Urban Development as having an area or areas subject to flooding, shall adopt such flood plain management regulations, and amendments thereto, as are necessary to comply with the requirements of the National Flood Insurance Program within six months after a flood plain map is approved or promulgated for the municipality by the United States Department of Housing and Urban Development.

Minnesota Statute § 104.08 Flood Insurance. Subdivision 1. It is the policy of the state of Minnesota that all local governmental units subject to recurrent flooding participate in the national flood insurance program, Public Law 90-448, and acts amendatory thereof or supplementary thereto, so that the people of Minnesota may have the opportunity to indemnify themselves from future flood losses through the purchase of this insurance.

Subd. 2. Within 90 days after May 20, 1973, the commissioner shall prepare a list of local governmental units having areas subject to recurrent flooding and shall notify each local governmental unit included on this list of his findings. If a local governmental unit objects to the commissioner's findings, it shall submit evidence supporting its objections within 45 days after receiving the commissioner's notification. Thereafter the commissioner shall accept or reject the findings of each local governmental unit submitting evidence, shall prepare an amended list of local governmental units having areas subject to recurrent flooding, and shall notify each local governmental unit of its inclusion on the amended list.

Subd. 3. Within 120 days after receiving notice of inclusion on the amended list, each local governmental unit shall apply for participation in the national flood insurance program in the manner prescribed by federal laws and regulations.

INCENTIVES FOR HAZARD MITIGATION

Reducing Future Flood Damages by:

The Minnesota Proposal

In the early part of this century, the individual and local units of government were totally responsible for the consequences of building and living in the flood plain. In the 1930's, this responsibility shifted as the federal government began assuming responsibility for controlling floods through public works project. By the mid-seventies, the federal government had assumed the major financial responsibility for building structures to control floods and for providing disaster relief after a flood event. The individual, the local unit of government, and, to a great extent, the states assumed the passive role of "benefited party" of this federal language while the taxpayer at large contributed billions of dollars to the cycle of building, flooding, relief and rehabilitation, public works project, more building, more flooding, more relief and rehabilitation, more public works projects, etc. As the public costs of this cycle escalated in the 60's and 70's, the federal government began the difficult process of returning the responsibility for wise and unwise use of flood prone lands to local and state units of government. The focus of this shift back to individual, local and state responsibility is through cost-sharing.

The implication of these "new" federal policies is that state and local units of government will have to look to their own resources to develop and implement programs for reducing future flood damages. It is imperative that the states take the lead in setting up the infrastructure that will promote a state-local partnership and allow this partnership to effectively compete for any funds that may be available.

The following Draft Statute establishing a state flood hazard mitigation program is being considered in Minnesota. This program would provide state cost-sharing with local units of government that desire to implement flood damage reduction techniques. There is an emphasis on planning and integration of techniques into a comprehensive flood damage reduction program. The draft statute is presented in total so that other states can appreciate the level of administrative detail. Much of the detail could be developed through administrative rule; discretion should be exercised as to the appropriate level of detail needed in the individual state statutes.

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A bill for an act

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relating to flood plain management; establishing a state flood hazard mitigation program to mitigate the damaging effects of floods on public and private properties; authorizing a grants-in-aid and loan program for local government for flood damage mitigation; amending Minnesota Statutes 1980, Section 104.02, Subdivision 2 and 6 and adding subdivisions; amending Minnesota Statutes 1980, Chapter 104 by adding a Section; appropriating money.

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BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:

Section 1. Minnesota Statutes 1980, Section 104.02 is amended to read:

[104.02 DEFINITIONS. Subdivision 1.] For the purposes of sections [104.01 to 104.07] the terms defined in this section have the meanings given them.

Subd. 2. "Regional flood" means a flood which is representative of large floods known to have occurred generally in Minnesota and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of the 100 year recurrence interval.

Subd. 3. "Flood Plain" means the areas adjoining a watercourse which has been or hereafter may be covered by the regional flood.

Subd. 4. "Floodway" means the channel of the watercourse and those portions of the adjoining flood plains which are reasonably required to carry and discharge the regional flood. It is a regulatory area where most development and use is prohibited.

Subd. 5. "Flood fringe" means that portion of the flood plain outside of the floodway.

Subd. 6. "Local governmental unit" or "Local government" means a county, city, village, or borough or any other sub-state governing body which has legislative authority to control land uses, and levy taxes for flood management purposes.

Subd. 7. "Commissioner" means the commissioner of natural resources.

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Subd. 8. "Regional flood area" means those areas of the state that are, or would be, inundated by the regional flood.

Subd. 9. "Structural flood management measures" means physical actions taken to modify the behavior and extent of floods and flooding such as construction of dams, dikes, levees, and flood bypass channels.

Subd. 10. "Non-structural flood management measures" means those actions in flood plain areas designed to reduce the damaging effects of floods on existing and potential users of flood plains by managing the extent, degree and types of flood plain uses in a manner which affords maximum protection of human life and property without physically altering flood the behavior. Such measures may include public acquisition of flood plain lands, relocation of structures and facilities, floodproofing of essential facilities, flood warning systems, land use control ordinances, building codes, signs and notifications in regional flood areas, flood risk insurance, public education on risk and land use within flood areas and other measures designed to keep people and property away from floods and flood effects and reduce flood damage losses.

Subd. 11. "Mitigation" means the act of alleviating the effects of floods and flooding by moderating or making less the severe damages resulting from floods through structural and non-structural measures which keep floods away from people and people away from floods.

Subd. 12. "Natural floodway" means the channel of the watercourse and those portions of adjoining flood plains which are reasonably required to carry and discharge the regional flood without considerations of development which increase floodstages.

Section 2. Minnesota Statutes 1980, Chapter 104, is amended by adding a section to read:

[104.09] (Flood Hazard Mitigation Grants.)

Subdivision 1 (Purpose:) The public health, safety and welfare is promoted by establishing and maintaining a

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comprehensive program to mitigate the damaging effects of floods on existing public and private developments located in regional flood areas of the State. It is the purpose of this section to protect public and private investments, social and environmental values within regional flood areas of the State by providing for the development and implementation of the most feasible, practical, and effective methods for mitigating the adverse effects of recurrent flooding.

Subd. 2. (Purpose of Grants) From money appropriated for the following purposes, the commissioner may grant aid to local governments to:

(a) Conduct flood management studies to determine the most feasible, practical and effective methods and programs for mitigating the damages due to flooding within regional flood areas and their watersheds in rural and urban sections of the State.

(b) Implement flood proofing of public and private structures to protect property.

(c) Acquire privately owned lands and structures within regional flood areas, with priority given to acquisition within the natural floodway, and relocate publicly and privately owned structures from regional flood areas to areas not susceptible to flood hazards.

(d) Establish flood warning systems and procedures to provide for advance warning and orderly evacuation of regional flood areas subject to flooding from natural climatic occurrences or failure of man-made developments, including establishment of public sign and notification measures within flood prone areas.

(e) Develop plans and construct structural flood management measures, including dikes, levees, flood by-pass channels, and flood storage and flood retardation structures, but excluding deepening and straightening of existing stream channels.

Subd. 3. (Procedures, Commissioners Duties)

(a) The commissioner, subject to available funds,

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shall make a grant for the purposes of the studies prescribed in Subd. 2 (a) upon request of a local government on forms supplied by the commissioner, provided that all cooperating local government units are identified and the method and degree of cooperative effort by the local governments in carrying out a unified program are indicated. Studies shall include a detailed analysis of the causes and extent of flooding and flood damages, and the nature, extent and effectiveness of structural and non-structural measures presently implemented by the local governments to reduce floods.

(b) The commissioner shall not consider a request for a grant to a local government for implementations of any of the purposes in Subd. 2 (b) through (e) until the following procedures have been completed:

(1) The local government has adopted and is effectively administering a flood plain management ordinance for the regional flood area involved and the ordinance conforms to the provisions of Sec. 104.01 through 104.08 and current agency rules and is approved by the commissioner.

(2) The local government submits a report, prepared in cooperation with the commissioner, to the commissioner. The report shall contain an analysis of: the causes and extent of flooding and flood damages; the nature and extent of non-structural measures presently employed by the local government; an evaluation of feasible, practical and effective structural and non-structural methods and programs which could be implemented to mitigate the flood hazards for the regional flood area involved; and an analysis of the financial capability of the local government to carry out flood hazard mitigation measures including; details of the present financial status and taxing capabilities, possible sources of funds available to the local government for flood hazard mitigation, and a disclosure of any funds from federal programs provided to local governments and applicable to mitigation efforts.

(3) The local government submits a request for a grant, on forms supplied by the commissioner, including

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supporting facts substantiating the requirements of clauses (1) and (2).

(c) Upon receipt of a request for a grant and the required facts outlined in paragraphs (a) and (b) the commissioner shall enter into negotiations with the local government and make a determination of:

(1) The most feasible, practical and effective methods and programs for mitigating the effects of floods within the regional flood area involved.

(2) The recommended level of grant assistance which should be provided to the local government, based on available facts regarding the nature and extent of the flood problem, the impact on local people and public welfare in general, the degree and effectiveness of existing flood plain management efforts by the local governments, the financial capability of the local government, the availability and amount of federal funds which could be available for the effort, and the conditions of Subd. 4 relating to limitations.

(d) The commissioner shall establish a priority list of regional flood areas for which grants exceeding \$250,000 should be made to local governments for the purpose of Subd. 2 (b) through (e). The priorities shall be based on:

(1) The nature extent and severity of flood problems involved;

(2) The frequency of occurrence of severe flooding which has resulted in declaration of the area as a presidentially declared natural disaster area;

(3) The nature and substance of existing flood management ordinances and measures being implemented and administered by the local government;

(4) The economic, social and environmental benefits and detriments of the proposed efforts to mitigate flood hazards;

(5) The financial capabilities of the local government to address its flood hazard problems;

(6) The type and effectiveness of the proposed

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mitigation measures and the non-flood related benefits and detriments, if any, which would result if the proposed measure was implemented; and

(7) The estimated cost and method of financing of the proposed mitigation measures based on local funds, federal funding assistance and the recommended level of state funding.

(e) The priority list shall be presented by the commissioner to the governor and the legislature for funding consideration before November 1 preceding each odd numbered legislative session.

Subd. 4. (Limitations:)

(a) If the recommended level of grant assistance is less than \$100,000 the commissioner may make a grant to a local government without the approval of the executive council.

(b) If the recommended level of grant assistance exceeds \$100,000 but is less than \$250,000 the commissioner may make a grant to a local government with the approval of the executive council.

(c) If the recommended level of grant assistance to a local government exceeds \$250,000 the commissioner shall submit the recommended grant request in a prioritized listing with the priority report required in Subd. (3) (d).

(d) In determining the recommended level of a grant pursuant to Subd. 3 the maximum amount of state grant assistance shall be 50 percent of the total cost of a proposed mitigation program.

Subd. 5. (Loans) In the event that local government funding capability is insufficient to provide the non-state share of mitigation program cost, for the purpose of Subd. 2 (b) through (e), remaining after the recommended state grant amount is determined, and when there are insufficient federal funds to provide for the non-state share, the local government shall notify the commissioner in writing of the need for a loan to cover up to 90 percent of remaining cost not provided by the state grant and available federal funds. Upon receipt of notification and evidence to support the need for a

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loan the commissioner shall report the request for a loan to the next convening legislature for legislative consideration of the loan and the amount to be provided. Upon receipt of legislative approval of a loan, the commissioner shall notify the local government. The local government may then apply to the commissioner of finance on forms supplied by the commissioner of finance for the loan. The loan is repayable over a period not to exceed 20 years with interest at a rate sufficient to cover the cost to the state of borrowing the money. Each local government receiving a flood hazard mitigation loan shall for the loan payment in that year, and each year thereafter, until its loan is paid; (a) the amount of its loan payment or (b) the amount of the required loan payment less the amount the local government certifies is available from other sources for the loan payment. Upon satisfaction of the loan requirements the commissioner of finance shall make the loan in an amount and on terms that are appropriate. All principal and interest payments received by the commissioner of finance on repayment of these loans are appropriated to the state building account.

Subd. 6 (State Property in Regional Flood Areas)

(a) The commissioner, subject to availability of flood information within each county, shall submit a notification containing lists or maps showing the extent of the regional flood to each state agency which may control or have jurisdiction over lands and facilities located within regional flood areas of a county.

(b) Each state agency occupying or using lands within regional flood areas delineated by the commissioner shall prepare a inventory of all land uses, structures and facilities located in each county.

(c) Each state agency in consultation and with the assistance of the commissioner and in consultation with affected local governments shall prepare a proposed flood hazard mitigation plan which provides for the most feasible, practical and effective flood mitigation measures, for state

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property within the regional flood area, based on the inventory in paragraph (b).

(d) The inventory required in paragraph (b) shall be prepared on forms supplied by the commissioner and shall be submitted by each state agency, which occupies or uses lands within regional flood areas of a county, together with the mitigation plan required in paragraph (c) within 180 days after receipt of the notification in paragraph (a) unless the commissioner agrees to an extension of time based on justification for such extension supplied by the involved state agency.

If a state agency receiving notification does not occupy or use any lands located within the regional flood area of a county the agency shall return the forms to the commissioner stating that the agency has no occupancy or use of any lands within the regional flood area of the county involved.

(e) Upon receipt of the information required in paragraph (d) the commissioner, in cooperation with the state agency involved, shall prepare a report to the governor and legislature by November 1 of each year preceeding an odd numbered legislative session. The report shall include a recommendation of the measures which should be taken to mitigate the effects of flooding on the state property and facilities involved, including comments on consistency of the plan with any local government flood management plans and a estimate of the costs of those recommended mitigation measures requiring funding consideration by the legislature, where applicable. In the event that a state agency has extensive land occupancy and use in a given county requiring additional flood mitigation study and evaluation the commissioner shall request funds from the legislature for completion of such study and analysis before recommending implementation of any mitigation measures requiring state funding.

(f) If a state agency involved has sufficient available financial, administrative and personnel resources to

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implement recommended mitigation measures without additional funding such measures shall be implemented as soon as possible to reduce flood damages on the lands and properties involved.

Sec. 3. (Appropriations)

Subd. 1. The sums set forth in Subd. 2 through 4 are appropriated from the general fund to the commissioner of natural resources for the purposes specified in the subsequent subdivisions of this section, and shall be available until June 30, 1983.

Subd. 2. For administration of the program, pursuant to Section 104.09 the commissioner may increase the authorized personnel complement by no more than 3 positions to accomplish the program. \$200,000

Subd. 3. For the purposes of providing grants to local governments for flood management studies, pursuant to Sec. 104.09 Subd. 2 (a) \$800,000.

Subd. 4. For the purposes of providing grants to local governments for the implementation of flood hazard mitigation pursuant to Sec. 104.09 Subd. 2 (b) through (e) \$2,000,000.

Subd. 5. For loans to local governments pursuant to the following sum is appropriated to the commissioner of finance from the state building fund. \$1,500,000

Subd. 6. To provide the money appropriated from the state building fund in Subd. 5 the commissioner of finance, upon request of the governor, shall sell and issue bonds of the state in an amount up to \$1,500,000 in the manner upon the terms, and with the effect prescribed by Minnesota Statutes Chapter 16A. 63 to 16A. 67, and the Constitution, Article XI, Sections 4 to 7.

Sec. 4 (Effective Dates)

Section 1. Is effective the day following enactment. Sections 2, 3 and 4 are effective July 1, 1981.

TOTAL WATERSHED MANAGEMENT

Reducing Future Flood Damages by:

The Maryland Example

Most flood plain regulatory programs only deal with activities (or proposed activities) which are within the mapped flood plain. Activities outside the identified flood plain are usually not analyzed to determine their impact on flood stages or discharges. In certain watersheds, the impact of new development, even though it is not in the regulatory flood plain, can be substantial. For example, in quickly draining small, watersheds that are undergoing rapid urbanization, new development means more impervious surfaces (buildings, parking lots, driveways, roads) replacing earth that was able to "soak up" rain in its natural state prior to development. After development occurs, the water that used to soak in now runs off. The more extensive the development in a watershed, the more water will run off resulting in increased flood flows. Not only will the amount of water increase but also, the depth and amount of area inundated will increase. These types of changes in flooding characteristics can also occur for reasons other than urbanization, such as changing forest or pasture land to cropland and/or drainage of swamps, ponds, wetlands or other natural water storage areas.

In these types of watersheds where changes in land use will affect the characteristics of future floods, the flood plain management implication is that development built in the flood plain and elevated to a presumed "safe" elevation will, after the land use changes occur in the watershed, no longer be "safe" because more water is coming out of the watershed. Thus the person who builds in accordance with the provisions of the flood plain management regulations will, in spite of attempted compliance, likely be subjected to flood damage.

The most effective solution to this type of problem is to consider the total watershed and the impacts of future development on future flood flows. Through this process a community can prevent future flooding problems which they know will occur by guiding all future development in a comprehensive basis agreed to be the community(s). These considerations are taken into account in Maryland's flood plain management enabling act. The specific language is as follows:

Maryland Statutes § 8-9A-05

(b) The Department, in cooperation with its subdivisions and the Departments of State Planning and Agriculture, shall conduct studies of the watersheds which shall define at least (1) the existing magnitude and frequency of flood events, (2) the magnitude and frequency of flood events based on planned development, and (3) alternative management techniques according to their effectiveness in controlling floods and minimizing flood damage. These studies shall address at least the 100-year flood event.

Under this statute, the state regulates the flood plain based upon planned development runoff and flood conditions. The local community must enforce its flood management plan that was used to calculate the planned development conditions; and cost sharing (50/50) grants are available to local communities to implement the management techniques to reduce flood damage provided they comply with the approved comprehensive plan.

The Maryland statute is particularly comprehensive; thus it is presented in its entirety for the reader's information.

1r3661

Senator McQuirk (Departmental - Natural Resources)
introduced and read first time: February 18, 1980
assigned to: Economic Affairs

Committee Report: Favorable with amendments
Senate action: Adopted with floor amendments
read second time: March 26, 1980

CHAPTER

NATURAL ACT CONCERNING

Flood Control and Watershed Management

FOR the purpose of deleting sections relating to interim flood hazard areas, maps, rules and regulations; deleting definitions of "floodway" and "interim flood hazard area" and references to those terms; changing the definition of "100 year flood event" and adding the requirements necessary for the implementation of a Comprehensive Flood Management Grant program; making this Act contingent upon the enactment of another Act except in certain political subdivisions where this contingency does not apply; and providing which subdivisions are eligible to receive certain grants before the Department of Natural Resources promulgates certain rules and regulations.

BY repealing and reenacting, with amendments,

Article - Natural Resources
Section 8-9A-01 through 8-9A-11, inclusive
Annotated Code of Maryland
(1974 Volume and 1979 Supplement)

SECTION 1. BE IT ENACTED BY THE GENERAL ASSEMBLY OF MARYLAND, That section(s) of the Annotated Code of Maryland be repealed, amended, or enacted to read as follows:

Article - Natural Resources

8-9A-01.

(a) In this subtitle, the following terms have the meanings indicated.

EXPLANATION: CAPITALS INDICATE MATTER ADDED TO EXISTING LAW. [Brackets] indicate matter deleted from existing law. Underlining indicates amendments to bill. ~~Strike-out~~ indicates matter stricken by amendment.

flood hazard areas of the State; (2) considerable public costs are incurred through the emergency preparedness program, and by replacing public utilities and other public capital investments DESTROYED OR DAMAGED BY FLOODS; (3) flood waters disregard jurisdictional boundaries; and (4) the public INTEREST necessitates management of waters and flood hazard areas for the objectives of preventing and alleviating flood threats to life and health, reducing private and public economic losses, and to the extent possible, preserving the biological values associated with these land and water resources.

(b) The policy and purposes of this subtitle are to assist in the guidance of development to minimize the impacts of flooding; [to delineate interim flood hazard areas and designate allowable uses within]; to provide State guidelines and technical assistance to local governments in management of flood hazard areas; to provide for comprehensive watershed management; to facilitate implementation of projects for flood control; to encourage and provide for local governmental units to manage flood-prone lands in a comprehensive manner; [and] to provide for the biological and environmental quality of the watersheds of the State; AND TO ESTABLISH A GRANT PROGRAM TO ASSIST LOCAL JURISDICTIONS WITH IMPLEMENTATION OF THOSE CAPITAL PROJECTS INCLUDED WITHIN THE COMPREHENSIVE FLOOD MANAGEMENT PLANS WHICH ARE ADOPTED AND APPROVED IN ACCORDANCE WITH THE SUBTITLE.

[8-9A-03.

(a) By April 1, 1979, the Department shall prepare maps to show interim flood hazard areas.

(b) In preparing interim flood hazard area maps, the Department shall consider the following factors:

- (1) Soil data.
- (2) Maps of flood hazard areas prepared by the Federal Insurance Administration, the U. S. Soil Conservation Service, the U. S. Army Corps of Engineers, and the U. S. Geological Survey.
- (3) Historical information relating to prior flooding.
- (4) Identification of areas as areas of tidal or nontidal inundation.
- (5) Any other studies providing pertinent information to assist in the map preparation.

The Department shall be responsible for coordinating with the Federal Insurance Administration to assure consistency in the mapping programs of the two agencies.

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(b) "Area of nontidal inundation" means an area within the State which is subject to inundation caused predominantly by accumulated surface runoff or excess rainfall runoff, or both.

(c) "Area of tidal inundation" means an area within the State which is subject to inundation caused predominantly by tides or wind-driven waters, or both.

(d) "Department" means the Department of Natural Resources.

(e) "Federal flood insurance program" means the PROGRAM ESTABLISHED BY THE National Flood Insurance Act of 1968, as amended.

(f) "Flood hazard area" means an area of tidal or nontidal inundation resulting from a 100-year flood event and established pursuant to the provisions of § 8-9A-[05]03.

(g) "Floodway" means the minimum cross-sectional area required to convey a 100-year flood.

(h) "Interim flood hazard area" means an area of tidal or nontidal inundation resulting from a 100-year flood event and established pursuant to the provisions of § 8-9A-[03.]

(i)(G) "100-year flood event" or "100-year flood" means a flood [likely to occur on the average of once every 100 years, that is, a flood] that has a 1 percent chance of [occurring] BEING EQUALLED OR EXCEEDED in any given year. [For purposes of the interim flood management program, the basis for determining the 100-year flood event shall be the existing development of a watershed. For purposes of the management program, the basis for determining the 100-year flood event shall be the planned future development of the watershed.]

(j)(H) "Secretary" means the Secretary of Natural Resources.

(k)(I) "subdivision" means any county, including Baltimore City. The term "subdivision" also means any incorporated municipality which has the authority to adopt and enforce land use and control measures for the areas within its jurisdiction.

(a) The General Assembly finds and declares that (1) recurrent flooding of a portion of the State's land resources causes loss of life, damage to property, disruption of commerce and governmental services, and unsanitary conditions, all of which are detrimental to the health, safety, welfare, and property of the occupants of

(c) When the Department determines that an accurate map exists for an area, the Department shall file a copy of the map of the interim flood hazard area lying within any subdivision in the circuit court of the appropriate county or of Baltimore City if the area lies within Baltimore City. The Department shall publish a notice of the filing in a newspaper of general circulation in the county where the interim flood area lies. The notice shall state the location in the subdivision where the map shall be available for viewing by the public. In addition, the Department shall notify by first-class mail each owner shown on the tax records as an owner of land lying within an interim flood hazard area.

(d) The Department shall hold a hearing in each county where an interim flood hazard area lies. The Department shall publish notice of each hearing in a newspaper of general circulation within the appropriate subdivision, and where the interim flood hazard area lies. After holding a public hearing in each county where an interim flood hazard area lies, the Department shall adopt each map as a rule or regulation within six months of the date of hearing.

(e) After adopting any interim flood hazard area map, the Department may conspicuously mark in the field (1) the location of the flood hazard area; and (2) other areas the Department may deem necessary to effectuate the purposes of this subtitle.]

[8-9A-04.

(a) Within one year after adoption of a map as a regulation of the Department, the subdivision shall adopt rules and regulations for governing uses within interim flood hazard areas upon consideration of the following:

- (1) The availability of alternate locations for the use;
- (2) The permanency of the use;
- (3) The effect of the use on planned development of the area adjacent to it;
- (4) Whether the area is an area of tidal or nontidal inundation;
- (5) Good husbandry practices common to normal and efficient agricultural production;
- (6) Any other factor consistent with the purposes of this subtitle.

(b) In authorizing a use within an interim flood hazard area, the subdivision shall require that any use or

(1) When the Department determines that an accurate map exists for an area, the Department shall file a copy of the map of the interim flood hazard area lying within any subdivision in the circuit court of the appropriate county or of Baltimore City if the area lies within Baltimore City. The Department shall publish a notice of the filing in a newspaper of general circulation in the county where the interim flood area lies. The notice shall state the location in the subdivision where the map shall be available for viewing by the public. In addition, the Department shall notify by first-class mail each owner shown on the tax records as an owner of land lying within an interim flood hazard area.

(d) The Department shall hold a hearing in each county where an interim flood hazard area lies. The Department shall publish notice of each hearing in a newspaper of general circulation within the appropriate subdivision, and where the interim flood hazard area lies. After holding a public hearing in each county where an interim flood hazard area lies, the Department shall adopt each map as a rule or regulation within six months of the date of hearing.

(e) After adopting any interim flood hazard area map, the Department may conspicuously mark in the field (1) the location of the flood hazard area; and (2) other areas the Department may deem necessary to effectuate the purposes of this subtitle.]

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- (2) The permanency of the use;
- (3) The effect of the use on planned development of the area adjacent to it;
- (4) Whether the area is an area of tidal or nontidal inundation;
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(d) The Department shall hold a hearing in each county where an interim flood hazard area lies. The Department shall publish notice of each hearing in a newspaper of general circulation within the appropriate subdivision, and where the interim flood hazard area lies. After holding a public hearing in each county where an interim flood hazard area lies, the Department shall adopt each map as a rule or regulation within six months of the date of hearing.

(e) After adopting any interim flood hazard area map, the Department may conspicuously mark in the field (1) the location of the flood hazard area; and (2) other areas the Department may deem necessary to effectuate the purposes of this subtitle.]

[8-9A-04.

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the effects of any use are minimized to the most practicable extent to protect against danger to life, danger to water quality, or danger to property from:

- (1) Water which may be backed up or diverted by the use;
- (2) An obstruction swept downstream; and
- (3) Construction or alteration of an obstruction within the interim flood hazard area.

(c) A use within an interim flood hazard area may not be authorized unless the person proposing the use demonstrates to the appropriate subdivision:

- (1) That the proposed use will be provided with adequate drainage;
- (2) That support systems for the use such as water and sewerage facilities, road, and other utilities will be adequately flood proofed;

(3) That the use will not increase the surface water elevation of the 100-year flood event more than the increment of flood elevation specified by the Department; and

(4) That all permanent structures associated with the use shall be flood proofed to withstand a 100-year flood.

(d) (1) If a subdivision elects, the Department, in consultation with the subdivision, shall prepare rules and regulations governing uses within the interim flood hazard areas of the subdivision pursuant to the provisions of this section. The subdivision shall then adopt these rules and regulations.

(2) If a municipality elects, the county, in consultation with the municipality, may prepare the rules and regulations necessary under this section. If the county does not agree, the Department, in consultation with the municipality, shall prepare the rules and regulations. The municipality shall adopt the rules and regulations prepared for it.

(3) The Department shall also provide technical assistance to subdivisions in the interpretation of flood information and the drafting of local regulatory measures as required by this section.]

[8-9A-05]8-9A-03.

(a) By [January 1, 1977,] JULY 1, 1981 the Department, after consultation with \ and consideration of[,]]

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[(9)](8) Tax adjustment [policy] POLICIES;

[(10)](9) Subdivision, zoning, and related ordinances; and

[(11)](10) Other practical methods.

(e) In any interjurisdictional watershed, THOSE PORTIONS OF the flood management plans of the subdivisions [within] RELATING TO the watershed shall be subject to review and approval by the Department as one plan. ANY COMPREHENSIVE FLOOD MANAGEMENT PLAN WHICH INCLUDES A PROJECT FOR WHICH GRANT FUNDS ARE REQUESTED UNDER THIS SECTION IS SUBJECT TO REVIEW AND APPROVAL BY THE DEPARTMENT. If a plan is disapproved, the Secretary shall set forth in writing the reason for disapproval. Disapproval of a plan shall be based only on flood management considerations.

(f) The Department and the subdivisions shall coordinate activities under this section with all related programs including the national flood insurance program, the sediment control program, and the State water pollution control and abatement programs.

(g) [Every] EACH subdivision shall implement the flood management plan for [a] ITS watershed. [Implementation may include amendments of measures required under § 8-9A-04.] If a subdivision so elects, the Department, in consultation with the subdivision, shall prepare THE rules and regulations to implement the flood management plan. The subdivision shall adopt these rules and regulations. If a municipality elects, and the county agrees, the county, in consultation with the municipality, [may] SHALL prepare the rules and regulations [necessary under this section]. If the county does not agree, the Department, in consultation with the municipality, shall prepare, IF REQUESTED, the rules and regulations. The municipality shall adopt the rules and regulations prepared for it. Implementation of the flood management plans shall begin within one year after they are completed [in accordance with § 8-9A-05 (d)].

(H) THERE IS A COMPREHENSIVE FLOOD MANAGEMENT GRANT PROGRAM WITHIN THE DEPARTMENT OF NATURAL RESOURCES.

(1) SUBJECT TO THE APPROVAL OF THE BOARD OF PUBLIC WORKS THE DEPARTMENT MAY PROVIDE GRANTS TO SUBDIVISIONS FOR FLOOD CONTROL AND WATERSHED MANAGEMENT CAPITAL PROJECTS, PROVIDED THAT THE PROJECTS ARE CONSISTENT WITH THE PLANS AND IMPLEMENTATION PREPARED AND ADOPTED IN ACCORDANCE WITH THIS SUBTITLE, AND PROVIDED FURTHER THAT EACH FLOOD CONTROL AND WATERSHED MANAGEMENT CAPITAL PROJECT:

(1) IS UNDERTAKEN AS PART OF A COMPREHENSIVE FLOOD MANAGEMENT PLAN PREPARED AND ADOPTED BY THE SUBDIVISION; AND

recommendations submitted by subdivisions and the departments of State Planning and Agriculture, shall divide the State into watersheds for the purpose of flood control planning and management and establish a schedule for completion of studies of all watersheds.

(b) The Department, in cooperation with the subdivisions and the departments of State Planning and Agriculture, shall conduct studies of the watersheds which shall define at least (1) the existing magnitude and frequency of flood events, (2) THE magnitude and frequency of flood events based on planned development, and (3) alternative management techniques according to their effectiveness in controlling floods and minimizing flood damage. The studies shall address at least the 100-year flood event.

(c) As a part of the study undertaken under subsection (b), the Department shall delineate the flood hazard areas on maps showing areas of tidal and nontidal inundation. [The Department shall publish and adopt the flood hazard area maps pursuant to the same procedures of § 8-9A03 for publishing and adopting the interim flood hazard area maps. When adopted, the flood hazard area maps shall supersede the interim flood hazard area maps. Each subdivision shall adopt rules and regulations governing uses within flood hazard areas, pursuant to § 8-9A-04 of this subtitle.]

(d) Each subdivision, in cooperation with the departments of Natural Resources, State Planning, Agriculture, and other appropriate State agencies shall prepare a flood management plan based upon an evaluation of the alternative management techniques and other findings [as provided in] INCLUDED IN STUDIES CONDUCTED UNDER subsection (b). Each flood management plan shall be consistent with the purposes and provisions of this subtitle.

Management techniques may include:

- (1) Flood control dams;
- (2) Levees and dikes;
- [(3) Floodways;]
- [(4)](3) Stormwater detention or retention structures;
- [(5)](4) Flood warning systems;
- [(6)](5) Public acquisition;
- [(7)](6) Flood proofing;
- [(8)](7) Storm drain and stream maintenance;

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389 INTERJURISDICTIONAL FLOOD MANAGEMENT PLAN.

(II) IS NOT INCONSISTENT WITH ANY STATE OR

393 DEPARTMENT SHALL BE MATCHED BY A MINIMUM AMOUNT OF 50 PERCENT OF LOCAL FUNDS FOR A PROJECT. THE DEPARTMENT MAY PROVIDE UP TO 50 PERCENT OF THE NONFEDERAL SHARE OF THE FUNDING FOR A PROJECT WHICH MEETS THE CRITERIA OF THIS SUBTITLE.

(3) TO RECEIVE A GRANT, THE SUBDIVISION MUST PARTICIPATE IN THE NATIONAL FLOOD INSURANCE PROGRAM.

(4) BEFORE MAKING A GRANT, THE DEPARTMENT, IN COOPERATION WITH THE DEPARTMENT OF STATE PLANNING, SHALL REVIEW THE FLOOD CONTROL AND WATERSHED MANAGEMENT OPERATIONS OF THE APPLICANT SUBDIVISION TO ASSURE THAT THEY ARE IN COMPLIANCE WITH THIS SUBTITLE.

(5) THE DEPARTMENT, IN CONSULTATION WITH THE DEPARTMENT OF STATE PLANNING, SHALL PROMULGATE RULES AND REGULATIONS NECESSARY FOR THE ADMINISTRATION OF THE GRANT PROGRAM. THESE RULES AND REGULATIONS MAY INCLUDE:

(I) A DETERMINATION OF STATEWIDE AND INTERJURISDICTIONAL NEEDS AND PRIORITIES;

(II) STANDARDS OF ELIGIBILITY FOR APPLICANTS AND PROJECTS;

(III) CRITERIA FOR RECOGNITION OF TIDAL AND NONTIDAL AREAS;

(IV) ENGINEERING AND ECONOMIC STANDARDS AND ALTERNATIVES; AND

(V) PROCEDURES FOR FILING AND PROCESSING CONTENTS OF APPLICATIONS.

(6) EACH PROJECT APPLICATION SHALL BE SUBMITTED TO AND REVIEWED BY THE STATE CLEARINGHOUSE OF THE DEPARTMENT OF STATE PLANNING IN ACCORDANCE WITH ESTABLISHED CLEARINGHOUSE PROCEDURES.

8-9A-[06]04.

(a) The Department shall assure that State construction projects and state-assisted construction projects meet the requirements of this subtitle.

(b) The Department shall evaluate the effects of changes in the character of the watersheds. In order to assist the Department, the subdivisions shall provide the Department with information on local development, changes in land use, and other physical changes. The Department is the

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pository for all flood-related data and activities with regard to the provisions of § 8-9A-[05]03.

(c) The Department periodically shall review the maps of [interim flood hazard areas and] flood hazard areas and local activities undertaken pursuant to this subtitle to determine whether its provisions are being adhered to.

(d) The Department shall report every two years to the Governor and General Assembly on January 1 concerning the progress of the implementation of this subtitle. The report may contain [(1)] recommendations for (1) IMPROVEMENTS TO the subtitle, (2) [any] actions needed to improve implementation of the subtitle, and (3) [any] amendments to the flood hazard area maps.

8-9A-[07]05.

(a) [All] EACH [subdivisions] SUBDIVISION shall take measures to enforce the provisions of this subtitle within [their] ITS [jurisdictions] JURISDICTION, including the enactment of a local law prescribing a civil penalty IN THE FORM OF A FINE not exceeding \$500 for each day of violation of any local law it enacts to implement this subtitle. The local law shall [also] provide that each day upon which a violation occurs OR CONTINUES constitutes a separate offense. [However, the] THE LOCAL LAW SHALL PROVIDE THAT THE total civil penalty may not exceed \$10,000.

(b) If a subdivision fails to enforce any provision of this subtitle, including any ordinance or local law the subdivision enacts pursuant to it, or if the subdivision does not possess the authority to [enforce] CORRECT a violation of this subtitle, the Department may request the Attorney General to take appropriate legal action to correct the violation.

(c) [The]A court exercising equity jurisdiction in the county where the land or any part of the land or water covered by this subtitle is located may restrain any violation of this subtitle, or order the abatement of a condition resulting from any violation and order the restoration of lands and waters to the condition existing prior to the violation, in an action brought by a subdivision affected by the violation, BY the Department [or] BY any authorized unit or officer of the Department, OR BY THE ATTORNEY GENERAL.

8-9A-[08]06.

By mutual agreement, the Department [shall] MAY delegate all or part of its responsibilities under this subtitle to a subdivision if the Department determines that the subdivision has the technical and financial resources to fulfill the responsibilities to be delegated.

8-9A-[09]07.

494 The provisions of this subtitle concerning the
496 authorities of the Department and the subdivisions of the State with respect to flood hazard management are in addition to any other provision of law.

8-9A-[10]08.

505 Engineering, technical and administrative services
506 required to implement the provisions of this subtitle shall
507 be funded as provided in the State budget.

8-9A-[11]09.

509 This subtitle may be cited as the Flood Hazard
510 Management Act of 1976.

514 SECTION 2. AND BE IT FURTHER ENACTED, That the passage
515 of this Act is contingent upon the passage of H.B. 930
516 (01r2106) or S.B. 568 (01r2767) of 1980. Should that
517 measure fail of enactment, the provisions of this Act are
518 null and void without the need of further action by the
519 General Assembly, except that the provisions of this Act are
521 not null and void and shall apply, regardless of the failure
522 of enactment of H.B. 930 (01r2106) or S.B. 568 (01r2767) to
523 any subdivision which had received, prior to July 1, 1980, a
524 commitment from the Board of Public Works for funds on a
525 matching basis for a capital project or projects for flood
526 control or watershed management.

527 SECTION 3. AND BE IT FURTHER ENACTED, That, until such
528 time as the Department of Natural Resources promulgates the
529 rules and regulations and other review procedures required
530 under § 8-9A-03(H) of § 1 of this Act, any subdivision which
532 had received, prior to July 1, 1980, a commitment from the
533 Board of Public Works for funds on a matching basis for a
534 capital project or projects for flood control or watershed
535 management shall be deemed eligible to receive grants during
536 fiscal year 1981 for flood control or watershed management
537 capital projects from the Board of Public Works as
538 authorized pursuant to the provisions of any bond
539 authorization act adopted for this purpose. Any
540 subdivision, in submitting an application for grant funds
541 pursuant to the foregoing, shall certify to the Board of
542 Public Works that any project for which grant funds are
543 being requested is part of a flood management plan prepared
544 and adopted by the subdivision, and that the subdivision is
545 participating in the national flood insurance program.

SECTION 4. AND BE IT FURTHER ENACTED, That this Act shall take effect July 1, 1980.

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SPECIFIC COASTAL STANDARDS

Reducing Future Flood Damages by:

Ocean Hazard Area standards (North Carolina)
Creating the Coastal Council and Standards (Rhode Island)
Control of state actions or barrier beaches (Massachusetts)
Control of state expenditures in coastal areas (Florida)

When attention is given to "reducing future flood damages", the traditional dialogue has dealt primarily with riverine flood plains. The riverine flooding situation is fairly well understood and predictable. Water levels rise, banks are overtopped and increased flow velocities are responsible for any erosion, but, the 100-year flood plain boundary remains fairly static over time. River and creek channels may meander and change course quite often but there is less variability in change of the 100-year flood plain boundary. In contrast, coastal flooding along oceanfront areas is not confined to static limits over time. Because of rising sea levels, shore erosion and submergence of land, the coastal 100-year flood plain boundary is moving landward. The flooding process is more dynamic because variable wind directions and speeds, astronomical and meteorological tide variations and nearshore bathymetry affect wave heights and current speeds. A mere rise in still water level is not the case for coastal floods.

The cost of construction and value of property comprise an economical difference between inland and coastal areas. Low-cost housing construction and flood proofing are used to avoid flood damages associated with rising water levels in inland areas. Coastal construction, however, must be able to withstand the high forces of winds, currents, waves and tidal surges. The cost of such construction can be high. Property values also differ greatly between these two areas. Insurance premiums per structure in the coastal zone average twice that in inland areas. The desire for vacation, retirement and "second home" building along the coast has contributed to the increased value in property. The economical ramification of this inequity between construction costs and property value in the two areas becomes a public problem when disaster assistance is needed. Unless some changes are made and realistic policies adopted relating to construction standards, avoidance of high hazard areas and prescribing land uses compatible with the risks, enormous public expenditures and potential loss of life are inevitable.

The coastal states have employed a variety of methods to address the hazards of coastal development. The section of the North Carolina Administrative Code dealing with Ocean Hazard Areas is reproduced to illustrate a detailed approach. The legislation creating the Rhode Island Coastal Resources Management Council is also reproduced. The Executive Order No. 181 of Governor King of Massachusetts is presented to illustrate a restrictive approach taken after a serious storm event while the Florida Executive Order, issued by Governor Graham, is presented to illustrate the directing of state funds out of coastal hazard areas.

NR&CD - COASTAL MANAGEMENT

T15: 07H .0300

History Note: Statutory Authority G.S. 113A-107 (a); 674
 113A-107 (b); 113A-113 (b) (6a); 675
 113A-113 (b) (6b); 113A-113 (b) (6d); 676
 Eff. September 9, 1977. 677

.0303 MANAGEMENT OBJECTIVE OF OCEAN HAZARD AREAS 679

(a) The CRC recognizes that absolute safety from the 681
 destructive forces indigenous to the Atlantic shoreline is an 682
 impossibility for development located adjacent to the coast. The
 loss of life and property to these forces, however, can be 683
 greatly reduced by the proper location and design of shoreline 684
 structures and by care taken in prevention of damage to natural
 protective features particularly primary and frontal dunes. 685
 Therefore, it is the CRC's objective to provide management 686
 policies and standards for ocean hazard areas that serve to 687
 eliminate unreasonable danger to life and property and achieve a
 balance between the financial, safety, and social factors that
 are involved in hazard area development. 688

(b) The purpose of these Regulations shall be to further the 689
 goals set out in G.S. 113A-102 (b), with particular attention to 690
 minimizing losses to life and property resulting from storms and 691
 long-term erosion, preventing encroachment of permanent 692
 structures on public beach areas, and reducing the public costs 693
 of inappropriately sited development.

History Note: Statutory Authority G.S. 113A-107 (a); 696
 113A-107 (b); 113A-113 (b) (6a); 697
 113A-113 (b) (6b); 113A-113 (b) (6d); 698
 Eff. September 9, 1977; 699
 Amended Eff. February 2, 1981. 700

.0304 AECs WITHIN OCEAN HAZARD AREAS 702

The ocean hazard system of AECs contains all of the following 704
 areas: 705

(1) Ocean Erodible Area. This is the area in which there 706
 exists a substantial possibility of excessive erosion and 707
 significant shoreline fluctuation. The seaward boundary
 of this area is the mean low water line. The landward 708
 extent of this area is determined as follows:

(a) a distance landward from the first line of stable 709
 natural vegetation to the recession line that would be 710
 established by multiplying the long-term annual erosion 711
 rate, as most recently determined by the Coastal 712
 Resources Commission, times 30, provided that where
 there has been no long-term erosion or the rate is less 713
 than two feet per year, this distance shall be set at

NR&CD - COASTAL MANAGEMENT

T15: 07H .0300

60 feet landward from the first line of stable natural 714
 vegetation; and
 (b) a distance landward from the recession line established 715
 in Subparagraph (a) of this Paragraph to the recession 716
 line that would be generated by a storm having a one 717
 percent chance of being equalled or exceeded in any
 given year.

(2) The High Hazard Flood Area. This is the area subject to 719
 high velocity waters (including, but not limited to, 720
 hurricane wave wash) in a storm having a one percent
 chance of being equalled or exceeded in any given year, as 721
 identified as zone V1-30 on the flood insurance rate maps
 of the Federal Insurance Administration, U.S. Department 722
 of Housing and Urban Development. In the absence of these 723
 rate maps, other available base flood elevation data
 prepared by a federal, state, or other source may be used, 724
 provided said data source is approved by the CRC.

(3) Inlet Hazard Area. The inlet hazard areas are those lands 725
 identified by the State Geologist to have a substantial 726
 possibility of excessive erosion that are located adjacent 727
 to inlets. This area shall extend landward from the mean
 low water line a distance sufficient to encompass that 728
 area within which the inlet will, based on statistical
 analysis, migrate, and shall consider such factors as 729
 previous inlet territory, structurally weak areas near the 730
 inlet (such as an unusually narrow barrier island, an
 unusually long channel feeding the inlet, or an overwash 731
 area), and external influences such as jetties and
 channelization. These areas are identified as recommended 732
 inlet hazard areas in the report to the CRC entitled 733
 "Inlet Hazard Area" by Lois J. Priddy and Rick Carraway
 (September 1978). In all cases, this area shall be an 734
 extension of the adjacent ocean erodible area and in no 735
 case shall the width of the inlet hazard area be less than
 the width of the adjacent ocean erodible area. 736

History Note: Statutory Authority G.S. 113A-107 (a); 739
 113A-107 (b); 113A-113 (b) (6); 740
 Eff. September 9, 1977; 741
 Amended Eff. August 6, 1979; July 15, 1979. 742

.0305 GENERAL IDENTIFICATION AND DESCRIPTION OF LANDFORMS 744

(a) Ocean Beaches. Ocean beaches are lands consisting of 746
 unconsolidated soil materials that extend from the mean low water 747
 line landward to a point where either: (1) the growth of
 vegetation occurs, or (2) a distinct change in slope or elevation 748

.0306 GENERAL USE STANDARDS FOR OCEAN HAZARD AREAS 785

(a) In order to protect life and property, all development not 787
 otherwise specifically exempted or allowed by law or elsewhere in 788
 these Regulations shall be located according to whichever of the
 following rules is applicable.

(1) If neither a primary nor frontal dune exists in the AEC 789
 on or behind the lot on which the development is 791
 proposed, the development shall be landward of the 792
 erosion setback line. The erosion setback line shall 793
 be set at a distance of 30 times the long-term annual 794
 erosion rate from the first line of stable natural 795
 vegetation. In areas where the rate is less than 2
 feet per year, the setback line shall be 60 feet from
 the vegetation line.

(2) If a primary dune exists in the AEC on or behind the 796
 lot on which the development is proposed, the 797
 development shall be landward of the crest of the 798
 primary dune or the long-term erosion setback line, 799
 whichever is farthest from the first line of stable
 natural vegetation. For existing lots, however, where
 setting the development behind the crest of the primary
 dune would preclude any practical use of the lot, 800
 development may be located seaward of the primary dune.
 In such cases, the development shall be located behind 801
 the long-term erosion setback line, and shall not be
 located on or in front of a frontal dune. The words 802
 "existing lots" in this Rule shall mean a lot or tract
 of land which, as of June 1, 1979, is specifically 803
 described in a recorded plat and which cannot be
 enlarged by combining the lot or tract of land with a 804
 contiguous lot(s) or tract(s) of land under the same
 ownership.

(3) If no primary dune exists, but a frontal dune does 805
 exist in the AEC on or behind the lot on which the 806
 development proposed, the development shall be set
 behind the frontal dune or behind the long-term erosion 807
 setback line, whichever is farthest from the first line
 of stable natural vegetation. 808

(b) In order to avoid weakening the protective nature of ocean 810
 beaches and primary and frontal dunes, no development will be 811
 permitted that involves the significant removal or relocation of 812
 primary or frontal dune sand or vegetation thereon. If possible, 813
 other dunes within the ocean hazard area shall not be disturbed
 only to the extent allowed by Rule .0308 (b). 814

(c) In order to avoid excessive public expenditures for 815
 maintaining public safety, construction or placement of growth- 816

inducing public facilities to be supported by public funds will 817
 be permitted in the ocean hazard area only when such facilities:
 (1) clearly exhibit overriding factors of national or state 818
 interest and public benefit, 819
 (2) will not increase existing hazards or damage natural 820
 buffers, 821
 (3) will be reasonably safe from flood and erosion related 822
 damage, 823
 (4) will not promote growth and development in ocean hazard 824
 areas. 825

Such facilities include, but are not limited to, sewers, 827
 waterlines, roads, bridges, and erosion control structures. 828

(d) Development shall not cause major or irreversible damage 829
 to valuable documented historic architectural or archaeological 830
 resources.

(e) Development shall be consistent with minimum lot size and 831
 set back requirements established by local regulations. 832

(f) Mobile homes shall not be placed within the high hazard 833
 flood area unless they are within mobile home parks existing as 834
 of June 1, 1979.

(g) Development shall be consistent with the general 835
 management objective for ocean hazard areas set forth in Rule 836
 .0303 of this Section.

(h) Development shall not create undue interference with legal 837
 access to, or use of, public resources. 838

(i) Development proposals shall incorporate all reasonable 839
 means and methods to avoid or minimize adverse impacts of the 840
 project. These measures shall be implemented at the applicant's 841
 expense and may include actions that will:

(1) minimize or avoid adverse impacts by limiting the 842
 magnitude or degree of the action, 843
 (2) restore the affected environment, or 844
 (3) compensate for the adverse impacts by replacing or 846
 providing substitute resources. 847

(j) Prior to the issuance of any permit for development in the 849
 ocean hazard AECs, there shall be a written acknowledgement from 850
 the applicant that the applicant is aware of the risks associated 851
 with development in this hazardous area and the limited
 suitability of this area for permanent structures. By granting 852
 permits, the Coastal Resources Commission does not guarantee the 853
 safety of the development and assumes no liability for future 854
 damage to the development.

(k) All relocation of structures requires permit approval. 855
 Structures relocated with public funds shall comply with the 856
 applicable setback line as well as other applicable AEC
 regulations. Structures relocated entirely with non-public funds 857
 shall be relocated the maximum feasible distance landward of the 858

present location. In these cases, all other applicable local and state regulations shall be met.

History Note: Statutory Authority G.S. 113A-107; 859
113A-113 (b) (6); 862
Eff. September 9, 1977; 863
Amended Eff. February 2, 1981; 864
November 13, 1980; June 1, 1980; 865
September 15, 1979. 866
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.0307 USE STANDARDS FOR OCEAN HAZARD AREAS; EXCEPTIONS 869

History Note: Statutory Authority G.S. 113A-107 (a); 871
113A-107 (b); 113A-113 (b) (6) a; 872
113A-113 (b) (6) b; 113A-113 (b) (6) d; 873
Eff. September 9, 1977; 874
Amended Eff. January 24, 1978; 875
Repealed Eff. September 15, 1979. 876

.0308 SPECIFIC USE STANDARDS 878

(a) Ocean Shoreline Erosion Control Activities 879

- (1) Shoreline erosion projects shall not be constructed in 881
beach or estuarine areas that sustain substantial 882
habitat for important wildlife species unless adequate 883
mitigation measures are incorporated into project
design, as set forth in Rule .0306 (i) of this Section. 884
- (2) Project construction shall be timed to have minimum 885
significant adverse effect on biological activity. 886
- (3) Property owners may, in emergency situations, obtain 887
AEC permits to protect existing structures along the 888
ocean front by means of bulkheads, seawalls, or similar 889
structures if it is determined that the structure is 890
threatened. A threatened structure is one that was 891
built prior to June 1, 1979, and where the apparent 892
erosion rate is such that the structure's foundation is 893
imminently endangered. Normally, the structure's 894
foundation will be considered endangered if the 895
foundation is less than 20 feet away from the toe of 896
the dune or erosion scarp. 897
- (4) All structural erosion control projects shall 898
demonstrate sound engineering for ocean shoreline 899
erosion control projects. 900
- (5) Preferred erosion control measures to combat ocean 901
front erosion shall be beach nourishment projects or 902
relocation when these are found to be the most 903
effective control measures for a given site. 904
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Comprehensive shoreline management shall be preferred 899
over small scale methods.

- (6) Notice of proposed erosion control projects shall be 900
given to adjacent property owners and no permit shall 901
be issued until the adjacent owners have signed the 902
notice form or until a reasonable effort has been made 903
to serve notice on the adjacent property owners by 904
registered or certified mail.
 - (7) Shoreline erosion control structures (excluding beach 905
nourishment and berm projects) shall only be allowed 906
when their purpose is to protect development that was 907
existing as of June 1, 1979.
 - (8) Beach bulldozing (defined as the process of moving 908
natural beach material from any point seaward of the 909
first line of stable vegetation to create a protective 910
sand dike or to obtain material for any other purpose) 911
is development. Beach bulldozing is allowed under the 912
emergency maintenance and repair provisions of 15 NCAC 913
7K and may also be permitted if the following 914
limitations are met:
 - (A) The area on which this activity is being performed 915
must maintain a slope of adequate grade so as to 916
not endanger the public or the public's use of the 917
beach and should follow the pre-emergency slope as 918
closely as possible. The movement of material 919
utilizing a bulldozer, front end loader, backhoe, 920
scraper, or any type of earth moving or 921
construction equipment should not exceed one (1) 922
foot in depth measured from the pre-activity 923
surface elevation; 924
 - (B) The activity must not exceed the lateral bounds of 925
the applicant's property unless he has permission 926
of adjoining owners; 927
 - (C) Movement of material from seaward of the low water 928
line will not be permitted as emergency 929
maintenance or repairs; 930
 - (D) The activity must not significantly increase 931
erosion on neighboring properties and must not 932
have a significant adverse effect on important 933
natural or cultural resources; 934
 - (E) The activity may be undertaken to protect 935
threatened on-site waste disposal systems as well 936
as the threatened structure's foundations. 937
- (b) Dune Establishment and Stabilization. Activities to 938
establish dunes shall be allowed so long as the following 939
conditions are met: 940

- (1) Any new dunes established shall be aligned to the greatest extent possible with existing adjacent dune ridges and shall be of the same general configuration as adjacent natural dunes.
- (2) Existing primary and frontal dunes shall not, except for beach nourishment and emergency situations, be broadened or extended in an oceanward direction.
- (3) Adding to dunes shall be accomplished in such a manner that the damage to existing vegetation is minimized. The filled areas will be immediately replanted or temporarily stabilized until planting can be successfully completed.
- (4) Sand used to establish or strengthen dunes must be brought in from a source outside the ocean hazard area and must be of the same nature as the sand in the area in which it is to be placed.
- (5) No new dunes shall be created in inlet hazard areas.
- (6) That sand held in storage in any dune other than frontal or primary dunes may be moved laterally in order to strengthen existing primary or frontal dunes if the work would enhance the protection to the proposed development activity.
- (7) No disturbance of a dune area will be allowed when other techniques of construction can be utilized and alternative site locations exist to avoid unnecessary dune impacts.
- (c) Structural Accessways
- (1) Structural accessways shall be permitted across primary dunes so long as they are designed and constructed in a manner which entails negligible alteration on the primary dune. Structural accessways may not be considered threatened structures for the purpose of Paragraph (a) of this Rule.
- (2) An accessway shall be conclusively presumed to entail negligible alteration of a primary dune if:
- (A) The accessway is exclusively for pedestrian use;
- (B) The accessway is less than six feet in width; and
- (C) The accessway is raised on posts or pilings of five feet or less depth, so that wherever possible only the posts or pilings touch the frontal dune. Where this is deemed impossible, the structure shall touch the dune only to the extent absolutely necessary. In no case shall an accessway be permitted if it will diminish the dune's capacity as a protective barrier against flooding and erosion; and

- (D) Any areas of vegetation that are disturbed are revegetated as soon as feasible.
- (3) An accessway which does not meet (2) (A) and (B) of this Paragraph shall be permitted only if it meets a public purpose or need which cannot otherwise be met and it meets (2) (C) of this Paragraph. Public fishing piers shall not be deemed to be prohibited by this Rule, provided all other applicable standards are met.
- (d) Construction Standards. New construction and substantial improvements (increases of 50 percent or more in value on square footage) to existing construction shall comply with the following standards:
- (1) In order to avoid unreasonable danger to life and property, all development shall be designed and placed so as to minimize damage due to fluctuations in ground elevation and wave action in a 100 year storm. Any building constructed within the ocean hazard area shall comply with Appendix D, "Windstorm Resistive Construction," of the North Carolina Residential Building Code, except that when any provisions of that appendix are inconsistent with any of the following AEC standards, the more restrictive provisions shall control.
- (2) All structures in the ocean hazard area shall be on pilings not less than eight inches in diameter if round or eight inches to a side if square.
- (3) All pilings shall have a tip penetration greater than eight feet below the lowest ground elevation under the structure. For those structures so located on the primary dune or nearer to the ocean, the pilings must extend to four feet below mean sea level.
- (4) All foundations shall be adequately designed to be stable during applicable fluctuations in ground elevation and wave forces during a 100 year storm. Cantilevered decks and walkways shall meet this standard or shall be designed to break-away without structural damage to the main structure.
- (5) All pilings shall be appropriately treated to resist decay, insects and corrosion.
- (6) The lowest portion of the structural member of the lowest floor (excluding the pilings or columns) shall be elevated to or above the 100 year storm elevation.
- (7) All exposed structural connections shall be adequately rustproofed or enclosed.
- (8) All utility systems shall be located and constructed so as to minimize or eliminate storm damage.

- (9) All walls below 100 year base flood level shall be designed and installed to: (A) allow storm waters to rise and flow freely under the structure, (B) not permit the breakaway walls themselves to become water-borne debris, and (C) not cause the accumulation of water-borne debris. Break-away walls shall be intended to collapse under stress without jeopardizing the structural support of the structure. 1006-1010
- (10) No impermeable (such as asphalt or cement) surfaces shall be allowed over any functional part of a complete septic tank system. 1011-1012

History Note: Statutory Authority G.S. 113A-107; 1015
 113A-113(b) (6); 1016
 Eff. June 1, 1979; 1017
 Amended Eff. February 2, 1981; April 22, 1980; 1018
 March 1, 1980. 1019

.0309 USE STANDARDS FOR OCEAN HAZARD AREAS: EXEMPTIONS 1021

- (a) The following types of development may be permitted seaward of the oceanfront setback requirements of Rule .0306(a) of the Subchapter if all other provisions of this Subchapter and other state and local regulations are met: 1023-1024
 - (1) campgrounds that do not involve substantial permanent structures; 1027-1028
 - (2) parking areas with clay, packed sand or similar surfaces; 1029-1030
 - (3) outdoor tennis courts; 1032
 - (4) elevated decks not exceeding 500 square feet; 1033
 - (5) beach accessways consistent with Rule .0308(c) of this Subchapter; 1035-1036
 - (6) unenclosed, uninhabitable gazebos with floor areas of 200 square feet or less; 1037-1038
 - (7) uninhabitable storage sheds with floor areas of 200 square feet or less; and 1039-1040
 - (8) temporary amusement stands. 1042

In all cases, this development shall only be permitted if it is landward of the vegetation line, involves no significant alteration or removal of primary or frontal dunes or the dune vegetation, has overwalks to protect any existing dunes and meets all other non-setback requirements of this Subchapter. 1044-1047

(b) Where strict application of the oceanfront setback requirements of Rule .0306(a) of this Subchapter would preclude placement of permanent structures on lots existing as of June 1, 1979, such development may be permitted seaward of the applicable setback line in ocean erodible areas, but not inlet hazard areas, if each of the following conditions is met: 1049-1052

- (1) The development is set back from the ocean the maximum feasible distance possible on the existing lot and the development is designed to minimize encroachment into the setback area; 1054-1055
- (2) The development is at least 60 feet landward of the vegetation line; 1056-1057
- (3) The development is not located on or in front of a frontal dune, but is entirely behind the landward toe of the frontal dune; 1058-1059
- (4) The development incorporates each of the following design standards, which are in addition to those required by Rule .0308(d) of this Subchapter. 1060-1061
 - (A) All pilings have a tip penetration that extends to at least four feet below mean sea level; 1063-1064
 - (B) The lowest habitable floor of the structure be no more than 1,000 square feet or 10 per cent of the lot size, whichever is greater. In calculating by size for the purposes of applying this Rule, the vegetation line shall be used as the seaward reference point. 1065-1067
- (5) All other provisions of this Subchapter and other state and local regulations are met. If the development is to be serviced by an on-site waste disposal system, a copy of a valid permit for such a system must be submitted as part of the CAMA permit application. 1069-1071

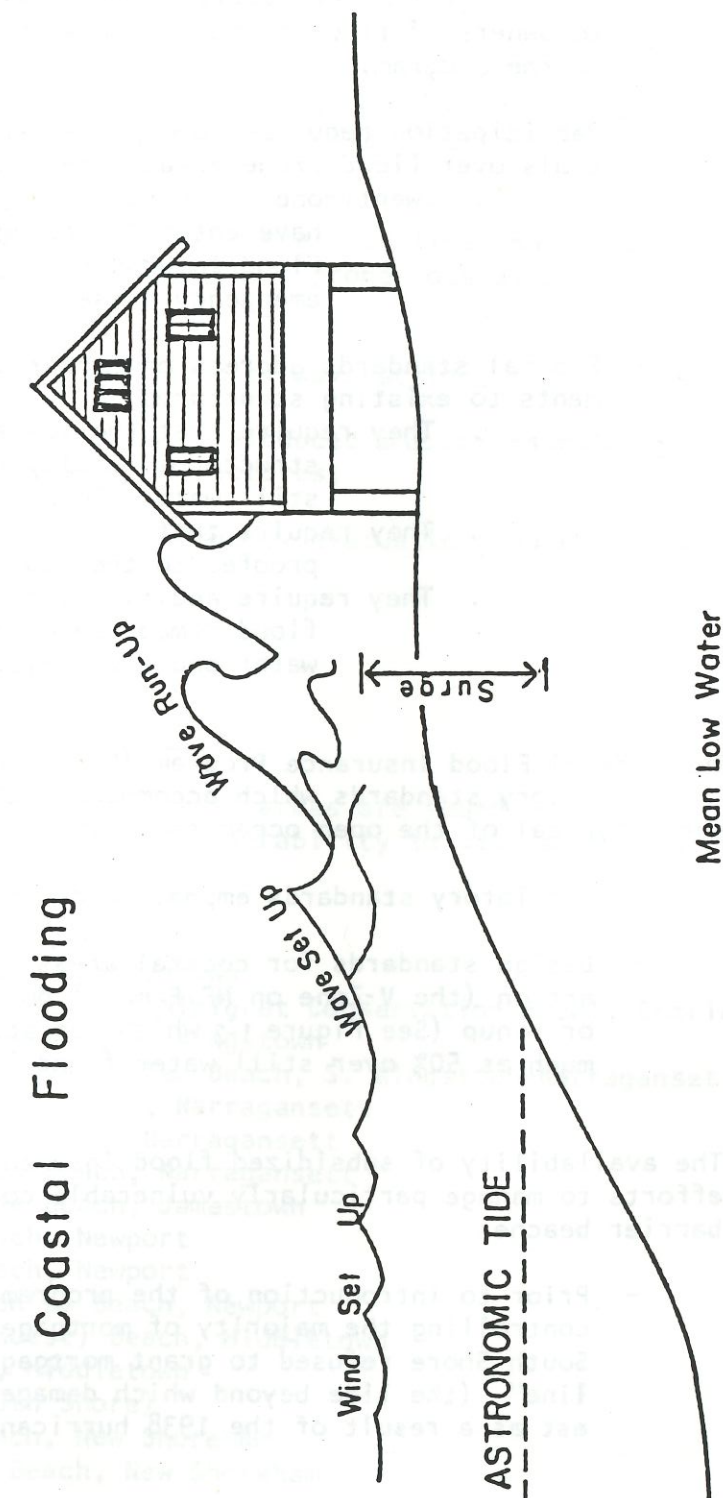
For the purposes of this Rule, an existing lot is a lot or tract of land which, as of June 1, 1979, is specifically described in a recorded plat and which cannot be enlarged by combining the lot or tract of land with a contiguous lot(s) or tract(s) of land under the same ownership. 1073-1075

History Note: Statutory Authority G.S. 113A-107 (a); 1078
 113A-107 (b); 113A-113 (b) (6) a; 1079
 113A-113 (b) (6) b; 113A-113 (b) (6) d; 1080
 Eff. February 2, 1981; 1081
 Amended Eff. June 9, 1981. 1082

130.0-1 FINDINGS:

- A. Much of the state's shoreline is vulnerable to flooding during severe winter storms and hurricanes.
- In the past 350 years Rhode Island has been struck by 71 hurricanes, 13 of which caused severe flooding and 25 moderate floodings.
 - Two major hurricanes in the last 40 years caused extensive damage and loss of life; 311 dead, \$125 million in damages and 1,966 homes destroyed in 1938; 15 dead, \$200 million in damages and 3,800 homes destroyed in 1954.
 - The entire South Shore and portions of the Narragansett Bay shoreline have been designated coastal high hazard areas by the Dept of Housing & Urban Development. These areas are subject to wind driven waves and surge (abnormally high water level) during coastal storms (Figure 1-2)
- B. Considerable progress has been made in minimizing the state's vulnerability to coastal storm damage and flooding.
- Improved weather forecasting provides a minimum 12 hours notice of approaching storms.
 - Community evacuation plans have been formulated and police have been authorized to enforce them during emergencies.
 - Emergency exit routes from isolated coastal areas have in many instances been built or improved.
 - Over \$17 million has been spent on coastal flood protection in the last twenty years. Projects include construction of hurricane barriers, breakwaters, beach and dune stabilization.
- C. In the last ten years the federal government has become increasingly involved in flood damage prevention, first through the National Flood Insurance act of 1968 and then through the Flood Disaster Act of 1973.

Figure 1-2



- The objective of the Federal Flood Insurance Program is to guide development away from flood prone areas.
- This program makes federally subsidized flood insurance available to owners of flood prone property in communities participating in the program.
- Participation requires communities to implement regulatory controls over flood prone areas based on minimum federal standards.
 - . Twenty-one of the state's 37 flood prone communities have entered the regular phase of the National Flood Insurance Program, while 16 remain in the emergency phase.
- Federal standards address new construction or substantial improvements to existing structures.
 - . They require that the lowest floor of residential structures be elevated to above the 100 year still water flood level.
 - . They require that non-residential structures be flood proofed to the 100 year level.
 - . They require additional design features to minimize flood damage to or movement of structures and water and sewer systems.

D. The Federal Flood Insurance Program (NFIP) has had difficulty in establishing regulatory standards which accommodate the severe wave action and storm surge typical of the open ocean shoreline.

- Regulatory standards emphasize design rather than location.
- Design standards for coastal areas subject to high velocity wave action (the V-Zone on NFIP maps) do not account for wave height or runup (See Figure 1-2 which can account for an increase of as much as 50% over still water flood levels).

E. The availability of subsidized flood insurance has complicated state efforts to manage particularly vulnerable coastal areas such as low lying barrier beaches.

- Prior to introduction of the program in Rhode Island banks controlling the majority of mortgage business along the state's South Shore refused to grant mortgages seaward of the "wet wash line" (the line beyond which damage and destruction was heaviest as a result of the 1938 hurricane).

- The absence of ready financing severely limited development pressure in high flood hazard areas which has risen enormously since introduction of the program.
- The problem seems to be that subsidized actuarial rates do not reflect the real risk of building in coastal high hazard areas consequently provide an artificial stimulus to such building.

F. The Council finds a particular threat to lives and property as a result of development of low lying and flood prone coastal areas where the following conditions exist:

- Exposure to high velocity wave action, runup and surge;
- Vulnerability to storm-induced erosion, especially where such erosion threatens structures;
- Vulnerability of emergency evacuation routes to flooding or erosion.

130.0-2 POLICIES AND REGULATIONS:

A. The following developed coastal areas are found to be particularly hazardous because of their vulnerability to wave action, erosion and flooding:

Atlantic Beach, Westerly
 Central Beach, Charlestown
 East Beach, (west of Ninigret Conservation Area), Charlestown
 Charlestown Beach, S. Kingstown
 East Matunuck-Jerusalem Beach, S. Kingstown-Narragansett
 Sand Hill Cove Beach, Narragansett
 Narragansett Beach, Narragansett
 Bonnet Shores Beach, Narragansett
 Mackerel Cove Beach, Jamestown
 Hazard's Beach, Newport
 Bailey's Beach, Newport
 First (Easton's) Beach, Newport
 Second (Sachuest) Beach, Middletown
 Third Beach, Middletown
 Tunipus (South Shore)
 Crescent Beach, New Shoreham
 Coast Guard Beach, New Shoreham

Construction* within these developed flood hazard areas shall require a Council permit and shall be subject to the following rules and regulations:

1. Construction, restoration and/or substantial improvement of structures on the beach face or dunes shall be prohibited.
 2. The lowest structural member of the lowest floor of any new, restored or substantially improved structure shall be elevated a minimum of 6 feet above the 100 year flood level as determined by the Dept. of Housing and Urban Development. Said member or members shall be adequately anchored to pilings with the space between the pilings free of obstructions.
- B. The following essentially undeveloped coastal areas are also of concern to the Council because of their vulnerability to wave action erosion and flooding:
- (1) Napatree Beach, Westerly
 - (2) Maschaug Beach, Westerly
 - (3) Quonochontaug Beach, Westerly-Charlestown
 - (4) East Beach (Ninigret Conservation Area to breachway) Charlestown
 - (5) Moonstone Beach, S. Kingstown
 - (6) Browning Beach, S. Kingstown
 - (7) Watchhouse Pond Beach, Little Compton
 - (8) Long Pond Beach, Little Compton
 - (9) Round Pond Beach, Little Compton
 - (10) Briggs Beach, Little Compton
 - (11) Ship Pond Cove, Little Compton
 - (12) Round Meadow Pond Beach, Little Compton
 - (13) Quicksand Beach, Little Compton
 - (14) Sandy Point, New Shoreham
 - (15) West Beach, New Shoreham

Construction within these undeveloped flood hazard areas shall require a Council permit and shall be reviewed as set forth under Section 140. See also Section 120.

* For the purposes of these policies construction is defined as including new construction; restoration of structures reduced to 50% or less of market value by fire, flood or other such catastrophe; and substantial improvements such as additions or other structural modifications to existing structures.

COMMONWEALTH OF MASSACHUSETTS

By His Excellency

EDWARD J. KING
Governor

EXECUTIVE ORDER NO. 181

BARRIER BEACHES

Preamble

A barrier beach is a narrow low-lying strip of land generally consisting of coastal beaches and coastal dunes extending roughly parallel to the trend of the coast. It is separated from the mainland by a narrow body of fresh brackish or saline water or marsh system. It is a fragile buffer that protects landward areas from coastal storm damage and flooding.

The strength of the barrier beach system lies in its dynamic character; its ability to respond to storms by changing to a more stable form. Frequently man induced changes to barrier beaches have decreased the ability of landform to provide storm damage prevention and flood control. Inappropriate development on barrier beaches has resulted in the loss of lives and great economic losses to residents and to local, state and federal governments. The taxpayer, who often cannot gain access to barrier beach areas, must subsidize disaster relief and flood insurance for these high hazard areas.

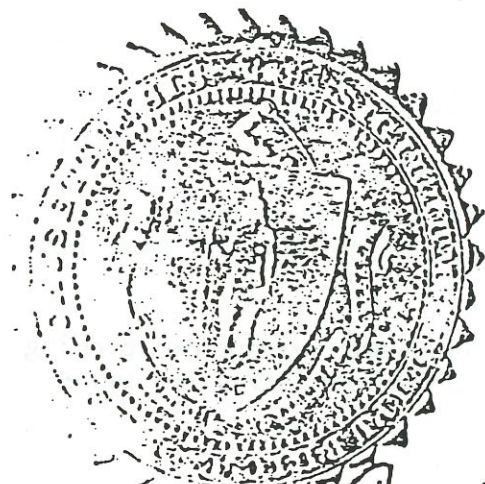
Since barrier beaches are presently migrating landward in response to rising sea level, future storm damage to development located on the barriers is inevitable.

WHEREAS, the Commonwealth seeks to mitigate future storm damage to its barrier beach areas;

NOW, THEREFORE, I, Edward J. King, Governor of the Commonwealth of Massachusetts, by virtue of the authority vested in me by the Constitution and laws of the Commonwealth, do hereby order and direct all relevant state agencies to adopt the following policies:

1. Barrier beaches shall be given priority status for self-help and other state and federal acquisition programs and this priority status shall be incorporated into the Statewide Outdoor Comprehensive Recreation Plan. The highest priority for disaster assistance funds shall go towards relocating willing sellers from storm damaged barrier beach areas.
2. State funds and federal grants for construction projects shall not be used to encourage growth and development in hazard prone barrier beach areas.

3. For state-owned barrier beach property, management plans shall be prepared which are consistent with state wetland policy and shall be submitted to the Secretary of Environmental Affairs for public review under the provisions of the Massachusetts Environmental Policy Act.
4. At a minimum, no development shall be permitted in the velocity zones or primary dune areas of barrier beaches identified by the Department of Environmental Quality Engineering.
5. Coastal engineering structures shall only be used on barrier beaches to maintain navigation channels at inlets and then only if mechanisms are employed to ensure that downdrift beaches are adequately supplied with sediment.
6. Dredge material of a compatible grain size shall be used for barrier beach nourishment, if economically feasible.
7. The Coastal Zone Management Office shall coordinate state agency management policy for barrier beach areas.



Given at the Executive Chamber in Boston
 this 8th day of August, in the
 year of Our Lord one thousand nine hundred
 and eighty and of the independence of
 America, two-hundred and five.

Edward J. King
 EDWARD J. KING
 GOVERNOR
 Commonwealth of Massachusetts

Michael Joseph Conolly
 Secretary of the Commonwealth

GOD SAVE THE COMMONWEALTH OF MASSACHUSETTS

State of Florida RECEIVED

OFFICE OF THE GOVERNOR SEP 4 1 20 PM '81

DEPARTMENT OF STATE
 TALLAHASSEE, FLORIDA

EXECUTIVE ORDER NUMBER 81-105

WHEREAS, it is the policy of the State of Florida to protect and manage Florida's extensive, fragile coastal resources, in order to enhance the recreational, scientific, economic and natural resource values, for both present and future Floridians; and

WHEREAS, coastal barriers, which include barrier islands, beaches, and related lands, are essential to the maintenance of these coastal resources; and

WHEREAS, these coastal barriers serve to reduce Florida's extensive vulnerability to natural hazards, particularly hurricanes, thereby reducing the ever-present threat to human life, private and public property, and other resources in the coastal areas; and

WHEREAS, these coastal barriers are vulnerable to hurricanes, other storm damage and geologic composition, and are continuously altered by wave, tidal, and wind actions; and

WHEREAS, these coastal barriers are a source of beauty and enjoyment, in addition to contributing billions of dollars to the State's economy annually; and

WHEREAS, past utilization of coastal barriers often has not taken place in a manner consistent with public safety and economic welfare; and

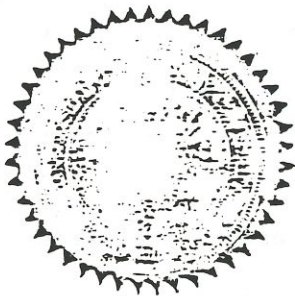
WHEREAS, certain State actions, programs, and funding policies have historically subsidized and encouraged development on coastal barriers resulting in a loss of barrier resources, increased vulnerability of human life, health, and property and the recurring obligation of tax dollars; and

WHEREAS, the Florida Legislature, the Governor, the Cabinet, and various state agencies have recognized the importance of protecting these critical coastal areas and sought to manage these resources in a manner consistent with the principles of public safety, economic development, and resources management;

NOW, THEREFORE, I, BOB GRAHAM, as Governor and Chief Executive of the State of Florida, by virtue of the authority vested in me by the Constitution and the Laws of the State, do hereby issue the following order effective immediately:

The Secretaries of the Departments of Commerce, Environmental Regulation, Health and Rehabilitative Services, Transportation, Veteran and Community Affairs and the Director of the Governor's Office of Planning and Budgeting are directed to take the following actions as applicable to their agencies:

1. Give coastal barriers, which include barrier islands, beaches and related lands, high consideration in existing state land acquisition programs and priority in the development of future acquisition programs.
2. Direct state funds and federal grants for coastal barrier projects only in those coastal areas which can accommodate growth, where there is need and desire for economic development, or where potential danger to human life and property from natural hazards is minimal. Such funds shall not be used to subsidize growth or post disaster redevelopment in hazardous coastal barrier areas. Specific consideration shall be given to the impacts of proposed development or redevelopment with respect to hazard mitigation.
3. Encourage, in cooperation with local governments, appropriate growth management so that population and property in coastal barrier areas are consistent with evacuation capabilities and hazard mitigation standards.



IN TESTIMONY WHEREOF, I have hereunto set my hand and caused the Great Seal of the State of Florida to be affixed at Tallahassee, the Capitol, this 4th day of September 1981.


GOVERNOR

ATTEST:


SECRETARY OF STATE

MANAGING URBAN RUNOFF

Reducing Future Flood Damages by:

County Planning (Pennsylvania)
Special districts (Colorado)

The process of urbanization has long been recognized as a contributor to flooding problems. The increase of impervious cover by roads, buildings, sidewalks, driveways, etc., increase the amount of water that runs off. This increased amount of runoff will contribute to flood damage by either increasing the areal extent and/or depth of water of the riverine flood plain or by sheet flow and/or ponding in a localized area. Traditional federal flood plain mapping has not considered the effects of urbanization. Several state flood damage reduction statutes mention "stormwater management" but specific standards are usually not developed. Since urbanization is tied closely with the policies and land use powers of local units of government, there are trends to encourage or mandate stormwater management at the local level. The Pennsylvania statute has been chosen to represent a county planning approach while the Colorado example, based upon authorities of the Denver Urban Drainage and Flood Control District, represents the approach targeted to the metropolitan area.

Pennsylvania 58:16A-55.4 (New Section)

Any county governing body may prepare a stormwater control and drainage plan for the county. Such plans shall be prepared after consultation and discussion with the Department of Environmental Protection and with adjacent counties and shall consider and evaluate the impact of any developments within the county or upstream from the county on the streams within the county and downstream from the county. Such plans may be financed in part from the "Emergency Flood Control Bond Act" (P.L. 1978, c.78). County stormwater control and drainage plans prepared as herein provided shall be utilized by the department in deciding to approve or disapprove any application submitted pursuant to this act.

Colorado Statute § 32-11-102(f)

The necessity for this article results from the large population growth in the urban area included by this article within the district constituting a major portion of the state's population from the numerous capital improvements and large amount of improved real property situated within such urban area from the torrential storms occurring sporadically and intermittently in the urban area and other areas draining into such urban area, from the increasing danger of floods therein and the resultant risks to the property and to the health and safety of the persons within the urban area, from the division of the urban area into large areas of incorporated areas and unincorporated areas, from the fragmentation and proliferation of powers, rights, privileges, and duties pertaining to water, flood control, and drainage within such urban areas among a substantial number of public bodies, and from the resultant inability of such public bodies to acquire suitable capital improvements for the alleviation of such dangers and risks.