FLOODPLAIN MANAGEMENT 1995

State and Local Programs

A Report by
The Association of State Floodplain Managers, Inc.

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FOREWORD

The Association of State Floodplain Managers is pleased to present *Floodplain Management 1995: State and Local Programs*. This report updates and supplements previous reports issued in 1989 and 1992, and is the most complete national summary of the practice of floodplain management at the state and local levels. We hope the material contained in this report will be a useful reference for those in the floodplain management community interested in comparing state, and some local programs, throughout the United States. Be seeing what others are doing, we can make improvements in all our programs.

Experience across the nation supports the Association's position that the most effective floodplain management is found where there is a vital local floodplain management program. These strong local programs are most often located in states that have taken a pro-active stance in promoting and/or assisting in the regulation of floodplain activities. Those states, furthermore, are usually leaders in providing technical assistance to local governmental units in planning for growth and guiding locational decisions. This support forms the nucleus for a strong and effective federal-state-local partnership.

A number of disturbing trends have emerged in the three years since this report was last published. State floodplain management programs are facing challenges in budget, organization, and authority that may threaten their ability to be full, active partners with the federal government and local communities in reducing flood losses. This is particularly alarming in the face of what has seemed to be a quantum leap in the number of flood disasters in the nation over the past three years.

This erosion of state capability appears to be the result of one or a combination of the following initiatives:

- Legislative dilution—Property rights advocates and other special interest groups have been getting proposals introduced in some state legislatures that would relax or eliminate state regulations designed to reduce flood losses. These sorts of regulations, by necessity, restrict locational decisions or development standards.

- Budgetary restrictions—Some state floodplain management programs are being constrained or reduced in effectiveness by the loss of funding. The net effect is the loss of the ability to enforce regulations and/or assist local governments.

- Organizational dissection—State agencies with regulatory functions are being reorganized or, in some cases, eliminated. This action scatters regulatory authority, technical personnel, and funding among several agencies. The result, again, is loss of capability to ensure sound land use decisions and an inability to help local governments reduce flood risks.

The impetus for these changes probably lies in the desire to reduce the size of government, cut back on the cost of government operations, or reduce government regulation that citizens believe impinges on their right to use land to their own best advantage.

Left unchecked, this trend of failing to address hazards will mortgage our children's economic well being by guaranteeing the escalation of future disaster costs. The next triennial report will reveal whether this trend has continued or abated.

The Association believes that we must mitigate against future losses from flood hazards. Mitigation is generally defined as any action taken to *permanently* reduce the threat to life and structures from hazard. Floodplain managers are focused on mitigation, have a long successful history of making mitigation work, and stand ready to play a key role in national efforts to institutionalize the mitigation ethic at all levels of government and in all development decisions.

George R. Hosek
Chair
Association of State Floodplain Managers, Inc.

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This report was written and produced by Jacquelyn L. Monday under a contract with the Association of State Floodplain Managers. Larry Larson acted as Project Manager for the Association. Diane Watson coordinated administrative details and supervised the printing and distribution. The data-gathering effort was enhanced by funding contributions from the Insurances Services Organization. This report builds upon a foundation laid in the 1989 report, most of which was written by French Wetmore, Larry Larson, and Leslie A. Bond.

Chapter 1

INTRODUCTION

It takes a cooperative effort by federal, state, and local governments and the private sector to reduce current flood damage in the United States, to prevent future damage, and to protect the natural resources of the nation's floodplain lands. To confront these tasks, the Unified National Program for Floodplain Management—a framework set out by the federal government—identifies four strategies for altering the relationship between humans and the hazards posed by flooding:

- modify human susceptibility to flood damage and disruption,
- modify the impact of flooding on individuals and the community,
- modify flooding, and
- restore and preserve the natural resources and functions of floodplains.

Each of these strategies can be implemented by the application of one or more of numerous activities (called "tools" in the Unified National Program). In the decade and a half since details of the Unified National Program were first formalized, a tremendous amount of work at all levels of government has been devoted to carrying out its vision. This report is one of a series that periodically documents the capability of state and local floodplain management programs; this edition covers activities undertaken during calendar years 1992, 1993, and 1994.

Most of the information presented in this report was obtained through a questionnaire mailed to the National Flood Insurance Program Coordinator in each of the 50 states, the District of Columbia, Guam, Puerto Rico, and the Virgin Islands. The first part of the questionnaire consisted of 10 pages of queries about many aspects of state and local floodplain management, including activities in furtherance of each of the tools and strategies in the Unified National Program, budget and staffing levels, coordination techniques, and assessments of the status and future trends in floodplain management each state's jurisdiction. The second part requested updated information about more than 100 state and local activities, for comparison with data presented in two preceding reports, *Floodplain Management 1992: State and Local Programs* and *Floodplain Management 1989: State and Local Programs*, and with that presented in an even earlier document, *Strengthening State Floodplain Management* (Kusler 1982:Appendix I). The third and final part of the survey called for a narrative description of the state's floodplain management program for the period 1992–1994.

The response rate to the questionnaire was 81%: the total number of respondents was 44.[1] Supplemental information was obtained from various federal, state, local, and private sources, and other published material.

The report begins with a discussion of the roles played by the state and local levels of government, then describes some broad activities they undertake. The middle part of the report is organized around the Unified National Program's framework of strategies and tools.[2] The last chapter summarizes the changes in the field over the last three years (or more, when earlier comparable data are available) and notes both statewide and national trends.

Division of Responsibility in Floodplain Management

Although each level of government is called on to do its share in a nationwide effort to reduce flood losses and protect floodplain resources, some levels are better suited to certain activities. Regulating development can best be done by local governments, following the standards and procedures of state enabling authority. Flood insurance is best handled at the federal level because of the need for a large policy base and because of the infrequency of disasters in any one city or state. A coordination and liaison role falls naturally upon state-level agencies.

Past analyses of the practice of floodplain management in the United States have illustrated that governments, organizations, and individuals often work to utilize whatever measures are necessary and feasible in a given situation to reduce flood losses or preserve resources, whether or not it is regarded as their "proper" role or responsibility (see, for example, Association of State Floodplain Managers 1989; Burby and French 1985; L.R. Johnston Associates 1992; and Platt 1987). Thus, what is handled by states in one part of the country is handled by localities in another; functions that are separate in one state are intertwined in another; federal criteria sometimes are the maxima achieved and at other times are only stepping stones to more exacting standards.

About State Floodplain Management

State governments derive their authority to plan and implement floodplain management actions from the police power vested in them by the U.S. Constitution. The principal roles played by states in floodplain management today include planning and implementing programs and projects for managing their own floodplains, including state-level regulations;

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[1] No response was received from Kansas, Nevada, New Mexico, North Carolina, Oregon, West Virginia, the District of Columbia, Guam, Puerto Rico, or the Virgin Islands. Any information contained here about their activities came either from their responses to earlier surveys or from outside sources.

[2] The strategies and tools of the Unified National Program for Floodplain Management are described in detail in Federal Emergency Management Agency and Interagency Task Force on Floodplain Management (1986), and updated in Federal Interagency Floodplain Management Task Force (1994).

providing technical expertise of all kinds to individuals and to other levels of government, especially localities; coordinating local, state, regional, and federal programs within their jurisdictions; coordinating the National Flood Insurance Program (NFIP) activities within their jurisdictions; entering into agreements with other states to cope with multijurisdictional flood problems; and acting as liaisons with the federal government. Sometimes states compensate for the inability or unwillingness of local governments to take steps to reduce their flood risk or preserve the natural functions of their floodplains. This can be done through direct state regulation of some aspects of land use, of selected types of lands, and of certain kinds of activities. The many activities and programs that contribute to floodplain management—emergency preparedness and response, natural resources protection, environmental quality, structural control measures, planning, economic development, etc.—along with the wide variety in local and regional efforts, makes the floodplain management picture of each state unique.[3]

Changes to State Statutes

Over the past three years, several states made changes to the basic legislation that authorizes floodplain management activities of one kind or another. Some of these changes strengthened the state's position with regard to managing its floodplains effectively; some of them weakened it.

Property Rights Washington passed a property rights law that could significantly hinder the ability of localities and the state to impose zoning restrictions. A new North Dakota takings law requires state agencies to assess in advance the possible impacts of their activities on private property. This law was intended to protect the interests of farmer owners of wetlands, but it affects all state agencies.

Floodplain Management Regulations In Indiana, restrictions on floodway rebuilding have been loosened, and new utility exemptions in the floodway have been created. Nebraska repealed its interim state permitting authority for designated watercourses. New York's authority to regulate floodplains in nonparticipating localities was rescinded. In Florida, the governor vetoed legislation that did not support the substantial damage provision. Maryland passed a Growth Management and Resource Protection Act, which requires localities to provide additional protection to identified sensitive areas, including streams and buffers, 100-year floodplains, habitat of threatened and endangered species, and steep slopes. Its impact has been minimal for floodplain management, however, because most Maryland communities already had ordinances that provided strong protection for floodplain areas.

Disclosure Laws During the past three years, four states (Arizona, Georgia, Illinois, and Oklahoma) passed laws designed to provide prospective owners or occupiers of floodprone property with information about its propensity to flood. Arizona and Oklahoma both passed legislation requiring that the floodprone character of parcels for sale be disclosed to prospective buyers. Arizona's law, for example, requires that all "adverse impacts" to

[3] See Federal Emergency Management Agency and Interagency Task Force on Floodplain Management (1986) and L.R. Johnston Associates (1992) for more about the role of state government in floodplain management.

property be reported, including flood insurance requirements. Georgia passed a law requiring property owners to notify prospective tenants in writing of the property's propensity to flood, if flood damage occurred to the living space of the property at least three times during the five-year period preceding the lease.

The Structure of State Programs

Most states have floodplain management "programs" that are a composite of varied activities undertaken by different agencies and other entities within the state. The central office is usually the one that coordinates the National Flood Insurance Program for that state. In 32 states or territories that function is housed in a department for natural resources, water resources, or environmental protection; in eight states it lies with an emergency preparedness agency; in six with a department of community affairs; in four with a state planning office; and in one state with a transportation department.

The overall distribution of floodplain management programs among different state agencies has changed only slightly since 1992, but there have been numerous shifts within that framework. State-level floodplain management programs, like all government efforts, sometimes find themselves buffeted by winds over which they have little control. Budget cuts—particularly in this era of "downsizing" throughout both public and private sectors—reductions in staff, and reorganization of the agency or department in which the program is housed can all have an impact on the state "program." These impacts can be positive or negative, and sometimes there is little effect at all. Often damage done to a program is not intentional, but simply the byproduct of misguided or uninformed decisions at upper levels. The following changes in the organization and/or components of state programs were noted over the last three years.

- Alaska dismantled its Division of Water, which had been part of the Department of Natural Resources.

- Illinois established a new department of natural resources, which may strengthen the state's resource protection activities, including those that affect floodplain management (which has been based in the state department of transportation).

- Maryland discontinued its planning assistance program, suspending the capital grants that were offered under it and reassigning the staff. Additional internal reorganization has diffused the floodplain management functions somewhat.

- In Michigan, a reorganization split a once-integrated department of natural resources into a more traditional fish, game, and parks department and another agency to handle regulatory programs. The implications for floodplain management are not yet clear.

- In Missouri, the floodplain management program was transferred from the natural resources department to the agency for emergency services.

- New York discontinued its program for providing flood warning assistance to communities.

- Tennessee's State Planning Office was abolished.

- In Virginia, the floodplain management and dam safety programs suffered as a result of agency reorganization and budget cuts. The state program had been a broad, integrated one, combining NFIP coordination, dam safety, community assistance, state mitigation, and working with federal agencies.

- Washington's Department of Ecology was reorganized, resulting in the dismantling of the discrete state floodplain management program. Efforts to coordinate the NFIP are continuing so far.

- Wisconsin's floodplain management program has been adversely impacted by agency reorganization. The floodplain management program was scheduled to be split from the dam safety program, but as this report went to press they were back together (though still affected by the ongoing shuffle). These two programs were integrated 10 years ago, and have become a national model of how the safety and hazard class of a dam can be tied to the floodplain management below the dam, including the dam failure zone. The state also discontinued its program for the removal of abandoned dams.

Budgets and Staffing

Table 1 shows the levels of support for floodplain management in each state. The first column shows the full-time equivalent of floodplain management personnel in each state's program today. The rest of the table shows floodplain management funding. It should be noted that the budget figures are not necessarily comparable from one state to another. The amount noted may cover only a portion of state floodplain management activities, in most cases the regulatory and technical assistance functions, and not include many other floodplain-related projects and programs. For example, budgets for structural control measures are separate from floodplain management in many states, as are funds for flood disaster preparedness and relief, acquisition, and floodplain resource protection, even though they all help alleviate flood-related problems.

Besides operating budgets, state floodplain management programs receive other kinds of state support. These include vehicles for field work and travel; supplies, office equipment, and other overhead; clerical support; legal, engineering, hydrological, planning, GIS, and other technical support; special-purpose grants; and facilities and staff for field offices.

Over the past three years, some states made changes in the way they fund all or parts of their floodplain management efforts.

- Arizona established a Water Protection Fund, the purpose of which is to provide grants to public or private entities for measures to protect water quality or quantity in order to "maintain, enhance, and restore rivers and streams and associated riparian habitat."

1. Staffs and Budgets of State Floodplain Management Programs

	Floodplain Mngmnt. Staff	Floodplain Management Budget			
	No. of FTEs	State Funds	FEMA Funds	Other Funds	Total Budget
ALABAMA	3	$ 22,557	$ 67,670		$ 90,227
ALASKA	1	30,000	50,000		80,000
ARIZONA	3.5	50,000	83,000	$50,000[b]	183,000
ARKANSAS	3	32,000	96,000		128,000
CALIFORNIA	9	691,000	240,000		931,000
COLORADO	3	200,000	78,838		278,838
CONNECTICUT	5	141,000	136,000		277,000
DELAWARE	2.4	17,000	50,000	9,200[c]	76,200
D OF COLUMBIA	—	–	—		—
FLORIDA	6	–	—		—
GEORGIA	2	27,000	80,000		107,000
GUAM		—	—		—
HAWAII	0.5	0	60,000		60,000
IDAHO	1.2	21,790	65,369		87,159
ILLINOIS	16	725,000	130,000		855,000
INDIANA	48	2,298,080	90,139	300,000[d]	2,688,219
IOWA	5.25	320,000	0		320,000
KANSAS	—	—	—		—
KENTUCKY	25	1,100,000	85,000		1,185,000
LOUISIANA	4	—	—		—
MAINE	2.5	39,000	117,000		156,000
MARYLAND	16	875,000	67,000		942,000
MASSCHUSETTS	3	50,000	150,000		200,000
MICHIGAN	16	618,200	150,000	316,200[e]	1,084,400
MINNESOTA	7.5	405,400	86,000		491,400
MISSISSIPPI	1	—	—		—
MISSOURI	1	32,000	79,000		111,000
MONTANA	1.25	5,000	57,000		62,000
NEBRASKA	2.5	109,400	0		109,400
NEVADA	—	—	—		—
N HAMPSHIRE	2	20,000	60,000		80,000
NEW JERSEY	5	14,000,000	121,000		14,121,000
NEW MEXICO	—	—	—		—
NEW YORK	6	278,700	185,700		464,400
N CAROLINA	—	—	—		—
NORTH DAKOTA	2.5	52,000	68,000		120,000
OHIO	8	155,000	150,000		305,000
OKLAHOMA	1	28,000	110,000	~15,000[f]	153,000
OREGON	—	—	—		—
PENNSYLVANIA	—	0	55,000		55,000
PUERTO RICO	—	—	—		—
RHODE ISLAND	0.5	6,600	19,800		26,400
S CAROLINA	3.25	—	—		—
SOUTH DAKOTA	0.25	0	0		0
TENNESSEE	—	15,000	50,000		65,000
TEXAS	3	50,000	150,000		200,000
UTAH	1	0	65,000		65,000
VERMONT	1	20,000	60,000		80,000
VIRGIN ISLANDS	—	—	—		—
VIRGINIA	3	60,000	100,000	30,000[f]	190,000
WASHINGTON	6	2,100,000[a]	100,000		2,200,000
WEST VIRGINIA	—	—	—		—
WISCONSIN	14	700,000	108,000		808,000
WYOMING	0.25	0	0		0

[a] includes local grants for flood damage reduction
[b] flood control planning
[c] General Fund and Bond Bill
[d] flood control projects mapping
[e] transportation funding
[f] miscellaneous sources, grants, etc.
— = data not available

- Michigan legislation set up a new fee schedule with a revolving fund that provides replacement resources for state floodplain management staff.
- The Arizona legislature appropriated funds for the establishment of a statewide flood warning system.
- Virginia modified its Flood Prevention Fund to allow its use for state-and-local projects without federal partners.
- An amendment to the Colorado Constitution imposed taxation and spending restrictions that are affecting all state agencies to some extent.

About Local Floodplain Management

Local government is the foundation of comprehensive floodplain management because localities usually determine and supervise the use of land within their jurisdictions (under the authority of the police power delegated by the state) and because the impetus for obtaining financial and technical assistance from the state and federal levels originates with the local community. A willingness and ability to take steps to manage floodplains are not automatic on the part of local governments, however. Localities are limited by their legal authority, by financial considerations, by the amount of technical expertise available to them, and by the fact that flooding and natural resource depletion must take their places among numerous other local concerns.

Local floodplain management programs vary according to the size of the community; the policy, political structure, and economic status of the state in which it is located; the type of flooding it faces; and the amount of development pressure existing in the community as a whole and in its floodprone areas. Typical small communities have no program *per se*, but only one official, usually a building inspector, who monitors and enforces compliance with the local flood hazard reduction ordinance along with other unrelated duties. In general, the larger the community, the more sophisticated and comprehensive the floodplain management-related technical expertise available to it, including planning, engineering, additional inspection and enforcement capabilities, emergency management, maintenance, parks and recreation support, water treatment facilities, and the like.

In addition to the community officials and staff, there is a range of sub-state entities that also contribute to floodplain management. These vary from state to state, but can include regional water districts, flood control districts, levee boards, watershed conservancy districts, planning commissions, natural resources districts, river authorities, county conservation districts, councils of government, stormwater management authorities, and others. Floodplain management personnel from these entities and from the localities themselves account for an estimated 13,000 to 14,000 people working on flood-related issues at the sub-state level throughout the country.

Factors affecting State and Local Floodplain Management

Each of the states and territories surveyed for this report was asked to identify any external factors that had influenced floodplain management within that state over the past three years. The two factors mentioned most often (by nine states each) were budgetary concerns and flooding. Eight states noted that the move toward downsizing in government and budget cuts had detracted from their programs. One state noted that its legislature had made changes in state budget that resulted in increased and more reliable funding for floodplain management. Two states attributed a waning of interest in floodplain management within their states to the absence of serious floods in the past three years. On the other hand, seven states said they have had more favorable responses to flood reduction efforts lately because of recent damaging floods.

Other factors mentioned by several states included the Federal Emergency Management Agency (FEMA) and the NFIP Reform Act (P.L. 103-325). FEMA's new emphasis on mitigation and on enforcement and the CRS were viewed as positive influences. The preoccupation of some regional offices with flood disasters was seen as negative by non-flooded states, as was the lack of mapping funds and the changes in the Community Assistance Program (CAP) that necessitated "reinventing" proposals and re-negotiating work plans. Several states mentioned an increased awareness of flood hazard on the part of mortgage lenders, and attributed it directly to the stronger penalties for failure to enforce the mandatory purchase requirement.

Midwest Floods of 1993

In several states, the 1993 Midwest floods generated a great deal of response, recovery, and mitigation activity, including drainage, relocation, and levee projects that are still going on today. The regional and national policy reviews that grew out of the floods have affected and involved the states as well. Minnesota, for example, reported that it has been involved in the White House Interagency Floodplain Management Review Committee's work (the Galloway report), the U.S. Army Corps of Engineers assessment on the upper Mississippi River, and the development of the National Mitigation Strategy. The result of this involvement for Minnesota has been a stronger working relationship with federal agencies, which in turn benefits floodplain management throughout the state.

Seventeen states (not all in the Midwest) said that the Midwest floods had had the positive effect of raising awareness of flooding issues, at least to some extent, both on the part of the general public and state and local officials. A few states specifically mentioned enhanced awareness of mortgage lenders. Three states saw a positive impact from the floods in FEMA's response to them: increased emphasis on and funding for mitigation. One state, however, thought that this shift in FEMA priorities took money away from needed mapping and remapping.

Mitigation

Over the past three years mitigation has become a principal focus of FEMA and other agency programs, and this emphasis has naturally affected state and local floodplain

management. A deeper understanding of the difference between short-term "fixes" and longer-term measures has grown out of this new awareness of mitigation as a concept, and this has furthered floodplain management goals at all levels. In the six or seven years since the Stafford Act established the requirement for hazard mitigation plans, interagency hazard mitigation teams have become increasingly effective and state and local plans have become much more common. The availability of post-disaster hazard mitigation funding under that act has also made a difference. And, of course, the large number of disaster declarations made during the 1993-1994 flooding resulted in the extensive use of that funding mechanism. There is also noticeable enthusiasm for FEMA's new mitigation grant program for localities.

Environmental Protection

The well-documented growth in public support for environmental protection has been a boon to floodplain management. The relationships among floods, the natural environment, and human development are no longer merely matters for scientists alone to ponder. The public increasingly is demanding environmental amenities, and floodplain management measures are now being coupled with important environmental concerns (e.g., water quality and habitat) to develop broader plans and programs for resource protection and enhancement. Again, the widespread media attention given to the Mississippi River floods of 1993 has furthered this positive development.

Conservative Mood and Budget Consciousness

A conservative political trend over the past few years has manifested itself in efforts to cut budgets at all levels and to make government smaller and less intrusive. Budgets for state floodplain management are lower now than they were three years ago (see details in Chapter VII). Many of the nation's legislators seem concerned with relieving regulatory restrictions on property owners and businesses, although there have been only a few instances to date of success in actually reducing state regulatory authority as it pertains to floodplains. The next three years will show more clearly what effect this trend is having. It is troubling, however, that a huge share of the cost of having a less-restrictive regulatory environment within a given state (i.e., a damaging flood) is reimbursed to the state by the federal government. This situation enables developers and other influential interests to argue for reducing strong state programs to the minimum national standard. They also claim unfair loss of profit on development, hardship on property owners, "taking" of private property, or that they will never request assistance that will be borne by taxpayers. These arguments hold more sway in a conservative environment.

Chapter II

STATE AND LOCAL FLOODPLAIN MANAGEMENT ACTIVITIES

The typical "state floodplain management program" is made up of many different components. Each state tailors its own program to its own needs, strengths, economic situation, etc., and each program adapts over time as conditions within the state (and outside it) change. Most state programs consist of a combination of the following activities:

- Providing technical assistance on floodplains and flooding
- Monitoring local floodplain management programs
- Adopting and enforcing state standards
- Training and educating the public and local and other officials
- Mapping and conducting related activities
- Reviewing state permits
- Assisting localities with local ordinance enforcement
- Coordinating with other government and private entities
- Flood control planning
- Supporting the National Flood Insurance program (NFIP) (including the Community Rating System)
- Furthering professional development.

State personnel surveyed for this report were asked to estimate the proportion of staff time spent on some of the activities on this list. Their responses indicate that, on the average, about 31% of state staff time is devoted to providing technical assistance; 25% to monitoring local programs; 14% for training and education of all types; and less than 10% each for state permit review, enforcing state standards, assisting localities with enforcement, mapping, and other activities.

This section describes more fully (1) the monitoring and enforcement undertaken at the state and local levels, (2) coordination of planning, (3) mapping done by the various states, (4) activities that are specifically designed to support the NFIP, and (5) professional development efforts.

Monitoring and Enforcement

The principal focus of most state-level floodplain management programs is the continuous monitoring of the performance of the localities in that state in implementing floodplain management at the local level. Table 2 shows the role taken by each state with regard to its local programs and the techniques it uses to monitor them. Virtually all states have some procedure for monitoring local programs; in most this procedure is analogous to that set up under the NFIP for verifying community implementation—the so-called community assistance contacts (CACs) and community assistance visits (CAVs). States are evenly divided on the issue of whether they consider their contact with communities to be primarily a means by which state expertise is shared in order to benefit the locality (providing "technical assistance") or whether it is primarily a means by which the state can identify deficiencies in the community's performance in administering and enforcing its ordinance ("monitoring") (see the first column of Table 2). In practice, both functions aren often served simultaneously.

As shown in the second column of the table, almost a third of the states have monitoring programs that are either independent of or more extensive than the NFIP CAVs. Site visits may be supplemented by phone contacts; annual reports; CRS verification visits; or routine reviews of planning documents, permit summaries, or other documents that give indications of local development activities. Some states use mail surveys through which localities respond to inquiries about permitting and other key issues. Some states—like Wisconsin—conduct site visits similar to CAVs, but more exhaustive, including monitoring of state requirements and standards as well as the NFIP ones. Kentucky's Division of Water has 10 regional offices throughout the state and its staff thus is able to monitor almost continuously by virtue of day-to-day contact with the localities.

Most states have set a monitoring schedule to ensure that each community's program is checked periodically. The fourth column in Table 2 shows the frequency with which a given community will be monitored in each state. It varies from every six months in Hawaii and Arizona to every eight years for certain New York localities. Instead of a rotating schedule, a few states set up their monitoring program in response to indications of a need for technical assistance and overview—growth rates, turnover of permit or building officials, number of complaints, and the like.

When monitoring reveals one or more apparent deficiencies in a locality's management of its floodplain areas, the state's role can be a minimal one or it can be the driving force in resolving the compliance problem. The fifth column in Table 2 shows the basic stance taken by each of the states with regard to the responsibility for enforcement of local floodplain management ordinances and standards. The largest proportion—15 states—believes that both the final authority and responsibility for local enforcement lie with the localities themselves. Eleven states see enforcement as a cooperative effort among the locality, the state, and FEMA. Nine states see a more limited state role—they consider enforcement to be a responsibility shared between the locality and FEMA. Two states take the position that the state and the locality share the responsibility, and two states believe enforcement of local ordinances is FEMA's responsibility alone. One state (Iowa, which has statutory authority for direct state regulation) takes final responsibility for local compliance upon itself.

Finally, the last column in the table shows the techniques states would use in the face of apparent lack of enforcement of local ordinance provisions. Lack of enforcement can range from a simple misunderstanding all the way to willful disregard of ordinance provisions. This is borne out by the fact that most states use more than one technique, depending on the

2. State Programs for Monitoring/Enforcement of Local Floodplain Management

	Purpose of Site Visits[1]	Monitoring Local Programs			Enforcement	
		Beyond CAV?	Methods[2]	Schedule	State's Position[3]	State's Techniques[4]
ALABAMA	T	no	V	5 yrs		T,rF
ALASKA	T	yes	V		c	W
ARIZONA	T	yes	V,P	6 months	a	W,L
ARKANSAS	T	no	V,P,U	3 yrs	c	T,rF,W
CALIFORNIA	T+M	yes	V,P,C	3-5 yrs	f	T,rF,I
COLORADO	T	no	V,P	1-3 yrs	c	N
CONNECTICUT	T+M	no	V,P,U,A,R	5 yrs	a	rF
DELAWARE	T+M	no	V	2-3 yrs	c	T,rF
DIST OF COLUMBIA						
FLORIDA	M	no	V	5 yrs	f	T
GEORGIA	M	no	V,P	4-5 yrs	a	T
GUAM						
HAWAII	T	no	V	6 months	a	W
IDAHO	T	no	V,P	2-3 yrs	c	T,rF
ILLINOIS	M	no		5 yrs	f	T,W
INDIANA	M				f	T
IOWA	M	yes	S		d	L
KANSAS						
KENTUCKY	T	yes	V	3-4 yrs	f	T,L,rF
LOUISIANA						
MAINE	T	no	P	5 yrs	a	T,rF
MARYLAND	T+M	yes	V	2-3 yrs	f	T,W,rF
MASSACHUSETTS	T	no	V,P	3 yrs	f	T,rF
MICHIGAN	T+M	yes	V,S	varies	f	N
MINNESOTA	M	no	V,R	5 yrs	b	L
MISSISSIPPI	—	yes	V,A,R	varies	f	
MISSOURI	T+M	yes	V,P,U,A,R	varies		
MONTANA	M	yes	V,P	1-2 yrs	b	T
NEBRASKA		yes	V,P	varies	c	I,N
NEVADA						
NEW HAMPSHIRE	T	no			a	T
NEW JERSEY	M	no	V	4-5 yrs	c	T,rF
NEW MEXICO						
NEW YORK	M	no	V,P	3 or 8 yrs	a	T,rF
NORTH CAROLINA						
NORTH DAKOTA	T	no	V,P		e	rF
OHIO	T	yes	V,P,U,R	5 yrs	a	T,W,I,L
OKLAHOMA	T+M	yes	V,P,S	2 yrs		
OREGON						
PENNSYLVANIA	M	no	V,A	varies	a	T
PUERTO RICO						
RHODE ISLAND	M	no	V	1-3 yrs	a	W
SOUTH CAROLINA	T	no			a	T
SOUTH DAKOTA	—	no	S		e	I,rF
TENNESSEE	M	yes	V	3 yrs	a	T
TEXAS	M	no	V,P	2 yrs	c	T
UTAH	M	no	V,P	3 yrs	a	N
VERMONT	M	no	V	3 yrs	c	rF
VIRGIN ISLANDS						
VIRGINIA	T	no	V,P	3 yrs	a	W,N
WASHINGTON	T	yes	V,P		f	T
WEST VIRGINIA						
WISCONSIN	M	yes	V,P	5 yrs	f	L
WYOMING	—	no			a	

[1] T = Technical assistance
M = Monitoring
— = state does not do site visits

[2] V = Site visit (CAV or other)
P = Phone contact (CAC or other)
A = Annual report (NFIP or other)
U = Mail survey
R = Review of permits, plans, studies
C = CRS verifications
S = Response to complaints

[3] Authority and responsibility for enforcing local floodplain management:
a = lie with locality
b = are shared between state and locality
c = are shared between FEMA and locality
d = state has final responsibility and authority
e = FEMA has final responsibility and authority
f = are shared by state, locality, and FEMA

[4] T = technical assistance
rF = refer situation to FEMA
N = act as liaison with FEMA
W = warn locality of consequences
L = legal action
I = investigate specifics & document

circumstances. Many states take the position that lack of enforcement is basically an education issue, and their first response is likely to be to supply the locality with additional technical assistance, which could be anything from an explanation over the phone to a site visit at which the violations are investigated and documented. Some states rely heavily on the community sanctions available under the NFIP to pressure a community to remedy its compliance problems. Iowa, Minnesota, and Wisconsin have their own legal recourse. Arizona has found that explaining the potential legal liability the community faces if it does not properly enforce its ordinance is enough to bring about compliance. Ohio withholds state flood disaster assistance from noncompliant communities.

Coordination for Planning

Another key function performed by states is that of coordinating the myriad programs that directly or indirectly affect floodplains. Sometimes the state floodplain management office is the lead agency in such coordination; sometimes it is a participant in a broader process. State coordination for the implementation of specific functions—NFIP activities, natural resource protection, postflood response and recovery, etc.—are described at other points in this report. This section covers state coordination of planning processes that affect floodplain management.

State-Level Planning Coordination

The most common type of state-level coordination for flood loss reduction takes place through the a state hazard mitigation plan and/or state hazard mitigation team. For coordination of planning for flood loss measures, 11 states rely almost exclusively on either the hazard mitigation plan or the team or on *ad hoc* mechanisms set up and managed by their emergency services agency. Eight states indicated they coordinate planning through more than one avenue or through more than one other program, including emergency management, coastal zone management, water planning, wetlands management, and river basin commissions. In nine states, planning is coordinated only on an *ad hoc* basis. Six states have formal, sometimes statutory, arrangements for planning coordination. Florida's Growth Management Act, for example, sets up a three-tiered system (state, regional, local) with mandatory intergovernmental coordination. Florida localities must implement both the three-tiered system and detailed local coordination of specified functions and programs. In Wyoming, the coordination function is handled by the Governor's Office of State Planning Coordination. Four states mentioned that, although a mechanism for coordination exists, budgetary or other constraints prevent much coordination from actually taking place.

State-to-Local Planning Coordination

Nine states said they have no routine means by which local and state-level planning are coordinated, relying instead upon *ad hoc* groups or by-request technical assistance and meetings. Four states use training sessions and workshops to ensure that local plans are coordinated with state efforts. In five states the emergency management agency or hazard mitigation plan is the principal means for coordinating flood loss reduction planning. Six

states have either a designated entity or a more formalized process for coordination. Minnesota, for example, has a law that requires the preparation of plans by counties, watershed districts, and Water Management Organizations. These three entities must submit their draft plans to neighboring communities and to the state for review and comment.

Local Planning Coordination

In 10 states, planning coordination among localities is the responsibility of a designated entity, such as a council of governments, Tennessee's Local Planning Assistance Office, regional planning commissions, area development districts, or drainage improvement districts. In three states most coordination takes place through local participation in professional associations like those for town officials, conservation commissions, and building officials.

Local Hazard Mitigation Planning

The prospect of obtaining local mitigation grants from FEMA, contingent in part upon a locality's having a hazard mitigation plan in place, has provided a new incentive for such planning. States were asked what, if anything, they were doing to help encourage localities to prepare hazard mitigation plans.

Eleven states said that the process would be handled "through the state hazard mitigation plan" or would otherwise be in the hands of the state emergency services agency. In some of these states, a local plan must comply with the state plan. Five state floodplain management offices publicize the new federal mitigation grant program and the requirement for the plan, add discussions of it to training and other meetings, and provide technical assistance upon request. California, Massachusetts, and Wisconsin are developing either model plans for their localities or guidebooks to help them prepare their own hazard mitigation plans. Oklahoma and Washington have other means by which local hazard mitigation planning can take place—Oklahoma through its statewide comprehensive water plan and Washington through the local plans prepared pursuant to the state's Flood Control Assistance Account.

Mapping

Twenty-four states have some kind of independent mapping program that benefits floodplain management, up from 19 states in 1992 (see Table 3). These state programs complement the basic mapping of flood hazard areas conducted in support of the NFIP by the Federal Insurance Administration, the Corps of Engineers, the Natural Resources Conservation Service, the Tennessee Valley Authority, the U.S. Geological Survey, and state and local governments. The annual budgets for the state mapping programs range from $37,000 to Wisconsin's $4-million program.

- 12 states map to reflect changes in development or hydrology (up from 10 in 1992).

3. State Programs for Mapping Floodplain Areas

	To Account for changes in Development or Hydrology	To Provide More Detail or Other Improvements	Areas Subject to Rapid Erosion*	Upstream, Rural, or Rapidly Urban-izing Areas	Areas Below Protective Structures	Natural Areas**	Other***
ALABAMA							
ALASKA							
ARIZONA	X	X		X		X	
ARKANSAS							
CALIFORNIA					X		
COLORADO							X
CONNECTICUT	X	X		X			
DELAWARE			X			X	
DIST OF COLUM							
FLORIDA		X	X			X	X
GEORGIA							
GUAM							
HAWAII							X
IDAHO							
ILLINOIS	X			X	X		X
INDIANA	X	X		X		X	
IOWA							
KANSAS							
KENTUCKY	X				X	X	
LOUISIANA							
MAINE						X	
MARYLAND	X		X	X	X		
MASSACHUSETTS			X				
MICHIGAN		X	X	X		X	
MINNESOTA						X	
MISSISSIPPI				X			
MISSOURI							
MONTANA		X			X		
NEBRASKA	X	X		X	X		X
NEVADA							
NEW HAMPSHIRE							
NEW JERSEY	X	X					
NEW MEXICO							
NEW YORK							
NORTH CAROLINA							
NORTH DAKOTA		X					X
OHIO							
OKLAHOMA	X						X
OREGON							
PENNSYLVANIA							
PUERTO RICO	X	X					
RHODE ISLAND							
SOUTH CAROLINA							
SOUTH DAKOTA							
TENNESSEE		X					
TEXAS							
UTAH							
VERMONT							
VIRGIN ISLANDS	X						
VIRGINIA							
WASHINGTON		X					
WEST VIRGINIA							
WISCONSIN	X	X	X	X	X	X	
WYOMING							

X = State has its own mapping program for this area or for this purpose

*Includes coastal areas

**Includes wetlands

***Includes special flood-related hazards like alluvial fans, subsidence, mudflows, etc.

- 13 states map to provide more detail than that provided in the Flood Insurance Rate Maps (FIRMs), to supply a more appropriate scale, or make other improvements in the maps (up from 7 in 1992).

- 6 states map areas subject to rapid erosion, including coastal erosion (up from 5 in 1992). In some cases this mapping is funded in part under the federal Coastal Zone Management Program.

- 9 states map floodplain areas of special value, such as wetlands, dunes, or natural habitat (up from 7 in 1992).

- 7 states map for other reasons (down from 8 in 1992), including to delineate water management districts, aquifer recharge areas, or land use; to contribute data for dam failure analyses or flood control projects; or to help build a statewide geographic information system .

Besides the independent mapping programs, some states also carry out activities related to mapping done for the NFIP. These include reviewing and/or approving new flood insurance studies conducted for the NFIP and distributing the maps provided by FEMA (see Table 4).

Most floodprone communities administer flood damage reduction ordinances based on FEMA's flood hazard maps. Smaller communities tend to use the basic FEMA maps without adding new development or obstructions; larger and/or better-staffed communities usually draw on other maps when needed to make flood zone determinations or to add special conditions to a building permit. Sometimes communities undertake or contract for a separate flood study to take the place of or supplement the one performed by FEMA.

A rapidly emerging trend at both state and local levels is the development and use of geographic information systems (GISs), which combine digitized geographic data with computer imagery capabilities. Nineteen states have GIS capability. Of those, 10 (Connecticut, Florida, Maryland, Massachusetts, Michigan, New Hampshire, Rhode Island, Utah, Washington, and Wisconsin) have floodplain and coastal data mapped on their GISs. Five states have GIS data that meets NFIP standards. Seven states share the floodplain/coastal GIS data with localities that have GIS capability. When asked to estimate the number of localities with GIS capability, 19 states estimated that no more than 15% of their localities did; 3 states estimated that between 15 and 25% did; Maryland and Ohio estimated 30%; Colorado, 35%; Washington, 40%; and Wyoming estimated that 50% of its localities have GIS capability.

Twenty-two states maintain a five-year mapping priority list that notes which communities need their floodprone areas restudied and possibly remapped. Besides looking to FEMA to help them meet these restudy needs, those states reported that help may be forthcoming from other sources. The Corps of Engineers was the agency most frequently mentioned as a potential source of this remapping assistance, followed by the Natural Resources Conservation Service, the state itself, regional or county-level entities, the U.S. Geological Survey, and the Tennessee Valley Authority.

4. State Activities in Support of the National Flood Insurance Program

	Local Flood Hazard Management Ordinances				Enforcement	
	Prepare Model	Help Adopt	Help Administer	Monitor Administration	Help Local Enforcement	State Enforcement
ALABAMA	X	X	X	X	X	
ALASKA	X	X	X	X	X	
ARIZONA	X	X		X	X	X
ARKANSAS	X	X	X	X	X	
CALIFORNIA	X	X	X	X	X	X
COLORADO	X	X	X	X	X	
CONNECTICUT	X	X		X		
DELAWARE		X	X	X	X	
DISTRICT OF COLUMBIA		X	X			X
FLORIDA		X	X	X	X	
GEORGIA		X	X	X	X	
GUAM						
HAWAII	X	X	X	X		
IDAHO	X	X	X	X	X	
ILLINOIS	X	X	X	X	X	X
INDIANA	X	X	X	X	X	X
IOWA	X	X	X	X	X	X
KANSAS	X	X	X	X	X	X
KENTUCKY	X	X	X	X	X	X
LOUISIANA	X	X	X	X	X	
MAINE	X	X		X		
MARYLAND	X	X	X	X	X	X
MASSACHUSETTS	X	X	X	X	X	
MICHIGAN	X		X	X	X	X
MINNESOTA	X	X	X	X	X	X
MISSISSIPPI	X	X	X	X	X	
MISSOURI	X	X	X	X	X	
MONTANA	X	X	X	X	X	X
NEBRASKA	X	X	X	X	X	X
NEVADA						
NEW HAMPSHIRE	X	X	X	X	X	
NEW JERSEY	X	X		X	X	X
NEW MEXICO	X					
NEW YORK	X	X	X	X	X	
NORTH CAROLINA	X	X	X	X	X	
NORTH DAKOTA	X	X	X	X	X	
OHIO	X	X	X	X		
OKLAHOMA				X	X	
OREGON						
PENNSYLVANIA	X	X	X	X	X	X
PUERTO RICO				X	X	
RHODE ISLAND		X	X	X	X	
SOUTH CAROLINA	X	X	X	X	X	
SOUTH DAKOTA						
TENNESSEE	X			X		
TEXAS	X	X	X			
UTAH		X		X	X	
VERMONT	X	X	X	X		
VIRGIN ISLANDS						
VIRGINIA	X	X	X	X	X	
WASHINGTON	X	X	X	X	X	X
WEST VIRGINIA				X		
WISCONSIN	X	X	X	X	X	X
WYOMING	X					

X = State does this activity

State Activities in Support of the NFIP (cont.)

	Distribute		Make Flood Zone Determinations	Train Local Officials for NFIP	FIS Hydrology & Hydraulics		Community Rating System	
	NFIP Info	Maps			Review	Approve	Assistance	V. Visits*
ALABAMA	X	X		X	X		D,W,M	
ALASKA		X	X	X			D	
ARIZONA	X		X	X	X	X	D,W,M	6
ARKANSAS	X	X		X			D,W	
CALIFORNIA	X			X			M	6
COLORADO	X			X	X	X	D	
CONNECTICUT	X	X		X	X			
DELAWARE	X	X		X			D,W,M	5
DISTRICT OF COLUMBIA	X		X	X	X	X		
FLORIDA	X	X	X	X	X		D,W,M	
GEORGIA	X	X		X	X		D,W	
GUAM								
HAWAII	X	X	X	X	X	X	W	
IDAHO	X	X	X	X			D,W	12
ILLINOIS	X			X	X	X	D,W,M	
INDIANA	X		X	X	X	X	D,W,M	2
IOWA	X		X	X	X	X		
KANSAS	X	X	X	X	X	X	D,W,M	1
KENTUCKY	X	X	X	X	X	X	D,W,M	
LOUISIANA	X	X		X	X		D,W,M	10
MAINE	X	X	X	X			D,W	10
MARYLAND	X		X	X			D,M	7
MASSACHUSETTS	X			X			D,W,M	2
MICHIGAN	X		X	X	X	X	D,W,M	
MINNESOTA	X	X	X	X	X	X	D,W	1
MISSISSIPPI	X	X	X	X			D,W,M	
MISSOURI	X		X	X	X			
MONTANA	X	X	X	X	X	X	D,M	7
NEBRASKA	X	X	X	X	X	X	D	
NEVADA	X	X						
NEW HAMPSHIRE	X	X		X				
NEW JERSEY	X		X	X	X	X	D,W,M	
NEW MEXICO	X							
NEW YORK	X	X		X	X		D,W,M	12
NORTH CAROLINA	X			X	X			
NORTH DAKOTA	X	X	X	X	X		D	
OHIO	X	X		X	X		D,W,M	2
OKLAHOMA	X	X	X	X	X		D,W,M	
OREGON								
PENNSYLVANIA	X			X			M	
PUERTO RICO	X	X	X	X	X			
RHODE ISLAND	X	X	X	X				
SOUTH CAROLINA	X			X			D,W,M	2
SOUTH DAKOTA	X	X	X	X				
TENNESSEE	X			X				
TEXAS	X			X			D,W,M	
UTAH	X	X		X	X		D,W,M	
VERMONT	X	X	X	X	X			
VIRGIN ISLANDS	X	X	X					
VIRGINIA	X			X			D,W,M	
WASHINGTON	X	X	X	X	X		D	
WEST VIRGINIA	X			X				
WISCONSIN	X		X**	X	X	X	D,W,M	4
WYOMING	X			X				

X = State does this activity
*Number of verification visits attended by state staff since 1991
**For local officials only, and very rarely

D = State provides direct assistance
W = State conducts workshops
M = State provides other types of assistance (publications, visual aids)

State Activities in Support of the National Flood Insurance Program

Because the National Flood Insurance Program has become the foundation for much of the management of floodplains in the United States, many state activities focus on the implementation of its procedures and standards. These activities are summarized in Table 4. Many of the activities are funded under FEMA's Community Assistance Program (CAP), but non-CAP states perform some of these services as well. Since 1988 the number of states conducting each of these activities has either increased or remained the same, with the exception of zone determinations, which were discontinued by two states.

The first part of the table lists state activities geared toward assisting local governments in their floodplain management ordinance adoption, monitoring, and enforcement. Two basic forms of assistance are providing a model ordinance and providing assistance in enacting it. Although FEMA has produced model ordinances, state versions that are tied to the state's unique statutory authority, political structure, and flooding conditions are much more useful. Most states offer technical assistance in administering the ordinance, monitor local performance, and help local officials deal with violations. Seventeen states have authority to enforce local regulations in some situations, the same number as in 1992.

The second part of the table begins with information distribution. Virtually all states distribute information about the NFIP. Thirty states distribute the NFIP maps that are provided to them by FEMA, up from 29 in 1992. The maps are distributed—usually only on a "by-request" basis—to other state agencies, to regional commissions, and to other interested parties, such as insurance agents and mortgage lenders. Twenty-eight states make flood zone determinations from the FEMA maps when asked to do so by other state agencies, local governments, or individuals (compared to 30 in 1992). State policies on this activity vary widely; several states will help others read the maps, but leave the final determination to the locality. In some states, this activity is being handled by private companies. Forty-nine states conduct training programs for local officials who administer floodplain regulations, compared to 44 in 1992. Additional ways in which states assist local officials are shown in Table 16.

Thirty states review new flood insurance studies (up from 28 in 1992) to ensure that they are appropriate for the state's use, and provide comments to FEMA. Some states have statutory authority to review maps that will be used as the basis for local floodplain regulations. Fifteen states must approve the maps before they are published, the same number as in 1992 and in 1988.

The last two columns of Table 4 show state activities in support of the Community Rating System (CRS), an aspect of the NFIP that allows localities to obtain reduced flood insurance premium rates for their residents if they undertake activities to prevent or reduce flood losses that go beyond the minimum NFIP requirements. Thirty-three states provide direct assistance to communities in applying for the CRS, the same number as in 1992. Usually this includes answering telephone inquiries and meeting with local officials; some states help localities go step-by-step through the application process. Twenty-seven states held workshops for localities to introduce them to the CRS, its benefits, and the application procedures (down from 30 in 1992). In some cases, the CRS was the topic of a session at an already-scheduled floodplain management workshop; in other cases, entire meetings were devoted to the CRS itself. Twenty-five states (up from 23 in 1992) used other means to help localities, usually some kind of written material such as press releases or visual aids for workshops.

State Activities to Foster Professionalism in Floodplain Management

One of the ways in which states contribute to the growth and influence of floodplain management is by undertaking activities that contribute to the level of professionalism in the field. Table 5 shows four ways in which states are doing this. Two states have certification programs for floodplain managers (down from three in 1992). Maine and New Jersey certify their local code enforcement officers, and floodplain management is included in both programs. Twenty states now have state- or regional-level floodplain management associations (compared to 13 in 1992 and 7 in 1988), and 8 additional states are working to establish them. Their combined membership is over 1,800. These groups provide opportunities for professional interaction, training and education on special issues, building pride and identity, and fostering communication among people engaged in many different aspects of floodplain management.

Twenty-nine states (up from 21 in 1992) publish newsletters about floodplain management. Most are published quarterly, and the rest two or three times a year. The newsletters are distributed to local officials within the state, and most also go to state and federal agencies and private engineering, environmental, or other consulting firms. Some states distribute their floodplain management newsletters to insurance agents, lenders, appraisers, public interest groups, and other professionals. The last three columns in the table show that 18 states license building inspectors (down from 19 in 1992); most of these programs include some kind of continuing education program. In some states, training in floodplain management can be credited toward the continuing education requirement for building inspectors.

State Association Helps Local Officials

The Louisiana Floodplain Management Association (LFMA) reaches out to its affiliates throughout the state by hosting travelling topical forums to help its members, parish and municipal decisionmakers, and others achieve better floodplain management. Volunteers from the LFMA plan and conduct the sessions in different towns every few months. The half-day workshops are designed to meet the needs of local officials: they are short enough to allow travel within the work day, provide concise information presented by different speakers who coordinate their presentations in advance, use visual aids, couch the discussion in site-specific terms as much as possible, distribute information packets, and award certificates of attendance to all those present.

5. State Programs to Foster Professionalism in Floodplain Management

	Certification in Floodplain Management	State Association		Publish Newsletter (# issues/year)	Building Inspectors		
		In Place	Planned		Licensing	Continuing Education	Recertif-ication
ALABAMA					X		
ALASKA		X*		4			
ARIZONA		X		4			
ARKANSAS				4			
CALIFORNIA		X		3 + 6***			
COLORADO		X		3	X	X	
CONNECTICUT		X**		3		X	
DELAWARE				4		X	
DISTRICT OF COLUMBIA							
FLORIDA			X	3	X	X	X
GEORGIA							
GUAM							
HAWAII				2			
IDAHO		X*		4	X	X	X
ILLINOIS		X		4			
INDIANA				2	X		
IOWA							
KANSAS							
KENTUCKY			X	4	X		
LOUISIANA		X		4			
MAINE	X	X**		2-3	X	X	X
MARYLAND				4			
MASSACHUSETTS		X**		2-3		X	
MICHIGAN		X		4	X	X	X
MINNESOTA				4	X	X	X
MISSISSIPPI							
MISSOURI			X				
MONTANA			X	4	X	X	
NEBRASKA							
NEVADA			X		X	X	X
NEW HAMPSHIRE		X**		2-3			
NEW JERSEY	X				X	X	X
NEW MEXICO							
NEW YORK				2	X	X	X
NORTH CAROLINA							
NORTH DAKOTA				4			
OHIO			X	2	X	X	X
OKLAHOMA		X		2	X		
OREGON		X*					
PENNSYLVANIA							
PUERTO RICO							
RHODE ISLAND		X**		2-3		X	
SOUTH CAROLINA			X	4			
SOUTH DAKOTA							
TENNESSEE							
TEXAS		X		4			
UTAH		X		4	X	X	X
VERMONT		X**		2-3			
VIRGIN ISLANDS							
VIRGINIA		X		2	X	X	X
WASHINGTON		X*	X		X		
WEST VIRGINIA							
WISCONSIN				4			
WYOMING							

X = State performs or offers this activity
*Northwest Floodplain Management Association encompasses Alaska, British Columbia, Idaho, Oregon, and Washington
**New England Association of Stormwater and Floodplain Managers encompasses six states
***State publishes three times a year; state association publishes six times a year

Chapter III

ACTIVITIES TO MODIFY HUMAN SUSCEPTIBILITY TO FLOOD DAMAGE AND DISRUPTION

This first strategy of floodplain management consists of tools or activities that will help avoid dangerous, uneconomical, undesirable, or unwise use of floodplain lands. As such, most of them represent more or less permanent relief from most flood risk—now widely known as "mitigation."

Regulations

Floodplain regulations include all activities to control future development of the floodplain. Although each level of government has some authority over private and public development, traditionally it has been the local governments that implement programs to regulate land use. As with mapping, the nation's common denominator is the NFIP, which depends on local government regulation. Local programs, in turn, are dependent on state legislatures for their legal authority and on state agencies for assistance. In addition to authorizing local regulations, many states mandate special procedures or standards that go beyond the federal minimum requirements.

Local Authority

Every state has granted its localities enough authority to meet the regulatory requirements of the NFIP, with two exceptions.

First, most localities do not have the authority to regulate either activities on federal or state property or development by other local governments. Twenty-one states (Alabama, Alaska, Colorado, Delaware, Hawaii, Idaho, Indiana, Kentucky, Maine, Michigan, Mississippi, Montana, Nebraska, New Jersey, North Dakota, Ohio, South Dakota, Vermont, Washington, Wisconsin, and Wyoming) require their state agencies to obtain local development permits for proposed activities within a locality's jurisdiction. In the absence of local regulatory authority, these activities are governed by executive order or by other state or federal statutes. All states do regulate their own development activities in one way or another. For example, 12 states (Arizona, California, Delaware, Hawaii, Massachusetts, Mississippi, Montana, New Hampshire, New Jersey, South Dakota, Wisconsin, and Wyoming) prohibit floodway construction by their state agencies. Twenty-nine states (Alaska, Arizona, Connecticut, Florida, Delaware, Georgia, Idaho, Indiana, Kentucky, Maryland, Massachusetts, Mississippi, Missouri, Montana, New Hampshire, New Jersey, New York,

North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Wisconsin, and Wyoming) require that their state bridge, culvert, and road projects pass the 100-year flood without a rise in water surface elevation. Only two states (California and Missouri) report that their agencies do not routinely comply with minimum NFIP requirements.

Second, many states have statutorily exempted certain other types of activities (besides those of governmental entities) from local regulation, usually those important to the state's economy. Eight states exempt some agricultural activities, three states exempt public utilities, two states exempt small drainage basins, one state exempts private utilities, and one state exempts mining.

Only nine states consider these two categories of exemptions to be exacerbating either the flood hazard or the loss of floodplain resources within the state. Seventeen states reported that the exemptions have no effect either way. One state noted that the state's regulation of its own activities was probably reducing flood damage; one state thought that exempting agriculture was helping to restore floodplain resources.

Only 10 states thought that federal activities and regulations were having a deleterious effect on flood problems and floodplain resources. Alaska, for example, noted that federal exemption from local permitting results in at-risk buildings and other projects. But 29 states consider the federal impacts negligible or even beneficial.

Local regulation of flood hazard areas is almost universal. Most communities have zoning ordinances that restrict floodplain development, building standards that govern floodplain construction, and subdivision regulations for residential areas under development. Local sanitary and well codes often have specific provisions for flood hazard areas. In larger communities and urban areas, stormwater management is used to help prevent surface runoff from exacerbating flooding of water bodies or from causing localized street flooding.

State Assistance to Local Programs

Although federal and state mandates to regulate the flood hazard and local authority to do so have all been established, local regulations, especially in smaller communities, often are not adequately administered unless the local personnel receive some technical assistance. In small communities, zoning administrators and building inspectors are usually part-time officials with little or no formal training, and engineering expertise is usually not readily available. Considerable state effort, therefore, goes into helping ensure that local regulatory programs are being as effective as possible. Most of these types of state assistance are covered in Table 4, because of the NFIP's central role in the process, and they include providing model ordinances tailored to the state and local situation, helping enact them, providing information to and answering questions from local officials, conducting training programs, and publishing handbooks about how to administer floodplain regulations. Most states also monitor local performance and help local officials deal with violations. About half the states regulate some floodplain areas directly, or have the authority to do so if localities fail to adopt or enforce the necessary ordinances (see Tables 4, 6, 7, 8, and 9).

Regulatory Standards Exceeding NFIP Minimums

All states now allow localities to regulate to the federal (NFIP) standard, but some states also require that their localities regulate to a higher standard for certain aspects of floodplain management. Although most localities have ordinances that meet only the minimum NFIP or state criteria, hundreds do have provisions that exceed those standards in one way or another. Specific state and local regulations that go beyond the federal standards are detailed in this section.

Riverine Standards Table 6 shows that 24 states have some kind of riverine standards more restrictive than those of the NFIP (down from 25 in 1992). Of those, 10 require that localities regulate to the higher standard; three states have opted to implement and enforce the higher standard directly; and 10 states use a combination of both approaches. Although the total number of states with higher standards is a little lower than in 1992, since then six states that already had higher standards strengthened their riverine regulatory programs even more. Illinois, Indiana, Kentucky, Michigan, Montana, and New Hampshire have prohibited buildings or residences from their floodways at least in some areas; Indiana and New Hampshire also added provisions to allow the state or other agency to regulate directly if a locality fails to do so. But two states—New York and Utah—eliminated their higher floodway and flood fringe standards, while California eliminated its strengthened floodway standard. Nebraska shifted from direct state regulation to requiring localities to meet the state standard.

Twelve states allow less than a one-foot rise in the floodway (the federal standard)—the same number as in 1992. Nineteen states have flood fringe standards that exceed those of the NFIP, one fewer than in 1992.

States are more likely to regulate some or all of the floodways than the flood fringes, because they require more technical expertise than those that apply to the fringe and because the impacts of floodway development are more extensive, often going beyond the corporate (local regulatory) limits.

Coastal and Lakeshore Standards As shown in Table 7, 32 states have enacted some regulations governing shoreline development. For states with ocean or bay coasts, this regulatory authority is usually implemented under the state's coastal zone management program. All the Great Lakes states have lakeshore regulatory standards or permit programs, usually administered as part of state shoreland management programs (most of which were created before the federal Coastal Zone Management Program). The overall picture for coastal and lakeshore regulation has changed a little in the past three years. Maryland and New York eliminated their higher standards for coastal high hazards; Iowa, New York, and Utah eliminated their standards for lakeshores; New York eliminated its higher protection for sand dunes, and Utah dropped its shoreline erosion provision. At the same time, however, Florida, Montana, New Hampshire, Rhode Island, and Wisconsin added one or more components to their coastal and lakeshore regulations that exceed NFIP minimum standards.

Sixteen states regulate areas subject to coastal erosion, one fewer than in 1992. Sixteen states now have regulations or standards to preserve or protect sand dunes, the same number as in 1992. Sixteen states regulate or set higher standards for lakeshore areas, one fewer than in 1992. Twenty-three states now have standards for their coastal high hazard areas that exceed those of the NFIP, one fewer than in 1992.

States were asked general questions about erosion in their jurisdictions. Thirty-one states said they had communities located in coastal areas or on lakeshores, for a total of about 1,500

6. State Riverine Regulatory Standards that Exceed NFIP Minimums

	Floodway Standards	Floodway Rise	Fringe Standards
ALABAMA			
ALASKA			
ARIZONA	L	0′	L
ARKANSAS			
CALIFORNIA			L, +
COLORADO			
CONNECTICUT	A,S		
DELAWARE			
DISTRICT OF COLUMBIA			
FLORIDA	S,L		
GEORGIA			
GUAM			
HAWAII			
IDAHO			
ILLINOIS	S,L,P,A	0.1′	
INDIANA	S,L,P, +	0.1′	L
IOWA	S,L	D	S,L
KANSAS	L, +		L, +
KENTUCKY	S,L,P, +	D, 0′	S
LOUISIANA			
MAINE	A,S,L		
MARYLAND	S,L	D	S,L
MASSACHUSETTS	S,L	0′	S,L
MICHIGAN	S,P,L	D	S
MINNESOTA	L, +,P,R	D	L, +
MISSISSIPPI			
MISSOURI			
MONTANA	L,P, +	0.5′	L, +
NEBRASKA	L		L
NEVADA			
NEW HAMPSHIRE	P, +		
NEW JERSEY	S	0.2′	S
NEW MEXICO			
NEW YORK			
NORTH CAROLINA			
NORTH DAKOTA	+		
OHIO	A		A
OKLAHOMA			
OREGON	L		L
PENNSYLVANIA	S,L		L
PUERTO RICO	S		S
RHODE ISLAND			
SOUTH CAROLINA			
SOUTH DAKOTA			
TENNESSEE			
TEXAS			
UTAH			
VERMONT			
VIRGIN ISLANDS			
VIRGINIA			
WASHINGTON	L,P		L
WEST VIRGINIA			
WISCONSIN	L	0.01′	L
WYOMING			

A = Rules apply only in certain areas
D = Depends upon impact to existing development
L = Local regulations must meet state requirements
P = Buildings or residences prohibited from floodway
S = State directly regulates development
+ = State or other agency directly regulates or enforces if locality does not

7. Coastal and Lakeshore Regulations

	Coastal High Hazard Area	Lakeshore	Sand Dunes	Coastal Erosion
ALABAMA	S		S	
ALASKA	S			
ARIZONA				
ARKANSAS				
CALIFORNIA	S		S	
COLORADO				
CONNECTICUT	S		S,L	
DELAWARE	S,L		S	S
DISTRICT OF COLUMBIA				
FLORIDA	S,L	A,S,L	S,L	A,S,L
GEORGIA	S		S	A,S,L,+
GUAM				
HAWAII	S			L
IDAHO				
ILLINOIS		A,S		
INDIANA		S		
IOWA				
KANSAS				
KENTUCKY		S		
LOUISIANA	L			L
MAINE	A,S,L	S,L	A,S,L	S
MARYLAND				S
MASSACHUSETTS	S,L	S,L	L	L
MICHIGAN	L	A,S	S	L,+
MINNESOTA	L	L		L
MISSISSIPPI	S			
MISSOURI				
MONTANA		A		
NEBRASKA				
NEVADA				
NEW HAMPSHIRE	L	S	S	
NEW JERSEY	S		L	
NEW MEXICO				
NEW YORK				L,+
NORTH CAROLINA	S,L		S,L	S,L
NORTH DAKOTA				
OHIO		S,L		S,L
OKLAHOMA				
OREGON	L	L	L	L
PENNSYLVANIA		L		
PUERTO RICO	S	S	S	S
RHODE ISLAND	S,A,L		S	
SOUTH CAROLINA	S		S	S
SOUTH DAKOTA		S		
TENNESSEE				
TEXAS	A,S			
UTAH				
VERMONT				
VIRGIN ISLANDS				
VIRGINIA				
WASHINGTON				
WEST VIRGINIA				
WISCONSIN	L	L		
WYOMING				

A = Rules apply only in certain areas
L = Local regulations must meet state requirements
S = State directly regulates development
+ = State will regulate directly if localities do not

communities nationwide. Of these, about 600 are considered to have a recognized erosion hazard. The state estimates of the number of buildings at risk from erosion in those communities totalled between 4,600 and 4,800 structures. Ohio accounted for over half of this total, with an estimated 2,500 structures at risk, mostly along Lake Erie.

Other Regulatory Standards Table 8 shows the variety of other regulatory activities states have undertaken to restore and preserve their floodplains and reduce flood losses.

Nineteen states have stricter building construction requirements than does the NFIP (two more than in 1992). The most common additional standard is freeboard—requiring new buildings to be elevated higher than the base (100-year) flood level. This standard may apply to all buildings in the floodplain or only to certain types, such as new jails, hospitals, nursing homes, mobile home parks, or hazardous materials facilities. Another strict construction standard prohibits new buildings or residences in the floodplain or floodway. Twenty-five states (up from 21 in 1992) either directly regulate the handling and storage of stormwater in their jurisdictions or establish standards that localities must meet. Thirty states (up from 28 in 1992) have regulations or standards for the control of erosion and sediment.

Construction or development setbacks are used by states and localities for a variety of reasons, including reducing damage in marginally floodprone areas, preventing or minimizing erosion, and preserving habitat or other valuable natural features, such as dunes. Twenty-three states (compared to 22 in 1992) have either direct regulations or state standards to restrict or prohibit some or all development within a certain distance from bodies of water. Sixteen of those have setbacks for coastal and/or lakeshore areas; three have standards for inland streams only; and four states have standards for both.

There is a wide variety in the purpose and length of the setbacks. Some states have established a survey line a certain distance from a coastal feature—a bluff, dune, high tide line, etc.—and allow construction only landward of that line. For example, Delaware has a "coastal building line," which approximates the landward toe of dunes"; Alabama has a "coastal construction control line," which is about 40 feet behind the primary dune crest; New Hampshire has a "primary building line," about 50 feet from high water. Wisconsin's statewide setback is 75 feet from the high water mark for most structures; Maine's is 250 feet from mean high water; New York's erosion setback is 25 feet from the landward limit of a bluff; Rhode Island's varies from 25 to 50 feet from coastal features or buffer zones. Minnesota's system of setbacks includes three categories for lakes, with setbacks varying from 50 to 150 feet and six categories for rivers, with setbacks varying from 50 to 600 feet. A few states have requirements only for specific areas: Maryland requires a 100-foot setback from Chesapeake Bay; Ohio's setback from Lake Erie is the 30-year erosion line.

Twenty-three states noted that at least some of their localities use setbacks for one reason or another.

- About 90% of Maryland's floodprone communities (up from 75% three years ago) have voluntarily adopted 100-foot setbacks along FEMA-mapped streams and 50-foot setbacks along unmapped streams.

- In Alaska, construction setbacks are established by the coastal districts. Mat-Su Borough has a 75-foot setback from all water bodies; Anchorage has a 50-foot setback.

8. Other Regulatory Standards for Floodplains

	Building Standards beyond NFIP	Stormwater Management	Erosion & Sediment Control	Setbacks
ALABAMA				C
ALASKA			S,A	
ARIZONA	F:1′	A		
ARKANSAS				
CALIFORNIA				C, +, A
COLORADO		L		
CONNECTICUT	L	A	L	C
DELAWARE	A	S	S	C
DISTRICT OF COLUMBIA		S	S	
FLORIDA	A	L	S,L	
GEORGIA		S	S,L, +	C,R,A
GUAM				
HAWAII				C
IDAHO				
ILLINOIS	A,P			
INDIANA	F:2′,L,P,S, +			
IOWA	F:1′			
KANSAS	F:1′			R
KENTUCKY	P	L	L,S	R
LOUISIANA				
MAINE	F:1′	S,A	S	C,R
MARYLAND	F:1′	S,L	S,L	C,A
MASSACHUSETTS		L	L	
MICHIGAN	P,F:1′,A		S	C,R,A
MINNESOTA	F:1′,P	S		C,R
MISSISSIPPI		S,L	L	C
MISSOURI		S	S	
MONTANA	F:2′		S,L	
NEBRASKA	F:1′		S,L	
NEVADA				
NEW HAMPSHIRE				C
NEW JERSEY	P,S,L	L	L	
NEW MEXICO				
NEW YORK		L	L	C,A,L, +
NORTH CAROLINA				
NORTH DAKOTA				
OHIO		L	L	C,,A
OKLAHOMA				
OREGON				
PENNSYLVANIA	A,F:1.5′	L	S	
PUERTO RICO	S	S	S	C
RHODE ISLAND			L	C
SOUTH CAROLINA		S	S	C
SOUTH DAKOTA			L	
TENNESSEE				R,A
TEXAS				
UTAH			S,L	
VERMONT		S	S	
VIRGIN ISLANDS		S,L	S,L	C
VIRGINIA	L	L	L	
WASHINGTON	P	L	L	C
WEST VIRGINIA			S	
WISCONSIN	F:2′,P	L	L	C,A
WYOMING				

A = Rules apply only in certain areas
F = Freeboard
L = Local regulations must meet state requirements
C = Coastal (and lakeshore)
R = Riverine
P = Buildings or residences prohibited from floodway
S = State directly regulates development
+ = State or other agency directly regulates or enforces if locality does not

- Pima County and Tucson, Arizona, have setbacks based on the 100-year flow; Cochise County enforces riparian area protection setbacks on some streams.
- Port Arthur, Texas, has a setback of 200 feet landward of the vegetation line.
- A number of California localities have setbacks, some designed to prevent flood damage, some to protect water quality, and some to preserve riparian areas.

Special Hazards Special hazards are dangers that accompany flooding and cause damage greater than that caused by typical flood waters. Table 9 reveals that, except for hazardous materials and issues of public health (such as avoiding septic systems in floodplains), most states have not yet addressed these hazards. Most of those that have done so regulate them directly rather than mandating local regulations.

Fourteen states (up from 13 in 1992) have special rules for areas that lie below dams or are protected by levees. Alluvial fans and mud floods, usually of concern in the West, are being regulated by only two states (down from three in 1992 and four in 1988). Thirty states have adopted measures to regulate hazardous materials in floodplains (up one from 1992); 29 states have special public health standards that apply to floodplains (up from 26 in 1992).

Development and Redevelopment Policies

Although development policies are most often implemented at the local level, every state now has a statute or executive order to govern construction of state projects, such as prisons and universities, that are exempt from local regulations. Table 10 lists the executive orders (and their dates) issued by governors that set policies for state action with regard to floodplain management, wetlands protection, hazard mitigation, and other issues. It shows that 24 state governors have issued a directive on floodplain management. Most of these were implemented to meet the minimum NFIP requirements but many go beyond them. Five states have wetlands policy set by executive order, five have orders on hazard mitigation or disaster recovery, and two states have other resource protection executive orders that affect floodplains. These are discussed in Chapter VI.

Many small and even medium-sized communities have no formal development or redevelopment policies or procedures for evaluating the long-term impacts of a proposed action, but larger communities or those with a salient flood problem do take steps to affect future development. More and more communities of all sizes are acquiring at least portions of their floodplains and dedicating them to open space. Described below are some of the other programs and policies that states have to encourage the wise development and redevelopment of floodprone lands.

9. State Regulations for Special Flood Hazards

	Below Dams	Behind Levees	Alluvial Fans	Mud Floods	Public Health	Hazardous Materials
ALABAMA					S	
ALASKA					X	
ARIZONA			L		X	X
ARKANSAS						
CALIFORNIA	S				X	X
COLORADO	S,A				X	X
CONNECTICUT						S,X
DELAWARE						
DISTRICT OF COLUMBIA						X
FLORIDA	S	S			L	L
GEORGIA						
GUAM						
HAWAII					X	X
IDAHO						
ILLINOIS					X	X
INDIANA						
IOWA	S	S				X
KANSAS					L	X
KENTUCKY					S+	S+
LOUISIANA					S,L	S
MAINE					X	X
MARYLAND	S				X	X
MASSACHUSETTS					S,L	
MICHIGAN		S			X,L	X
MINNESOTA	S,L	L			L	L
MISSISSIPPI						
MISSOURI						
MONTANA					X	X
NEBRASKA						
NEVADA						X
NEW HAMPSHIRE					X	
NEW JERSEY					X	X
NEW MEXICO						
NEW YORK					X	X
NORTH CAROLINA						
NORTH DAKOTA						
OHIO					L	X
OKLAHOMA	A				X	
OREGON	L	L	L	L		
PENNSYLVANIA					X	X
PUERTO RICO	S	S			S	S
RHODE ISLAND						
SOUTH CAROLINA	S				X	X
SOUTH DAKOTA					X	X
TENNESSEE					X	
TEXAS					X	X
UTAH	S	S				X
VERMONT						
VIRGIN ISLANDS						
VIRGINIA					X	
WASHINGTON						X
WEST VIRGINIA						
WISCONSIN	L	L			X	X
WYOMING	A					

A = Rules apply only in certain areas
L = Local regulations must meet state requirements
S = State directly regulates development
X = State has regulatory standards for this hazard
+ = State will directly regulate if localities do not

10. Governors' Executive Orders for Flood Loss Reduction

	Floodplain Management	Wetlands Protection	Hazard Mitigation	Other
ALABAMA				
ALASKA				
ARIZONA	X 1977			
ARKANSAS				
CALIFORNIA	X 1977	X 1993		
COLORADO	X 1977			
CONNECTICUT	X	X		X*
DELAWARE				
DISTRICT OF COLUMBIA				
FLORIDA	X 1986			
GEORGIA	X			
GUAM				
HAWAII				
IDAHO	X 1992			
ILLINOIS	X 1979	X		
INDIANA	X			
IOWA				
KANSAS				
KENTUCKY				
LOUISIANA				
MAINE	X			
MARYLAND				
MASSACHUSETTS	X 1978			X** 1980
MICHIGAN	X 1977			
MINNESOTA				
MISSISSIPPI	X	X	X	
MISSOURI	X 1982		X	
MONTANA				
NEBRASKA				X*** 1995
NEVADA				
NEW HAMPSHIRE				
NEW JERSEY			X	
NEW MEXICO				
NEW YORK				
NORTH CAROLINA				
NORTH DAKOTA	X 1977			
OHIO		X 1994		
OKLAHOMA	X			
OREGON				
PENNSYLVANIA	X 1975			
PUERTO RICO				
RHODE ISLAND	X 1978			
SOUTH CAROLINA	X 1980			
SOUTH DAKOTA				
TENNESSEE	X			
TEXAS	X 1974			
UTAH				
VERMONT	X 1982			
VIRGIN ISLANDS				
VIRGINIA	X 1976			
WASHINGTON				
WEST VIRGINIA				
WISCONSIN	X 1985		X	
WYOMING				

X = State's governor has issued an executive order covering this issue
*Coastal areas management
**Management of barrier beaches
***Task force for disaster recovery

Acquisition and Relocation

Public acquisition of floodprone land and structures is a way to permanently reduce or eliminate susceptibility to flood damage. It also yields the additional benefit of the recreational and natural value of the open space that remains after any buildings are relocated or demolished. Twenty-two states have policies or programs specifically for acquisition and relocation—a fair increase from 16 in 1992, and 13 of them have funds either for direct state purchase of the land or buildings or to assist local purchases (up from 10 in 1992) (Table 11).

States have many different kinds of acquisition programs. Some states make a point of promoting the option of acquisi-tion and relocation and helping flooded communities obtain federal funds. Some states have programs to acquire lands for a variety of non-flood-related purposes (such as recreation or habitat preservation), but give priority to floodprone lands when deciding how to spend the funds. Some states have used community development block grants to relocate and rebuild floodprone houses.

Many specific acquisition and relocation projects have been planned and implemented at the instigation of the locality; sometimes they are carried out in cooperation with federal and state agencies and private interests.

State of Illinois Acquisition/Relocation

After the Midwest floods of 1993 the State of Illinois formed an Interagency Mitigation Advisory Group made up of representatives of 23 state, federal, and local agencies to plan and implement a series of projects to acquire flood-damaged properties and enable the residents to relocate to non-floodplain areas. Over the course of two years they worked with 37 jurisdictions, found 1800 voluntary participants, planned 109 infrastructure projects, and tackled the relocation of one entire community and portions of four others. The structures being bought out are mostly primary homes, with some businesses, churches, second homes, vacant lots, and farm residences. Development rights to nearly 20,000 acres of agricultural land on the floodplains are also being acquired. By the summer of 1995 about half of the property sales had been completed. The newly cleared floodplain areas will remain in public ownership and kept as open space. Agricultural use (no residences) will continue on some of the land.

Local Acquisition/Relocation

After a disastrous ice-jam-caused flood in April 1994, the Town of Fort Fairfield, Maine, began considering alternative solutions to its chronic flood problem. The flood waters typically damaged residences and businesses along the north side of the Aroostook River, and after a series of damaging floods, many of those property owners were ready to think about moving to higher ground. The next month the Maine Emergency Management Agency and the Federal Emergency Management Agency hosted a meeting of federal, state, and local agencies to outline a mitigation plan: one of the outcomes was a voluntary program to acquire and/or relocate flood-damaged residences. By the end of 1994, 12 homeowners had already sold their property to the Town, and about 30 more had agreed to do so or were in negotiations. Each public purchase involved as many as six sources of funding. A grant from the Maine State Housing Authority made possible the extension of infrastructure into a new, upland area owned by the Town. This provided about 20 lots for new construction.

Existing structures on the newly acquired properties will be demolished and the site prepared to create an open space suitable for summer and winter recreation. Planning for further recreational uses has begun, and the town has been designated the entry point of the Appalachian Trail into Canada.

Redevelopment Policies

Thirteen states (down from 16 in 1992) have post-flood redevelopment policies designed to mitigate future losses by being sure that the reconstructed area is less prone to damage (Table 11). Twenty states have officially adopted substantial damage standards for statewide use. All of them use the NFIP's 50% threshold, but seven states (Alabama (in some cases), Arizona, Indiana, Kentucky,

11. State Policies and Programs for Development and Redevelopment of Floodprone Areas

	Acquisition/Relocation		Redevelopment Policies*	Road & Bridge Standards*	
	Program	Funding		State Roads	Local Roads
ALABAMA	H				
ALASKA	A	L			
ARIZONA	H	L	R	X	
ARKANSAS				X	
CALIFORNIA				X**	X**
COLORADO	H		M		
CONNECTICUT	P,A	L,S		X	
DELAWARE			R		
DISTRICT OF COLUMBIA				X	X
FLORIDA	P	S,L	M,R	X	X
GEORGIA					
GUAM					
HAWAII					
IDAHO					
ILLINOIS	H,P	L,S		X	X
INDIANA	H		R	X	X
IOWA				X	X
KANSAS				X	X
KENTUCKY	H,P				
LOUISIANA	P	S,L		X	X
MAINE	H	L	M	X	
MARYLAND	H,P	L		X	X
MASSACHUSETTS	P,A,H				
MICHIGAN	H,			X	X
MINNESOTA	H,P	L	R	X	X
MISSISSIPPI	H,P			X	X
MISSOURI	H,P	L		X	
MONTANA			R	X	X
NEBRASKA	H			X	X
NEVADA					
NEW HAMPSHIRE				X	
NEW JERSEY			M	X	X
NEW MEXICO					
NEW YORK					
NORTH CAROLINA					
NORTH DAKOTA					
OHIO				X	X
OKLAHOMA				X	
OREGON					
PENNSYLVANIA				X	
PUERTO RICO	A	S			
RHODE ISLAND	P	L			
SOUTH CAROLINA			M	X	
SOUTH DAKOTA				X	
TENNESSEE					
TEXAS				X	X
UTAH			M	X	
VERMONT				X	
VIRGIN ISLANDS					
VIRGINIA	P,A		R	X	
WASHINGTON					
WEST VIRGINIA				X	
WISCONSIN	A,H	L	R	X	X
WYOMING					

*exceeding NFIP minimums

H = State helps localities obtain federal acquisition funds

P = State gives priority to floodplains in its acquisition programs

A = State has other acquisition program (erosion-prone structures, etc.)

**in certain areas only

L = Loans or grants are provided by the state for local purchase of floodprone structures or land

S = Direct purchase by the state of floodprone structures or land

R = Reconstruction of buildings to standards exceeding NFIP

M = Other policy or program beyond NFIP standards

Michigan, Washington, and Wisconsin) use a cumulative procedure to reach that threshold. That is, each time a structure is damaged by a flood, the percentage of damage is added to the percentage suffered in any previous flood; thus after a certain number of damaging events, the structure crosses the threshold and flood-resistant building restrictions apply. Ten states use the "market value" to determine the percentage of damage; five states specify the "preflood value"; Wisconsin uses the "equalized assessed value"; Indiana compares the cost of repairs to the preflood market value; and New Jersey uses the "square foot replacement value."

Standards for Road and Bridge Construction

The minimum requirements of the NFIP restrict construction of roads and bridges only if they will create a floodway encroachment, and the Federal Highway Administration requires that any federal-aid highways meet the NFIP standards. Interstate highways, however, must meet higher standards. As shown in the last two columns of Table 11, 32 states also have stricter rules for their state highways (down from 33 in 1992 and from 35 in 1988), and 18 for their local roads (the same number as in 1992). The specific standards vary from state to state.

Disaster Preparedness and Assistance

Every state has an emergency management or disaster preparedness agency for floods and other natural hazards. Every Gulf and Atlantic-coast state has a hurricane preparedness plan either completed or in progress. These plans are done in association with FEMA, the Corps of Engineers, and the National Weather Service, and are based on computer models of hurricane impacts and evacuation studies.

Most state floodplain managers are not directly involved in disaster preparedness, simply because of the way in which most state governments are organized. For this reason, these topics are not fully explored in this report. Many floodplain managers do, however, distribute information about preparing for floods, and these tasks are incorporated in Table 16. State and local disaster assistance activities are discussed in the sections on Emergency Measures and Postflood Recovery at the end of Chapter V.

Floodproofing

Forty-six states (up from 45 in 1992) now provide information about floodproofing or retrofitting floodprone buildings directly to interested property owners (Table 12). This information usually consists of publications or responses to specific inquiries. Other outreach techniques that have been used include conferences and workshops, demonstrations, videos, and field trips. Eight states directly fund floodproofing through grants or loans.

Because they have no pertinent in-house technical expertise, most communities rely on the assistance of state or federal agencies for floodproofing. In 24 states (up from 20 in

12. State and Local Floodproofing Activities

	State			Local	
	Information and Technical Assistance	Publications	Funding*	Information	Funding*
ALABAMA	X				
ALASKA	X	X			
ARIZONA	X	X			
ARKANSAS	X				
CALIFORNIA	X			X	
COLORADO	X	X		X	
CONNECTICUT	X	X		X	
DELAWARE	X			X	
DISTRICT OF COLUMBIA	X			X	
FLORIDA	X	X	X	X	X
GEORGIA	X	X			
GUAM					
HAWAII	X	X			
IDAHO	X				
ILLINOIS	X	X	X	X	X
INDIANA	X	X		X	
IOWA	X				
KANSAS	X				
KENTUCKY	X			X	X
LOUISIANA	X	X			
MAINE	X		X		
MARYLAND	X			X	X
MASSACHUSETTS	X	X			
MICHIGAN	X	X		X	
MINNESOTA	X		X	X	
MISSISSIPPI		X	X	X	X
MISSOURI	X				
MONTANA	X			X	
NEBRASKA	X				
NEVADA	X			X	
NEW HAMPSHIRE	X			X	
NEW JERSEY	X			X	X
NEW MEXICO					
NEW YORK	X				
NORTH CAROLINA					
NORTH DAKOTA	X				
OHIO	X				
OKLAHOMA	X			X	X
OREGON					
PENNSYLVANIA	X	X	X		
PUERTO RICO	X	X			
RHODE ISLAND		X			
SOUTH CAROLINA	X			X	
SOUTH DAKOTA	X			X	
TENNESSEE	X				
TEXAS	X	X			X
UTAH	X	X	X	X	
VERMONT	X			X	
VIRGIN ISLANDS					
VIRGINIA	X	X		X	X
WASHINGTON	X				X
WEST VIRGINIA					
WISCONSIN	X	X	X	X	X
WYOMING	X				

*Grant or loan, but does not include community development block grants or other general-purpose programs that may be used to fund floodproofing efforts

X = This floodproofing activity is conducted by level of government indicated

13. State Activities to Provide Flood Warnings

	Data Collection	State-operated Warning System*	Help Locals Develop System	
			Information	Funding
ALABAMA	X		X	
ALASKA	X**	X	X	X
ARIZONA	X	X	X	X
ARKANSAS				
CALIFORNIA	X	X	X	X
COLORADO	X	X	X	
CONNECTICUT	X	X	X	X
DELAWARE	X	X	X	
DISTRICT OF COLUMBIA				
FLORIDA	X	X	X	X
GEORGIA				
GUAM				
HAWAII	X	X	X	X
IDAHO			X	
ILLINOIS	X		X	
INDIANA	X		X	X
IOWA				
KANSAS			X	
KENTUCKY	X	X	X	
LOUISIANA			X	X
MAINE	X			X
MARYLAND			X	X
MASSACHUSETTS			X	
MICHIGAN	X		X	
MINNESOTA	X	X	X	X
MISSISSIPPI	X		X	X
MISSOURI	X	X	X	X
MONTANA				
NEBRASKA	X		X	X
NEVADA				
NEW HAMPSHIRE	X	X		
NEW JERSEY	X		X	
NEW MEXICO	X	X		
NEW YORK				
NORTH CAROLINA	X	X	X	X
NORTH DAKOTA				
OHIO	X	X	X	
OKLAHOMA			X	X
OREGON				
PENNSYLVANIA	X	X	X	X
PUERTO RICO	X	X		
RHODE ISLAND				
SOUTH CAROLINA	X		X	
SOUTH DAKOTA	X	X	X	
TENNESSEE			X	
TEXAS			X	X
UTAH	X		X	X
VERMONT				
VIRGIN ISLANDS				
VIRGINIA	X	X	X	
WASHINGTON			X	X
WEST VIRGINIA	X	X	X	
WISCONSIN	X	X	X	
WYOMING	X		X	

*Besides those of the National Weather Service

**Alaska operates a tsunami warning system.

X = State conducts this activity

1992), at least some localities distribute information about floodproofing; in 11 states localities will fund floodproofing (up from five in 1992).

There is little quantitative evidence about the extent to which floodproofing is used. In a previous survey, only 20 state respondents were able to estimate the number of retrofitted (retroactively floodproofed) structures in their jurisdictions. Of those, 12 thought there were fewer than 50 floodproofed buildings in each of their states, and 8 estimated the number to be between 50 and 1,000. The vast majority of floodproofed structures were thought to be residences. Elevation in place was by the most commonly applied technique, followed by berms, and then by elevation of utilities.

Forecasting and Warning Systems

As shown in Table 13, 32 states collect such flood warning data as rainfall, streamflow, snow pack, and reservoir levels—the same number as in 1992. Twenty-one states operate flood warning systems (down from 23 in 1988), typically for just a few watersheds rather than for the whole state.

States also help set up local or regional warning systems. Thirty-seven states now provide information or technical assistance, compared to 36 in 1992, and 20 provide funding for local warning systems, the same number as three years ago.

Virtually all floodprone communities have access to NWS severe weather warnings. Even the smaller communities have some sort of response capability, although it may limited to the routine emergency measures taken by the fire and police departments.

Chapter IV

ACTIVITIES TO MODIFY FLOODING

Structural projects, intended to alter the nature of flooding, have been an historically popular approach to flood problems, and represent the second major strategy of floodplain management. Some aspects of the use of this strategy among states today are summarized in Table 14. This is not a full reflection of all the structural flood control work done by states, however, since in most states these programs are separate from floodplain management. Thirty-five states have programs to plan, construct, or implement some kind of structural flood control measure, sometimes in cooperation with federal projects. Thirty-eight states provide technical assistance on structural flood control alternatives to communities, and 31 states provide full or partial funding for structural projects. All of these figures are slightly higher than they were in 1992 and in 1988.

Table 15 shows which structural measures receive what kind of attention at state and local levels. Thirty-five states regulate the construction of new dams (up from 23 states in 1992); 46 states and one territory (the same number as in 1992) have programs to periodically inspect dams to ensure that they are well maintained. Twenty-two states have special regulations for the construction of levees (up from 17 in 1992 and 13 in 1988).

There are standards for stormwater management (either for direct state regulation or for local compliance) in 22 states (up from 21 in 1992). Seven states indicated that stormwater management was a local matter without state-level involvement. The last four columns in Table 15 show a varied array of state and local cooperation in specific measures to modify flooding—channel clearance and alteration, onsite retention, land treatment, and high-flow diversions. In some states all these techniques are left to local determination and implementation; in others the state takes a stronger role, setting standards or even carrying out the project itself. Seventeen states make some funding available for one or more of these structural measures (up from 14 in 1992).

14. State Activities to Modify Flooding

	Undertaking Structural Projects*	Providing Technical Assistance**	Providing Project Funding***
ALABAMA	X	X	X
ALASKA		X	
ARIZONA	X	X	X
ARKANSAS	X	X	X
CALIFORNIA	X	X	X
COLORADO	X	X	X
CONNECTICUT	X	X	X
DELAWARE	X	X	X
DISTRICT OF COLUMBIA			
FLORIDA	X	X	
GEORGIA		X	X
GUAM			
HAWAII	X	X	X
IDAHO	X	X	
ILLINOIS	X	X	X
INDIANA	X	X	X
IOWA			
KANSAS	X		
KENTUCKY	X	X	X
LOUISIANA	X	X	X
MAINE		X	
MARYLAND	X	X	X
MASSACHUSETTS	X	X	X
MICHIGAN	X	X	
MINNESOTA	X	X	X
MISSISSIPPI			X
MISSOURI	X	X	
MONTANA		X	
NEBRASKA		X	X
NEVADA	X		X
NEW HAMPSHIRE			X
NEW JERSEY	X		X
NEW MEXICO			
NEW YORK	X	X	X
NORTH CAROLINA	X	X	X
NORTH DAKOTA	X	X	X
OHIO	X	X	X
OKLAHOMA	X	X	X
OREGON			
PENNSYLVANIA	X	X	X
PUERTO RICO	X	X	X
RHODE ISLAND			
SOUTH CAROLINA	X		
SOUTH DAKOTA		X	
TENNESSEE		X	
TEXAS	X		
UTAH	X	X	X
VERMONT			
VIRGIN ISLANDS			
VIRGINIA	X	X	X
WASHINGTON	X	X	X
WEST VIRGINIA	X	X	
WISCONSIN		X	
WYOMING			

*Of any kind (dams, levees, channels, diversions, etc.); planning, construction, and/or implementation
**In planning for flood control, flood hazard mitigation, or both
***Full or cost-share

15. Structural Measures used by States and Localities

	Dams		Regulate Levees	Stormwater Management	Channel Clearance/ Alteration	Onsite Retention	Land Treatment	High-flow Diversions
	Safety Inspections	Regulate New Construction						
ALABAMA								
ALASKA	S				L	L	L	
ARIZONA	S	S	S	L	L	L	L	L,R
ARKANSAS	S	S			F,L	L	L	L
CALIFORNIA	S	S	S	L	S,R	L		S
COLORADO	S	S		M				
CONNECTICUT	S	S	S	L	R	L	L	R
DELAWARE	S			R	S,F,R,L			
DIST OF COLUMBIA				R	R	R	R	R
FLORIDA	S	S	S	M	L	L	L	L
GEORGIA	S	S		R	L	R,L		
GUAM								
HAWAII	S	S			S,F,R,L	R		R
IDAHO	S	S	S					
ILLINOIS	S	S	S	L	S,F,R,L	R	F	R
INDIANA	S				S,F,R,L		S,F	
IOWA	S	S	S		R	L	L	R
KANSAS	S		S		R,L	F,R,L	L	F,R,L
KENTUCKY	S	S	S	L	R	L	L	R
LOUISIANA	S				S,R,F,L	L	L	S,F
MAINE				R	R	R		
MARYLAND	S	S	S	R,M	R	R,M	L	R
MASSACHUSETTS	S	S	S	L	R.L	L	L	L
MICHIGAN	S	S	S		R,L	R,L	L	R
MINNESOTA	S	S	S	R	F,R,L	F,R,L	F,L	F,R,L
MISSISSIPPI	S			R,M				
MISSOURI	S	S	S	S	S	S	S	S
MONTANA	S	S	S		R,L	R,L		R,L
NEBRASKA	S	S				F	F	
NEVADA					L	L	L	L
NEW HAMPSHIRE	S							
NEW JERSEY	S	S		M	R,L	R,L	L	L
NEW MEXICO	S							
NEW YORK	S	S		M	F,L	F,L	F,L	F,L
NORTH CAROLINA	S							
NORTH DAKOTA	S		S		F,L	L		F
OHIO	S	S	S	M	F,L	L	F,L	F,L
OKLAHOMA	S	S			S,F	S,F		
OREGON	S							
PENNSYLVANIA	S	S	S	M	F,R	R,L	L	
PUERTO RICO	S	S	S	R	S,F,R,L	S,R	S,F	S,F
RHODE ISLAND	S				R	L		
SOUTH CAROLINA	S	S		R	L	L	L	L
SOUTH DAKOTA	S	S		L	R	R	M	R
TENNESSEE								
TEXAS	S	S	S					
UTAH	S	S	S		R,L	R,L	R,L	R,L
VERMONT	S	S		R	R			
VIRGIN ISLANDS				R,M				
VIRGINIA	S	S		M	S,R,F,L	S,R,L	F,L	L
WASHINGTON	S	S		M	F	F		
WEST VIRGINIA	S	S			S		S	S
WISCONSIN	S	S	S	M	R,L	R,L	R,L	R,L
WYOMING	S	S		S	R	L		

S = State conducts this activity, at least in some areas
R = State regulates this activity, at least in some situations
M = State sets standards for local regulation of this measure
L = Locality initiates and implements this measure
F = State funds this measure (full or cost-share)

Chapter V

ACTIVITIES TO MODIFY THE IMPACT OF FLOODING ON INDIVIDUALS AND THE COMMUNITY

Despite efforts to prevent flooding and reduce the likelihood that it will result in damage, floods do occur. This third strategy is designed to help individuals and communities prepare for, survive, and recover from floods.

Information and Education

Five types of floodplain information and education activities carried out by the states are displayed in Table 16: replying to specific inquiries; publishing manuals, handouts, or similar written materials; conducting training workshops or conferences; issuing press releases; and producing or distributing videotapes. Each column indicates a different recipient of the information.

Almost every state is active in informing and educating local officials about floodplain management, usually those responsible for enforcing the local building codes (see the discussion about providing assistance to local programs in Chapter III). Thirty-nine states maintain a list of the local floodplain management administrators in the state (up slightly from 35 in 1992) and 24 of them make the list available for others' use (up from 20 in 1992) either in a routine distribution or upon request.

Local Public Awareness Campaign

The City of Boulder, Colorado, is always striving to develop new ways of communicating to its citizens the message about the risks inherent to living and working in a floodplain. Its location at the base of the foothills of the Rocky Mountains makes Boulder susceptible to dangerous flash floods that allow as little as 30 minutes warning. In 1994 the City Public Works Department, with a lot of help from other local entities, took advantage of the 100th anniversary of the historic flood of record to raise public awareness of the enduring hazard. The activities of the education campaign included:

- a videotape about flooding
- a new logo for local emergency management
- a traveling exhibit that included historical photographs from the 1894 flood
- press briefings, press releases, interviews, and guest editorials
- a mass mailing to property owners in the floodplain
- paid advertising and feature stories in local periodicals
- new flood education signs along Boulder Creek
- two community-wide symposia on floods
- a new brochure that guides pedestrians along the path of the 1894 flood
- flood education booths at the annual Children's Water Festival and the annual Boulder Creek Festival.

16. State Programs for Floodplain Information and Education

	For Local Officials	For Property Owners & the Public	For Building Contractors	For Insurance Agents & Mortgage Lenders	Public Inquiries about Insurance
ALABAMA	I,T,L	I,N	I,T	I,T	I
ALASKA	I,T,P,L+	I,V,N,P	I,T	I,T	I
ARIZONA	I,T,P,L+	I,V	I,T,P,V	I	I
ARKANSAS	I,T,P,L+	I	I,P	I	I
CALIFORNIA	I,T,P,L+,V	I,T,P	I,P	I,P	I,P
COLORADO	I,T,P,L+	I,T,P,N	I,P	I	I
CONNECTICUT	I,T,P,L	I		I	I
DELAWARE	I,T,L+,V	I,N	I,T,V	I	I
DISTRICT OF COLUMBIA	L	I,N	I,P		I
FLORIDA	I,T,P	I,T,P,N	I,T,P	I	I
GEORGIA	I,T,P,L	I,P	I,T,P	I,T,P	I,P
GUAM					
HAWAII	I,T	I	I,P	I	I
IDAHO	I,T,P,L+	I,N		I	I
ILLINOIS	I,T,P,L	I,P,N	I,T,P	I	I,P
INDIANA	I,T,L,P,V+	I,P,V	I	I,P	I,P
IOWA	I,T	I		I	I
KANSAS	I,T,L+	I	I		I,P
KENTUCKY	I,T,P,L+	I,T,P,N	I,T,P	I	I,P
LOUISIANA	I,T,P,L+	I,P	I,T,P,V		I,P
MAINE	I,T,P,V	I,N	I,T,P	I,T	I
MARYLAND	I,T,P,L	I	I	I	I
MASSACHUSETTS	I,T,P,L+	I,P	I,T	I	I
MICHIGAN	I,T,P,L	I,P,N	I,T,P	I,P,T	I,T,P
MINNESOTA	I,T,P,L	I,P,N	I,T,P	I,T,N	I
MISSISSIPPI	I,T,P	I,P,N	I,T,P,V	I,T,P	I,T
MISSOURI	I,T,P,L	I,T,P			P
MONTANA	I,T,P,L+	I,P,V,N	I,P	I,T	I,P
NEBRASKA	I,T,P,L+	I,P,N	I,T,P,V	I	I
NEVADA	I,L+			I	I
NEW HAMPSHIRE	I,T,P,L	I,P		I,T,P	I,P
NEW JERSEY	I,T	I,T,N		I	I
NEW MEXICO					I
NEW YORK	I,T,P,L	I,N	I	I	I
NORTH CAROLINA	I,T,P	I		I,T	I
NORTH DAKOTA	I,T,P,L+	I		I	I
OHIO	I,T,P,L,V	I,N	I,T,P,V	I	I
OKLAHOMA	I,T,P,L+	N	I	I	I,P
OREGON	I,T				
PENNSYLVANIA	I,T,P,L,V	I,P,V	I,P		I,P
PUERTO RICO		I,T,P	I,T,P	I,T,P	
RHODE ISLAND	I,T,P,L+	I	I,P	I	I
SOUTH CAROLINA	I,T,P,L+	I,T,P,N			I
SOUTH DAKOTA	I,T,L+	I		I	I
TENNESSEE	I,T	I			I
TEXAS	I,T,P,L+	I,P		I,T	I,P
UTAH	I,T,P,L+	I,P,V,N	I,P,V,T	I,T	I
VERMONT	I,T,P	I	I	I	I
VIRGIN ISLANDS			I		I
VIRGINIA	I,T,P	I,T,P,N		I,P	I,P
WASHINGTON	I,T,P,L	I,N		I	I
WEST VIRGINIA	I,L	I		I	I
WISCONSIN	I,T,P,L+,V	P,N	P	I	I
WYOMING	I,L	I,N	I	I	I

I = State provides information in response to inquiries
P = State issues publications or manuals
L = State maintains list of local floodplain administrators
+ = State makes list of local floodplain administrators available to others

T = State holds training workshops or conferences
N = State issues news releases
V = State provides videotapes

The general public and owners of floodprone property (see Table 16, second column) are another large group that receives information from the state. Twenty-five states routinely issue press releases about flood hazards, awareness activities, or similar flood-related issues, the same number that reported that activity in 1992.

Property owners need information about the NFIP, floodproofing, emergency preparedness, and other techniques for protecting themselves from flood loss. Every state responds to direct inquiries from the public, and most states also supply property owners with publications about these topics. This technique not only helps reach a large audience but also avoids the common concern about state liability if specific advice is given directly to a property owner who is later flooded.

Local Flood Information Packet

The City of Harlan, Kentucky, and the Harlan County Conservation District put together a flood awareness package for schools, citizen groups, the media, and other interested people to use. The packet includes an 18-minute videotape and an 18-minute taped slide show, guidelines for showing them to a group, and flood awareness publicity materials. The videotape and slide show were produced in the mountainous rural areas of the county, and show interviews with local residents who describe their personal experiences with flooding. The purpose of the packet is to help citizens understand the importance of using floodplain areas wisely. A grant from the Federal Emergency Management Agency helped fund the project.

Thirty-five states provide information to building contractors (up slightly from 33 in 1992). Thirty-four of those states answer specific questions from builders, 23 distribute publications, 18 offer training workshops, and seven states use FEMA- or state-produced videotapes to help educate building contractors about flooding.

Insurance agents and mortgage lenders also receive information from the states, mostly in response to direct inquiries. Thirteen states conduct training sessions for agents or lenders, up from 10 in 1992, and eight provide them with publications. Virtually all states answer questions from the public about flood insurance, and 15 also distribute manuals or handouts about the NFIP.

Most localities do not actively promote their floodplain management efforts or the NFIP. There are exceptions, however. Some localities have notification programs to let potential property owners know about (and to remind existing residents of) the flood hazard. Of the 900 or so localities that participate in the NFIP Community Rating System, over half (58%) receive credit for some type of public outreach program. Some of them are projects like "flood awareness week," publishing information about the flood hazard in the phone book, enclosing flyers about flooding in utility bills, or mailing notifications directly to all owners or occupants of properties in the community's floodprone areas.

Insurance

Most state flood insurance activities (map assistance, information provision, and education) are discussed above or in the section on the NFIP in Chapter II. Besides providing information about the NFIP, most states promote the purchase of flood insurance. A few help people with claims questions.

17. Flood Emergency and Recovery Activities

	During Emergency Phase*		For Recovery	
	Assist Localities or Special Districts	Assist Federal Agencies	Financial Assistance in State-Declared Disaster	Technical Assistance
ALABAMA	X	X	L,I,B,G,A,M	X
ALASKA	X	X	L,I,G	X
ARIZONA	X	X	L,G,A	X
ARKANSAS	X	X	L,I,B,G,A	X
CALIFORNIA	X	X	L,I,B,G	
COLORADO	X	X	L,A	X
CONNECTICUT	X	X	A,G	X
DELAWARE	X		L,B	X
DISTRICT OF COLUMBIA	X	X	I,B,A	X
FLORIDA	X	X	L,I,B,G,M	X
GEORGIA	X		L,A	X
GUAM				
HAWAII	X	X	L,I,B,G,A,M	X
IDAHO	X	X		X
ILLINOIS	X			
INDIANA	X	X		X
IOWA	X	X	L,I,G,A	X
KANSAS	X	X	L,G,A	X
KENTUCKY	X	X	L,M	X
LOUISIANA	X	X		X
MAINE	X	X	L,I,B,G,A	X
MARYLAND	X		L,G	X
MASSACHUSETTS	X	X	L,G,B,I,A	X
MICHIGAN	X	X	L,I,A,B	X
MINNESOTA	X	X	L,A,M	X
MISSISSIPPI	X	X	I,A	X
MISSOURI	X	X	L,M	X
MONTANA	X	X	L,G	X
NEBRASKA	X		G,M	X
NEVADA	X		L,I,B,G	X
NEW HAMPSHIRE	X	X		X
NEW JERSEY	X	X	L,G	X
NEW MEXICO				
NEW YORK	X			X
NORTH CAROLINA				
NORTH DAKOTA	X		L,I,A	X
OHIO	X	X	L,M	X
OKLAHOMA	X	X	L,M	X
OREGON				
PENNSYLVANIA			L	X
PUERTO RICO	X	X	L,I,B,G	X
RHODE ISLAND	X	X	L,I,B,G	X
SOUTH CAROLINA	X	X		X
SOUTH DAKOTA	X	X	L,G,M	X
TENNESSEE				
TEXAS	X	X	L,G,M	X
UTAH	X	X	L,G,A	X
VERMONT	X	X	L,G,A	X
VIRGIN ISLANDS		X	A	X
VIRGINIA	X		L,G	X
WASHINGTON	X		L,I,B,G,A,M	X
WEST VIRGINIA	X		L,I,G,A,M	X
WISCONSIN	X	X	L,A	X
WYOMING	X			X

*Includes all types of assistance
X = State provides this service
L = From state to local governments
I = From state to individuals
B = From state to businesses
G = Funds from governor's emergency fund
A = Funds from special state appropriations
M = Funds from other state sources

Tax Adjustments

In nine states (California, Florida, Georgia, Michigan, Montana, Pennsylvania, South Carolina, Virginia, and Washington), land that is kept undeveloped or is donated to a public agency is eligible for property, income, or inheritance tax adjustments. Although some open floodplain areas have been created partly as a result of the existence of those programs, none of the tax provisions mentioned was designed with that end in mind. These measures are described more fully in the section on using tax adjustments to restore or preserve the natural resources of floodplains in Chapter VI.

Emergency Measures

Virtually all states assist localities and special districts during flood emergencies (Table 17). The assistance comes from different state agencies and takes dozens of different forms, including repairing roads and bridges; providing food, temporary housing, and communications; issuing warnings; flood fighting; loaning equipment such as boats, trucks, and pumps; predicting flood elevations; helping with evacuation and cleanup; and conducting preliminary damage assessments.

Thirty-six states (up from 27 in 1992) work with federal agencies during Presidentially declared disasters. Usually the state provides personnel for and helps manage the Disaster Application Centers and helps conduct disaster assistance surveys.

Postflood Recovery

All states contribute some of the nonfederal share of assistance for Presidentially declared disasters. Forty-one states also provide financial assistance, usually out of a governor's emergency fund, in a state-declared disaster (compared to 38 in 1992 and 28 in 1988). Sometimes special appropriations are made for the financial assistance. In most cases the funds go to local governments, but in some states loans, grants, or other forms of relief are available for individuals and businesses (Table 17).

Practically all states provide technical assistance to localities, businesses, and individuals in the postdisaster period. This help comes in the form of handouts, manuals, workshops, on-the-spot assistance, training, and advice. Several states actively help localities obtain federal funding for restoration efforts.

Chapter VI

ACTIVITIES TO RESTORE AND PRESERVE THE NATURAL RESOURCES AND FUNCTIONS OF FLOODPLAINS

Preserving and restoring the natural resources and functions of floodplains is the fourth key strategy of *A Unified National Program for Floodplain Management 1994*. These resources include water resources, biologic resources, and societal resources. In the past, most state and local floodplain management programs were designed principally to protect property and public health and safety. In the last few years, however, there has been a growing awareness of and understanding that the key social, economic, natural, and other processes within a geographic area—a watershed, for instance—are closely interrelated. Consequently, activities that further this strategy are more frequently becoming integrated into larger, often region-wide, efforts to manage growth, improve economic conditions, maintain environmental quality, and handle other issues of importance to local residents. Many of the activities to restore and preserve the natural attributes of floodplains have been the result of cooperative programs or projects that involve several state or local agencies and/or other governmental and private entities.

Local governments are often the key to these types of projects, because of the localized benefits that accrue. This section describes first, some cooperative efforts undertaken by states to protect floodplain resources; second, some locally initiated projects; third, ways in which each of the tools for the strategy of restoring and preserving the natural resources of floodplains is used at the state level; and finally, estimates by state floodplain managers of the status of the floodplain resources in their states.

State Projects

Some types of resource protection projects in which states have been involved are listed in Table 18. These "cooperative projects" take many forms, from providing technical assistance about floodplain management to full-scale funding and implementation.

The most popular has been multi-objective management of watersheds or river corridors, a process by which the functions, resources, and benefits of rivers and streams are managed as whole systems. The states promote multi-objective planning and management in a variety of ways: through ongoing technical assistance and other programs, by including it in training

18. Cooperative Projects to Protect Floodplain Resources

	MOM* of Watersheds	Forestry	Wetlands	Fish & Wildlife	Water Quality	Other
ALABAMA	X	X	X	X	X	
ALASKA	X			X	X	
ARIZONA	X			X	X	
ARKANSAS	X				X	
CALIFORNIA	X		X	X	X	
COLORADO	X		X	X		X
CONNECTICUT	X		X	X	X	X
DELAWARE						
DISTRICT OF COLUMBIA						
FLORIDA	X		X		X	
GEORGIA	X	X	X	X	X	
GUAM						
HAWAII						
IDAHO						
ILLINOIS						
INDIANA			X	X		
IOWA	X					
KANSAS			X			
KENTUCKY	X		X	X	X	
LOUISIANA	X			X	X	
MAINE	X					
MARYLAND		X	X	X	X	
MASSACHUSETTS	X		X			X
MICHIGAN	X	X	X	X	X	X
MINNESOTA	X	X	X	X	X	X
MISSISSIPPI	X		X			
MISSOURI	X		X	X		
MONTANA	X	X	X	X	X	
NEBRASKA						
NEVADA						
NEW HAMPSHIRE	X					
NEW JERSEY	X		X	X	X	
NEW MEXICO						
NEW YORK						
NORTH CAROLINA						
NORTH DAKOTA			X			
OHIO	X	X	X	X	X	X
OKLAHOMA	X		X			X
OREGON						
PENNSYLVANIA	X		X		X	
PUERTO RICO						
RHODE ISLAND						
SOUTH CAROLINA	X		X	X	X	
SOUTH DAKOTA	X					
TENNESSEE	X					
TEXAS	X		X	X	X	X
UTAH	X	X	X	X	X	X
VERMONT						
VIRGIN ISLANDS						
VIRGINIA	X					
WASHINGTON	X					
WEST VIRGINIA						
WISCONSIN	X				X	X
WYOMING						

* Multi-objective management

X = State floodplain management agency works with other state, local, regional, or federal agencies or other entities on this kind of project

workshops, by describing opportunities and/or successful initiatives in regular newsletters, by suggesting the technique during post-flood hazard mitigation planning, and by providing funding. Multi-objective watershed management is supported by federal agencies including the U.S. Environmental Protection Agency, the Federal Emergency Management Agency, and the National Park Service. The federal government's involvement—bringing technical expertise of many kinds and often accompanying funding—has in many cases helped make state support of such efforts more feasible. Thirty-two states participated in multi-objective management in the last three years, up from 22 in 1992. Some recent (and ongoing) projects include the Kenai River Corridor project in Alaska, the Merrimack River Initiative in Massachusetts and New Hampshire, the Edisto River Basin Project in South Carolina, the San Miguel Basin plan in Colorado, the Trinity River Corridor Interjurisdictional Management Program in Texas, and the Vermillion River Basin plan in South Dakota.

Multi-objective Management

The Upper Trinity River encompasses 240 square miles of floodplain land in the Dallas-Fort Worth metropolitan area; it flows through the political jurisdictions of nine cities, three counties, and numerous special districts. Over the last several years local citizens, federal, state, and city government officials and staff, business people, interest groups, and other have come to realize that the river corridor holds valuable community assets like wetlands, fish and other wildlife habitats, historic sites, and recreational opportunities. By forming partnerships among themselves and involving everyone with a stake in the river's future, they have developed a consensus vision for a "world class" Trinity River Corridor Greenway that will be combining flood reduction measures (structural and nonstructural), parks, nature centers, environmental research facilities, off-road trails, wetlands, integrated transportation corridors, and restoration of environmental quality. Their Citizens' Committee involved 400 people of varied ethnic and economic backgrounds, interests, talents, and professions in an eight-month-long planning process to develop policies and plans for the greenway. Funding and cost-sharing arrangements among private and public entities, along with a city bond issue, will make its implementation possible.

The next most popular activity, with 24 states participating (up from 13 in 1992), is protecting and/or restoring wetlands. The number of states that have cooperated with other public or private entities to help protect forests, fish and wildlife, water quality, and other floodplain resources also increased in the last three years (see Table 18). For example, to help protect wildlife, Colorado mapped the 100-year floodplain on certain stream reaches to define critical habitat for four species of endangered fish.

Local Projects

There have been numerous locally initiated projects to restore and preserve the natural resources of floodplains. The motivation for such programs has been the locality's desire to reduce future flood losses, restrict development, retain the natural character of the landscape, improve habitat, enhance recreation, provide a sustainable economic boost to the area, manage other attributes perceived as valuable by the local residents, or a combination of these. In many instances the need for open space or a park was combined with a desire to eliminate a chronic flooding problem. Often a damaging flood provided the impetus (and some federal and/or state funding) to get the project going.

- Limon, Colorado, created some wetlands and started a wetlands banking program as part of a flood mitigation project. The wetland storage will help reduce the size of the town's floodplain area.

- In California, the Elk Grove School District and the Dillard Elementary School Parent-Teacher Association did some channel restoration and revegetation on Badger Slough in Sacramento County. The project relieved channel maintenance problems and alleviated downstream flooding, as well as involving students and neighborhood residents.

- The John Muir Creek Task Force in Alameda County, California, opened up for safe access a short reach of a creek adjacent to a school. Natural vegetation was restored, and the floodplain was expanded to reduce the velocity of the flow and minimize erosion. Pedestrian paths were included.

- Some Virginia communities have passed "no-build" ordinances, limiting building density in certain areas, sometimes including floodplains.

- Several Utah localities, including Salt Lake County, Weber County, Ogden City, South Ogden City, and St. George, have developed river corridor parkways or conservation zones, restricting building in the floodplains and encouraging open space, sometimes for recreation. Similar efforts have occurred in South Carolina, New Hampshire, Kentucky, and Virginia.

- Breckenridge, Colorado, did the Blue River Reclamation project as mitigation for a golf course that was constructed partly in wetlands.

- Indian Bend Wash in Scottsdale, Arizona, was channelized and recreation areas were included in the new design.

- The City and Borough of Juneau and Anchorage, Alaska, have developed greenbelts along the their floodplains.

- Newark and New Castle, Delaware, did open space preservation projects in their floodplains to improve the quality of the recreational opportunities there.

Tools used at the State and Local Levels to Preserve and Restore the Natural Resources and Functions of Floodplains

Regulations

Regulations are one of the most widely used ways in which states and localities protect the natural resources and functions of floodplains (Table 19).

19. Regulatory Approaches for the Natural Resources of Floodplains

	Permit Review	Wetlands	Habitat	Open Space	Other Resources
ALABAMA	X	A,S	M	M	
ALASKA	X	A,L	M		
ARIZONA	X	S	S		
ARKANSAS	X	F			
CALIFORNIA	X	M	S		
COLORADO	X	L	L		
CONNECTICUT	X	A,S, +,L	M	M	
DELAWARE		+		M	S
DISTRICT OF COLUMBIA	X	S			
FLORIDA	X	S,L	S	S	S
GEORGIA		A			
GUAM					
HAWAII	X	S			S
IDAHO					
ILLINOIS	X				S
INDIANA	X	A,M	M		
IOWA	X		S		
KANSAS	X	F			
KENTUCKY	X	S			S
LOUISIANA	X		S	S	S
MAINE	X	S	M	M	S
MARYLAND	X	A,S,L	M	M	
MASSACHUSETTS	X	S,L	M	M	S
MICHIGAN	X	S	S	S	
MINNESOTA	X	S	M	M	S
MISSISSIPPI	X	A,S	M	M	
MISSOURI		M	M	M	
MONTANA	X	F,L	L	M	
NEBRASKA	X	A,L	M		
NEVADA	X	I	I		
NEW HAMPSHIRE		S	M	M	
NEW JERSEY	X	S	M	M	S
NEW MEXICO					
NEW YORK		S			
NORTH CAROLINA		A,S			
NORTH DAKOTA		A,S			
OHIO		I,M	I,M	I	
OKLAHOMA	X	A,S			
OREGON		L			
PENNSYLVANIA	X	S,I			S
PUERTO RICO	X	S	S	S	
RHODE ISLAND		S			
SOUTH CAROLINA					
SOUTH DAKOTA	X	M	M	I	M
TENNESSEE					
TEXAS	X	S	I	I	
UTAH	X	M	M	M	
VERMONT		S			
VIRGIN ISLANDS	X	F			
VIRGINIA	X	A,S	L		L
WASHINGTON	X	L			
WEST VIRGINIA	X				
WISCONSIN	X	L	M	M	
WYOMING	X	A			

X = State conducts this activity, at least in certain areas
S = State directly regulates development affecting this floodplain resource
A = Rules apply only in certain areas
L = Local regulations affecting this floodplain resource must meet state requirements
+ = State will directly regulate activities affecting this floodplain resource if localities do not
F = State regulates to federal standards
I = Regulation is at local initiative
M = A mix of federal, state, regional, or local standards governs activities affecting this floodplain resource

Wetlands are the most commonly regulated floodplain resource. Forty-five states have some regulatory controls for wetlands in place, either at the state or local level. Over half the states have regulations to protect floodplain habitat; over one-third regulate to provide floodplain open space. Some states have regulations to protect other floodplain resources or features, like dunes, barriers, bluffs, beaches, aquifer recharge areas, and wild and scenic rivers.

Thirty-eight states use their permit review processes to examine the natural qualities of the floodplain that would be affected by proposed projects. In those states, either the floodplain management agency reviews the proposed development itself, or it circulates the permit requests to other appropriate agencies. Every regulatory approach listed in Table 19 is used by more states now than it was in 1992.

Development and Redevelopment Policies

Table 20 shows some of the principal state programs for protecting floodplain resources. Each state's program is different, consisting of whatever techniques are most appropriate. Activities may be directed toward a particular resource, such as habitat for an endangered species, or natural protective features like dunes and beaches. The techniques employed may range from regulation of development that could affect the resource, to formal or informal policies that promote protection without actually requiring it, to funding public purchase of land in order to fully preserve the resource.

The most widely used program is that of natural heritage protection (for threatened and endangered species), with 44 states having such a program (up from 37 in 1992). Next come wetland management programs, with 41 state programs reported (up from 33). Thirty-five states have wild and scenic rivers programs (up from 30); 27 have programs for watershed management (up from 22); 19 have lakeshore protection programs (up from 14); and 27 have coastal zone management programs (up from 24). Ten states have ongoing programs for improving public awareness of floodplain resources, and 8 states have acquisition programs targeted toward maintaining floodplain open space or habitat (both new categories this year).

However, last year the North Dakota legislature repealed the law authorizing the state's wetlands mitigation bank. The Wisconsin legislature rescinded funding for the state's dam removal program, which allowed the state to demolish abandoned dams, which not only can pose a hazard but also interfere with natural waterway functions like navigation or recreation.

Another technique used by some states to protect floodplain resources and/or minimize floodplain development is a formal growth management policy. Fifteen states have such policies (Connecticut, Delaware, Florida, Hawaii, Kentucky, Maine, Maryland, Minnesota, Missouri, New Jersey, Ohio, Rhode Island, South Dakota, Tennessee, and Washington). Growth management takes various forms.

- Minnesota's shoreland program mandates land use districting in coastal areas and a comprehensive plan for the entire lakeshore or river reach.

- New Jersey has adopted a statewide master development plan that provides some protection to floodplains; Delaware has a similar process.

20. State Programs Affecting the Natural Resources of Floodplains

	Wetlands Mngmnt.	Natural Heritage Protection*	Wild & Scenic Rivers	Watershed Mngmnt	Lakeshore Mngmnt.	Coastal Zone Management	Acquisition for Habitat, Public Use, etc.	Public Awareness & Education
ALABAMA		X				X	X	X
ALASKA	X	X	X	X		X		
ARIZONA	X	X		X				
ARKANSAS		X	X					
CALIFORNIA	X	X	X	X		X		
COLORADO	X	X						
CONNECTICUT	X	X	X		X	X	X	X
DELAWARE	X		X	X		X		
DIST OF COLUMBIA	X	X	X					
FLORIDA	X	X	X	X	X	X	X	
GEORGIA	X	X	X	X		X		
GUAM								
HAWAII	X	X	X			X		
IDAHO			X	X	X			
ILLINOIS	X	X	X	X	X		X	
INDIANA	X	X	X					
IOWA		X						
KANSAS		X						
KENTUCKY	X	X	X	X	X			X
LOUISIANA	X	X	X			X		
MAINE	X	X	X	X	X	X		
MARYLAND	X	X	X	X		X		
MASSACHUSETTS	X	X	X	X	X	X		
MICHIGAN	X	X	X	X	X	X		X
MINNESOTA	X	X	X	X	X		X	X
MISSISSIPPI	X	X				X	X	X
MISSOURI	X	X		X			X	
MONTANA	X	X	X	X				X
NEBRASKA	X	X		X	X			
NEVADA	X	X	X	X	X			
NEW HAMPSHIRE		X	X	X		X		
NEW JERSEY	X	X	X	X		X	X	
NEW MEXICO								
NEW YORK	X	X	X			X		
NORTH CAROLINA								
NORTH DAKOTA	X		X					
OHIO	X	X	X	X	X	X		X
OKLAHOMA	X	X	X	X	X			X
OREGON								
PENNSYLVANIA	X	X	X			X		
PUERTO RICO	X	X	X		X	X		
RHODE ISLAND	X	X				X		
SOUTH CAROLINA	X	X	X	X	X	X		X
SOUTH DAKOTA	X	X	X	X	X			
TENNESSEE								
TEXAS		X				X		
UTAH	X	X						
VERMONT	X	X						
VIRGIN ISLANDS	X	X				X		
VIRGINIA	X	X	X	X		X		
WASHINGTON	X		X	X	X	X		
WEST VIRGINIA								
WISCONSIN	X	X	X	X	X	X		
WYOMING	X	X	X					

*Threatened and endangered species programs
X = State has its own program for this type of resource management

- Florida, Maine, Maryland, Rhode Island, and Washington require localities to incorporate floodplain protection into their local comprehensive plans; Maryland identifies floodplains as "special sensitive areas."

- Hawaii uses case-by-case development permit approvals.

- Ohio's policy is to encourage a balance between the need for development and the functions and values of resources, including those on floodplains.

- The Rhode Island State Planning office has designated over 400 miles of natural corridors that follow the state's major river systems, coastal barriers, major islands, and agricultural belts; floodplains were one of six criteria for inclusion of lands within this protected zone.

Information and Education

State efforts to inform and educate the general public and interested professionals about the natural resources of floodplains are generally included with other floodplain management education efforts or in the information campaigns of state agencies whose prime mission is protecting a particular resource that happens to occur in floodplains. As shown in Table 20, however, 10 states focus specifically on the natural resources of floodplains.

Tax Adjustments

Provisions in state and/or local tax codes that allow breaks on property, inheritance, or income taxes for leaving land undeveloped or for donating it for public use can help preserve floodplain resources. Such relief is available in nine states: California, Florida, Georgia, Michigan, Montana, Pennsylvania, South Carolina, Virginia, and Washington. In both Virginia and South Carolina, the tax breaks are available only through existing open space, easement, or other natural resources programs. In Washington, localities offer property tax reductions for certain undeveloped lands. Existing laws do not always work as envisioned, however. California's Williams Act for Agricultural Land reduces taxes if a parcel's zoning designation stays agricultural, but the 2% annual ceiling on assessment increases imposed by Proposition 13 has kept taxes on open lands relatively low, so there is no real incentive for people to donate land for open space preserves.

Administrative Measures

In addition to the regulatory approaches shown in Table 19, two administrative techniques are used by states to preserve or protect the natural resources of floodplains: (1) executive orders and (2) procedures for coordinating the functions of the various agencies that deal with specific resources.

Five states (California, Connecticut, Illinois, Ohio, and Utah) have special governor's executive orders that govern activities in wetlands (see Table 10). Other states

use executive orders to protect other floodplain resources: Connecticut has one governing coastal areas, and Massachusetts' 1980 order gives barrier beaches priority status for certain programs and limits coastal engineering structures and development on them.

In any given state, programs for protecting different floodplain resources may be housed in separate agencies. For example, state wetlands management programs are usually in a department for natural resources or environmental quality, but in some states they are under a water commission or an agency for marine resources. State programs to protect rare and endangered species are found in departments for environmental conservation or quality, under the fish and wildlife department, within a biological survey at a state university, in parks and recreation, or even under a department for economic and community development. This situation makes intrastate coordination of these programs vital.

Executive Order on Wetlands

California's 1993 executive order (W-59-93) establishes the California Wetlands Conservation Policy, which recognizes the importance of wetlands in storing flood waters and many other functions. It outlines 15 actions that state agencies are to take with regard to wetlands, including mitigation banking, inventories, education, planning, regulation, providing landowner incentives, and others. It directs the establishment of a task force to coordinate and implement the policy and coordinate among all federal, state, local, and private entities involved.

Table 21 lists the states that have mechanisms to ensure effective coordination of these resource management programs. The first two columns show that 30 states (up from 26 in 1992) have a formalized procedure for coordinating the management of natural resources, including floodplains—a written policy, plan, or supporting documents and/or an oversight board or committee responsible for coordination and for resolving conflicts.

A second mechanism is the routine, sometimes informal, coordination carried out by state floodplain management personnel to make sure that their activities, policies, and regulations are compatible with those of other federal, state, regional, or local agencies. In some states, this coordination takes the form of mutual review of permits, proposed actions, and other documents; in others, floodplain management personnel contact or are contacted by other state personnel on an *ad hoc* basis when a specific resource is involved or a concern is raised. The last five columns of Table 21 show the 35 state floodplain management offices that routinely coordinate with at least some other agencies responsible for resources that may occur in floodplains. Twenty-nine state floodplain management offices coordinate with wetlands agencies, 27 with fish and wildlife agencies, 25 with a water quality office, 23 with a natural resources agency, and 10 with forestry agencies. All of these categories of coordination showed an increase since 1992.

Status of Floodplain Resources

The state personnel surveyed for this report were asked to assess the status of the quantity and quality of certain floodplain resources within their states. Because no states maintain quantitative data on these resources, respondents were simply asked whether, in their professional judgement, certain floodplain resources were "quickly being lost," "being lost," "holding steady," "being restored," or "quickly being restored." For example, as shown in Table 22, two states think that their inland wetlands are being quickly restored. No states thought that any of their floodplain resources were being lost

21. State Coordination of Natural Resource Management Programs

	Intrastate Coordination		Floodplain Management Office Coordination				
	Written Plan	Coordinating Committee	Forestry	Natural Resources	Wetlands	Fish & Wildlife	Water Quality
ALABAMA			C	C	C	C	C
ALASKA		X		C	C		C
ARIZONA		X		C	C	C	C
ARKANSAS	X	X		C	C	C	C
CALIFORNIA		X					
COLORADO		X			C	C	C
CONNECTICUT	X	X		C	C	C	C
DELAWARE							
DISTRICT OF COLUMBIA			C		C		C
FLORIDA	X	X					
GEORGIA	X	X	C	C	C	C	C
GUAM							
HAWAII							
IDAHO	X	X			C	C	C
ILLINOIS							
INDIANA					C	C	
IOWA						C	C
KANSAS			C			C	C
KENTUCKY				C	C	C	C
LOUISIANA		X					
MAINE	X	X					
MARYLAND	X				C	C	
MASSACHUSETTS		X		C	C		
MICHIGAN	X	X	C	C	C	C	C
MINNESOTA			C	C	C	C	C
MISSISSIPPI					C		C
MISSOURI	X	X	C	C			
MONTANA	X	X		C	C	C	C
NEBRASKA	X	X				C	
NEVADA							
NEW HAMPSHIRE					C		
NEW JERSEY	X		C	C	C	C	C
NEW MEXICO							
NEW YORK	X	X					C
NORTH CAROLINA							
NORTH DAKOTA		X					
OHIO				C	C	C	C
OKLAHOMA	X	X		C		C	
OREGON							
PENNSYLVANIA	X	X	C	C	C	C	C
PUERTO RICO	X			C	C	C	
RHODE ISLAND							
SOUTH CAROLINA	X	X	C	C	C	C	C
SOUTH DAKOTA							
TENNESSEE							
TEXAS	X	X					
UTAH	X	X	C	C	C	C	C
VERMONT	X				C		
VIRGIN ISLANDS	X	X		C	C	C	C
VIRGINIA	X	X		C	C	C	
WASHINGTON				C	C	C	C
WEST VIRGINIA							
WISCONSIN		X		C	C	C	C
WYOMING							

X = State uses this tool to coordinate natural resource management activities among different agencies within the state

C = The state floodplain management office routinely coordinates its activities with a local, state, federal, or other office responsible for this resource

at a rapid rate. Taken as a whole, the responses indicate that, in general, floodplain resources are holding their own against the various pressures that can contribute to their deterioration. If any change can be discerned from 1992 to today, it is a slight trend toward the "holding steady" category, that is, floodplain resources are not being lost as quickly as before, but they are not being restored as quickly, either. In 1992, 48% of the responses (all states, all resources) fell into the "holding steady" category; in 1995, 57% did. In 1992, 25% of the states surveyed thought at least one resource was quickly being lost; today, only 23% think so. In 1992, 26% thought that at least one resource was being restored quickly; today, only 20% think so. A resource-by-resource breakdown of the responses follows the same pattern.

22. Status of the Quality and Quantity of Floodplain Resources

FLOODPLAIN RESOURCE	Quickly Being Lost		Being Lost		Holding Steady		Being Restored		Quickly Being Restored	
	1992	1995	1992	1995	1992	1995	1992	1995	1992	1995
AQUATIC HABITAT			**********	*******	**********	**********	*******	*****		*
RIPARIAN HABITAT	*		**********	**********	**********	**********	**********	*****		*
RIVERINE ACCESS	*		****	*******	**********	**********	**********	******	**	
RECREATION OPPORTUNITIES			***	*	**********	**********	**********	**********	**	
OPEN SPACE	*		**********	*******	**********	**********	****	*****	*	*
INLAND WETLANDS	*		**********	**********	**********	**********	*******	**		**
COASTAL WETLANDS	*		*******	*******	*******	*******	****	***		
COASTAL ACCESS	*		**	*******	**********	**********	****	****	*	*
COASTAL HABITAT	*		*******	*******	**********	**********	*	***		

* = One state respondent estimates this status for the quality and quantity of this floodplain resource

Chapter VII

CONCLUSION

The information presented in this report shows, above all, that every state or local floodplain management program is unique: each varies according to numerous factors, including the financial status of the state government and the condition of the regional economy, the types of flooding common to the area, the political situation, prevailing attitudes toward regulation and resource preservation, the extent of financial and other support available, and many others. Two or more states may have taken the same approach to a floodplain problem but for entirely different reasons and with different results. At the same time, it should be remembered that states and localities also vary widely in their susceptibility to flood risk. A densely populated area with heavy annual precipitation and an extensive network of waterways obviously has a more challenging floodplain management problem than does an arid region with little development pressure.

Keeping this diversity in mind, this final chapter pulls together an overall picture of state and local floodplain management today. First, the principal changes and developments noted over the past three years are summarized. The chapter then concludes with a broad assessment of the status of the field.

Summary of the Past Three Years

Our knowledge about state and local floodplain management can be roughly divided into three categories. First, there is information about the fundamental components of state and local programs: financial and other support, legal authority under which they operate, and their organizational frameworks. The second category includes the specific floodplain management activities that states and localities undertake to cope with their flood risk and try to protect their floodplain resources. The third category consists of external factors that influence the practice of floodplain management.

Changes in the Fundamental Components of State and Local Floodplain Management

The ease or difficulty with which states and localities carry out the activities obviously depends upon the quality of the underlying components of their programs. The important changes in these components over the past three years are summarized below.

Changes in Financial and Other Support Table 23 shows the difference in state support for floodplain management between 1992 and the present. To compare the funding levels over time, an analysis was made for only the 31 states for which budget figures were reported in both 1992 and 1995. Through its CAP, FEMA is providing a little over $3.4 million (compared to $3 million in 1992) to 36 participating states. CAP funding stayed at the same level or increased in 23 states; only 6 states are receiving less CAP funding now than three years ago. Thus, CAP funding is up 7% from 1992. The funding provided by the states themselves, however, has diminished. In about half the states, the state funding level is higher than in 1992, and in the other half it is lower. However, the increases tended to be slight while the cuts tended to be dramatic. Both New Jersey and Minnesota reported large shifts in the amount of funding available. New Jersey's 1995 figures are up almost $14 million, the result of including some structural flood control within the floodplain management budget. Minnesota's overall budget is down almost $2 million due to the absence of the mitigation funds that were available in 1992. When these two anomalous figures are omitted from the analysis, the data show that state funds (columns 3 and 4) are down 15% from 1992 levels and that overall budgets for state-level activities (the last two columns) are down 12%. It is important to note that *these figures are not adjusted for inflation.*

The states reported an estimated 245 FTEs working at state-level floodplain management today.[4]

Changes in Legal Authority Although some states have newly strengthened laws and policies pertaining to floodplain management (disclosure, funding mechanisms, and growth management) in others floodplain management regulations have been weakened and private property rights have been statutorily strengthened over the past three years. Proposals for new takings laws (to limit governmental restrictions on property) are still on the table in some states.

Changes in Organizational Frameworks During the past three years, 10 states reported governmental reorganizations, and eight of those have been detrimental to the state floodplain management program. The impacts of the changes in the other two states are not yet clear. In addition, shifts of key personnel away from floodplain management have been reported in a few cases, and since the information was gathered for this report at least two other states have undergone some reorganization.

[4] In 1992, 177 FTEs were reported, and 200 in an earlier, 1981, assessment. These figures are not strictly comparable, however, because of differing descriptions of floodplain management personnel from year to year and among states. In 1981, floodplain management personnel were considered by some states to be those "involved" with floodplain management; the 1991 survey asked for the number of staff persons "specifically dedicated" to floodplain management—a much narrower category. In 1994, we requested simply the number of FTE (full-time equivalent) floodplain management staff persons, so that part-time and occasional floodplain management support would be included in the total.

23. Staffs and Budgets of State Floodplain Management Programs, 1992 and 1995

	Floodplain Mngmnt. Staff		Floodplain Management Budget							
	No. of FTEs		State Funds		FEMA Funds		Other Funds		Total Budget	
	1995	1992	1995	1992	1995	1992	1995	1992	1995	1992
ALABAMA	3	2	$ 22,557	$ 30,000	$ 67,670	$ 65,000		$ 0	$ 90,227	$ 95,000
ALASKA	1	1	30,000	–	50,000	–			80,000	–
ARIZONA	3.5	2.5	50,000	60,000	83,000	92,000	$ 50,000[j]	0	183,000	152,000
ARKANSAS	3	1	32,000	21,334	96,000	64,000		0	128,000	85,334
CALIFORNIA	9	–	691,000	–	240,000	–			931,000	–
COLORADO	3	3	200,000	150,000	78,838	50,000		0	278,838	200,000
CONNCTCUT	5	–	141,000	–	136,000	–			277,000	–
DELAWARE	2.4	5	17,000	250,000	50,000	40,000	9,200[k]	10,000	76,200	300,000
D COLMBIA	–	1	-	25,000	–	–			–	25,000
FLORIDA	6	4	-	63,999	–	183,000		0	–	246,999
GEORGIA	2	2	27,000	28,000	80,000	84,000		0	107,000	112,000
GUAM		–	–	–	–	–			–	–
HAWAII	0.5	3+	0	145,000	60,000	37,000		172,000[a]	60,000	354,000
IDAHO	1.2	1	21,790	19,333	65,369	58,000		0	87,159	77,333
ILLINOIS	16	22	725,000	–	130,000	150,000		0	855,000	>150,000
INDIANA	48	8	2,298,080	–	90,139	–	300,000[l]		2,688,219	–
IOWA	5.25	5.5	320,000	300,000	0	0		0	320,000	300,000
KANSAS	–	4+	–	588,000	–	64,000		117,000[b]	–	769,000
KENTUCKY	25	7+	1,100,000	950,000	85,000	84,000		0	1,185,000	1,034,000
LOUISIANA	4	5.5	–	44,120	–	132,358		0	–	176,478
MAINE	2.5	2+	39,000	31,675	117,000	95,023		~10,000[c]	156,000	136,698
MARYLAND	16	5+	875,000	–	67,000	70,000		?[d]	942,000	>70,000
MASSCHSTS	3	3	50,000	17,300	150,000	130,000		0	200,000	147,300
MICHIGAN	16	15.5	618,200	546,800	150,000	140,600	316,200[e]	170,000[e]	1,084,400	857,400
MINNESOTA	7.5	4+	405,400	615,000	86,000	85,000		1,700,000[f]	491,400	2,400,000
MISSISSIPPI	1	1	–	20,646	–	61,939			–	82,585
MISSOURI	1	–	32,000	–	79,000	–			111,000	–
MONTANA	1.25	2	5,000	50,000	57,000	50,000			62,000	100,000
NEBRASKA	2.5	3	109,400	97,000	0	60,000			109,400	157,000
NEVADA	–	1	–	16,000	–	48,841			–	64,841
N HMPSHIRE	2	–	20,000	–	60,000	–			80,000	–
N JERSEY	5	4	14,000,000	97,000	121,000	141,000		308,000[g]	14,121,000	546,000
N MEXICO	–	–	–	–	–	–			–	–
NEW YORK	6	12	278,700	620,000	185,700	160,000		0	464,400	780,000
N CAROLINA	–	–	–	–	–	–			–	–
N DAKOTA	2.5	2.5	52,000	30,000	68,000	60,000			120,000	90,000
OHIO	8	4	155,000	80,000	150,000	110,000		0	305,000	190,000
OKLAHOMA	1	1	28,000	30,741	110,000	92,223	15,000[h]		153,000	122,964
OREGON	–	–	–	–	–	–			–	–
PENNSYLVN	–	3	0	200,000	55,000	60,000			55,000	260,000
P RICO	–	1.5	–	–	–	–			–	–
R ISLAND	0.5	–	6,600	26,600	19,800	19,300			26,400	45,900
S CAROLINA	3.25	1	–	16,790	–	45,200			–	61,990
S DAKOTA	0.25	0	0	0	0				0	0
TENNESSEE	–	–	15,000	–	50,000	–			65,000	–
TEXAS	3	3	50,000	54,000	150,000	162,000		0	200,000	216,000
UTAH	1	2	0	20,000	65,000	60,000			65,000	80,000
VERMONT	1	1	20,000	20,000	60,000	55,000			80,000	75,000
V ISLANDS	–	0	–	–	–	–			–	–
VIRGINIA	3	4	60,000	200,000	100,000	100,000	30,000[h]	20,000[h]	190,000	320,000
WASHNGTN	6	7	2,100,000[i]	2,100,000[i]	100,000	90,000			2,200,000	2,190,000
W VIRGINIA	–	0	–	0	–	0			–	0
WISCONSIN	14	17	700,000	1,000,000	108,000	108,000			808,000	1,108,000
WYOMING	0.25	0	0	0	0	0			0	0

[a]dam safety
[b]Transportation Department exchange
[c]state funding to Regional Councils
[d]special contracts
[e]transportation funding
[f]flood hazard mitigation activities
[g]Flood Control Bond Act
[h]miscellaneous sources, grants, etc.
[i]includes local grants for flood damage reduction
[j]flood control planning
[k]General Fund and Bond Bill
[l]flood control projects mapping

+ = additional personnel have limited or related responsibilities
– = data not available

Changes in State and Local Activities

Information about state activities collected in 1981, 1988, 1991, and 1994 shows that the range of floodplain management activities that states are undertaking is becoming wider and also that, in general, more states are participating in each of them.[5]

In addition to the NFIP activities and those for natural resources described below, five kinds of activities showed notable increases in participation in the last three years: state regulation of the construction of dams, participation in multi-objective management projects, state acquisition and relocation programs, working with federal agencies after a disaster, and providing financial assistance to localities in state disasters. The increases in the last three activities are probably a result of the widespread flooding in the Midwest and elsewhere during 1993 and 1994.

NFIP Support Between 1981 and 1988, there had been a dramatic increase in the number of states undertaking activities in support of the NFIP (see Table 4), doubtless because of the introduction of FEMA's programs to fund measures to help increase local capabilities in participating states.[6] Although the number of NFIP support activities increased in the last six years as well, it has been a much smaller increase, because most states are now participating in almost as many activities as possible.

Natural Resources The biggest increase in level of activity has been in restoring and preserving the natural resources of floodplains. The number of states restoring wetlands, coordinating with other agencies for resource protection, and adopting assorted regulatory approaches to floodplain resources have all risen significantly.

The context also has changed considerably in the past six years. As noted in the 1992 report, a sizeable number of states had then only begun participating in floodplain preservation, and had also realized that emphasizing the environmental benefits of floodplain management programs was a key to obtaining wide public support. State responses to the 1995 questionnaire indicated that, since then, holistic approaches to planning, preservation, and flood loss reduction have become more a matter of course. The focus of the past three years was not on raising public and official awareness as it had been in prior years but rather on taking advantage of that awareness to integrate formerly "environmental" concerns with flood planning, recovery, and management, and to set up routines and procedures for coordinating such matters.

Evaluation of State and Local Activities Most of the information presented in this report is a simple accounting of which states "participate" in which kinds of floodplain management activities. It is evident, however, that simply noting that a state considers itself to be conducting or participating in an activity says nothing about the amount of state funding provided for that activity; the size, knowledge and experience, or

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[5] For any given activity, a net increase or decrease in participation of only one or two states was considered negligible. The only exception is regulating special hazards which, although it only showed a small net decrease in participation since 1992, also had decreased slightly from 1988 to 1991. This bears mentioning because it may be the beginning of a trend.

[6] The State Assistance Program from FY1981 to FY1985 and the Community Assistance Program from FY1986 to the present.

dedication of the staff devoted to it; the extent of technical and other support available for the task; or the thoroughness with which policies are implemented and laws enforced. These factors are crucial but they also are, unfortunately, practically impossible to assess objectively. Nor does this information convey how effective the various activities actually are in reducing the states' vulnerability to flood damage or in preserving its floodplain resources.

Factors Influencing State and Local Floodplain Management

- The presence or absence of flooding over a period of years still has a strong influence on the level of public and legislative support floodplain managers get for both ongoing efforts and proposed new ones. The 1993 Midwest floods raised the public's awareness of flooding issues nationwide.

- Mitigation has become the byword of all hazards management, and tried and true floodplain management techniques are fitting right into that broader, longer-term focus.

- The nation's conservative mood and budget consciousness have proven problematic for some state programs.

- Environmental awareness is still fairly high among the public, and floodplain management is becoming more intimately connected to resource protection programs where appropriate.

Status of State and Local Floodplain Management

In general, floodplain management at the state and local levels in the United States today appears to be progressing, although perhaps not as quickly as might have been expected given the high visibility of flooding issues over the last three years. In response to the survey used for this report, 18 states reported that floodplain management within their jurisdictions had grown steadily stronger over the past six years; six states said that it had stayed about the same; and six said that it was weaker now than both three and six years ago. The remaining 10 states indicated mixed changes—either floodplain management is stronger now than three years ago but weaker than it was before that, or vice versa. These judgments are borne out by most of the rest of the data gathered.

Some troubling developments are looming on the horizon, however.

There are two streams of change discernible among the findings presented in this report, and they appear to be moving in opposite directions. On one hand, states report that they are undertaking more floodplain management activities now than ever before,

and there are certainly numerous examples of successful and effective work. On the other, the fundamental components of state-level programs do not seem to be as robust as in prior years. State floodplain management budgets (unadjusted for inflation) are down 12% from their 1992 levels—a disturbing statistic in itself. The legal authority under which programs operate has been weakened in some state legislatures and challenged both there and in the courts. More than one-fifth of the state floodplain management programs have been through governmental reorganizations in the past few years, and more are in prospect. Of course, a certain amount of fluctuation in the stringency of state and local

Trends Identified by Some States, 1992-1995

Training and workshops (including those put on by the state floodplain managers' association) have educated local officials and state staff over the past three years, and our public outreach program has been effective in increasing public awareness. A new Urban Streams Restoration Program has built public support for floodplain management and more public awareness. There is now strong support for environmental protection. Limited funding inhibits the state's ability to take advantage of new technologies that have floodplain applications, e.g., geographic information systems and global positioning systems. We have witnessed increased emphasis on local compliance with NFIP standards. Our winter floods were a wakeup call for many localities.

[California]

The state is less environmentally aware than before, and more property-rights oriented. Regulations have become less restrictive, resulting in more unwise floodplain development.

[Indiana]

Floodplain management is diminishing in strength due to reductions in funding and staff. It has been too long since we were flooded.

[Maryland]

Floodplain management is in a state of flux. There has been increased public awareness, but less support for the environment in the legislature. Staff changes within the agency have allowed staff to be closer to local units, thereby improving the state-local partnership.

[Michigan]

There has a been a renewed interest in structural flood control through Corps projects. The availability of flood hazard mitigation grants as a result of our 1992 flood disasters has stirred some local interest but there is little real understanding of mitigation concepts at the local level. Funding for additional staff and new programs has been limited for many years.

[New Jersey]

It is difficult to measure changes over the past three years. Statewide trends are influenced by the sensitivity of the local enforcement officials. Communities that are monitored frequently tend to be requesting more technical assistance, usually coastal communities where more is at stake. Communities that have retained local building officials tend to be more aware of floodplain management requirements. Their turnover tends to stabilize any changes in the program. Overall, there has probably not been much change.

[Rhode Island]

Since 1990, a broad-based, strong floodplain management program has been built, but continued diminution of resources is now eroding it. The past gains are still in place—a strong executive order for floodplain management, better utilization of coastal zone management opportunities and funds, coordination with other programs, etc.—but they will be difficult to sustain in the future with loss of staff. There is also the strong potential for the program to lose its identity by being meshed with other programs.

[Virginia]

laws is to be expected over the course of three years and across a nation of this size and complexity. Likewise, in any given period a certain number of states will be making adjustments to the structure of their government agencies. But more instances of these kinds of fundamental changes—to the detriment of floodplain management—have been noted during the last three years than in previous periods. In fact, several additional instances have occurred since the information for this report was collected.

This is a troubling finding, because without strong financial, legal, and operational foundations, effective state and local floodplain management is doomed. If these building blocks are undermined, it will be only a matter of time until a measurable decrease in the level of state activity is also noted—and that will inevitably be followed by higher flood losses.

It is possible that the tighter budgets are simply a short-term fluctuation, and that it is just a coincidence that the number and extent of state-level reorganizations and other apparent threats are occurring at the same time. And it may be that the proposed changes to state laws that have been introduced in legislatures will be defeated. Or there may be some other unforeseen but benign explanation.

In any case, these potential shifts in the status of state and local floodplain management will need careful scrutiny over the next three years so that potential threats to effective programs can be detected and defused. The next triennial report (for 1998) should shed further light on their meaning and impacts.

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Appendix

PROFILES OF STATE PROGRAMS

ALABAMA

State-level floodplain management activities in Alabama continue to fall into two categories: routine actions by state departments and agencies to comply with state regulations, and efforts to meet National Flood Insurance Program requirements. Federal assistance is provided by the Federal Emergency Management Agency under the Community Assistance Program.

As a result of a Governor's Executive Order in 1991, the Office of Water Resources was created within the Alabama Department of Economic and Community Affairs. The governor's action provided additional emphasis on water and floodplain issues. The office is charged with coordination of the development and protection of Alabama's water resources, including floodplain management. Floodplain management formerly was a function of the Planning Division.

A comprehensive program of floodplain management assistance is being carried out. This includes assessments of 40 communities annually to determine the adequacy of their floodplain management programs. Technical assistance is provided to strengthen enforcement of community flood damage prevention ordinances.

A visitor center is being completed at the Weeks Bay Estuary. This is significantly increasing public awareness of this protected wetland.

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ALASKA

The Department of Community and Regional Affairs (DCRA) is the state coordinating agency for the National Flood Insurance Program. DCRA has seven regional offices throughout the state. During the past year, personnel in these offices have been receiving additional training about the variety of floodplain management assistance requests that so far have been handled by the Anchorage-based coordinating officer.

DCRA provides technical assistance to boroughs, cities, and villages in coping with floodplain management and erosion problems. Mortgage lender workshops, assistance in flood hazard determinations, and help for property owners, insurance agents, and developers are also provided. Specific activities conducted under a cooperative agreement with the Federal Emergency Management Agency include community assessment visits; community assistance contacts; publication of a newsletter, *Alaska Flood Report*; and constant assistance on ordinance revisions and updates.

Dealing with the Upton-Jones Amendment and erosion problems throughout the state continued during the last three years. Detailed assistance has been provided to local governments and individuals trying to utilize the Upton-Jones provision to relocate or demolish structures undermined by erosion. Coping with condemnation requirements in local jurisdictions that lack uniform building codes, the associated land use issues and setback standards, and public awareness has been a primary task for the DCRA.

Anchorage has taken the lead in developing a revegetation guide for use in construction-related projects in south-central Alaska. The city has become increasingly concerned about the lack of consistently applied revegetation guidelines associated with the permitting process. Vegetation along streams and lakes is particularly important for public health and safety, for recreation, for fish and wildlife, and for the health of the water body itself. Riparian vegetation also reduces erosion and stabilizes streambanks and lakeshores to prevent property loss. Municipal involvement in state and federal permit reviews has emphasized the need for appropriate revegetation measures, because no one state or federal agency is able to emphasize permit-associated revegetation efforts.

Numerous map revisions and amendments have been undertaken as culvert, bridge, and other urban drainage improvements occur in Juneau. The city has completed its wetlands protection ordinance and local wetlands management plan.

Alaska continues to maintain a statewide inventory of dams, classified according to the frequency with which they require inspection. The database includes information on the dam's height, size of reservoir, and location in relation to population and property. The state has the authority to require that dam owners correct any unsafe conditions discovered during periodic inspections.

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ARIZONA

The Arizona Department of Water Resources (DWR) continues to participate in the Community Assistance Program by performing community assistance visits and community assistance contacts, conducting workshops, publishing newsletters, and providing technical assistance to communities.

The *Handbook for Arizona Communities on Floodplain Management and the National Flood Insurance Program* is being rewritten. Communities have been given the opportunity to let us know what additional information should be included and a committee of several floodplain administrators has been formed to participate in this project.

State statutes require that base flood elevations be delineated prior to development, in accordance with criteria established by the Director of Water Resources. A state standards workgroup, consisting of two urban county representatives and two rural county representatives, the chair of the Technical Committee of the Arizona Floodplain Management Association, and a representative of DWR, continues development of criteria. To date the following standards have been developed and adopted:

SS1: Requirement for Flood Study Technical Documentation—Documentation guidelines for floodplain delineation studies;

SS2: Floodplain Mapping in Riverine Environments—Methodologies for determining riverine flood hazard areas in Arizona;

SS2 Supplement 1: Administrative Floodways—Methods for establishing minimum floodplain management requirements where better data or methods do not exist;

SS3: Floodway Mapping in Supercritical Streams—HEC-2 modeling procedures for steep streams;

SS4: Sheet Flow—Definitions of sheet flow types and floodplain management in sheet flow areas.

The group is working on standards for islands in the floodway, sediment balance in river systems, and hydrology of ungaged watersheds.

After our statewide flooding in January and February 1993, the state legislature appropriated funds for a statewide flood warning system. The staff is working with the U.S. Army Corps of Engineers, the National Weather Service, the Bureau of Reclamation, the Salt River Project, the Bureau of Indian Affairs, and Arizona's communities on this endeavor. Its completion is at least five years away.

National Flood Insurance Program (NFIP) staff coordinated with the Arizona Division of Emergency Services after the 1993 Arizona floods and participated in the initiation and coordination phase of a buy-out of the Winkelman Flats area in Gila County. This residential area was located below Coolidge Dam on the Gila River and was under water for approximately one month. All pre-FIRM residences were totally destroyed. One post-FIRM structure was not substantially damaged because it had been elevated, proving that floodplain management does work. All the structures were purchased using a combination of Section 1362 funds, hazard mitigation grant program funds, and state funding. The buyout was completed in approximately six months and all residents relocated out of harm's way. We are now seeking resources to turn this area into a regional park and riparian habitat.

The Arizona Floodplain Management Association (AFMA) continues to meet three times a year in different regions of the state. Technical and administrative workshops are always part of

the first day of this two-day meeting. Short courses on technical subjects such as the HEC computer programs and sediment and erosion processes have been sponsored. AFMA continues to provide invaluable support for Arizona's flood management and mitigation programs.

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CALIFORNIA

Background

The Department of Water Resources (DWR) administers the state floodplain management program and coordinates National Flood Insurance Program (NFIP) activities. There are nine full-time equivalent staff in DWR's headquarters in Sacramento and four district offices. They 1) provide information, educational materials, and technical assistance to other state agencies, local governments, private entities (lenders, insurance and real estate agents, developers), and the general public on floodplain management and NFIP requirements; 2) under high-water conditions, coordinate aerial photography and high-water staking activities with federal, state, and local agencies; and 3) after state and federally declared flood and flood-related disasters, participate on state hazard mitigation plan updates and hazard mitigation activities with the Federal Emergency Management Agency (FEMA), the state Office of Emergency Services (OES), and local government agencies. Over 93% of the state's 528 communities participate in the NFIP.

Educational materials have been developed for community officials and the public. They include a floodplain management handbook, a guide for preparing a pre-flood hazard mitigation plan, a model ordinance for regulating floodplain development, a flood awareness kit, a floodplain management newsletter (with a circulation of 2,200), and a public outreach floodplain management exhibit for which the state received the Association of State Floodplain Managers' Tom Lee Award in 1989. Between 60 and 75 audits are performed each year to review local compliance and administration of floodplain ordinances and to identify technical assistance needs.

In 1977 Governor's Executive Order B39-77 was issued to direct state agencies to reduce the risk of flood damage in connection with their construction, funding, and permitting programs. The California Colbey Alquist Act (1965) requires local governments who receive state financial assistance on flood control projects to prepare a floodplain management plan for an area at least to the limits of the flood control project right-of-way. California Senate Bill 2161 (1990) requires local communities to provide DWR with copies of each tentative map of any proposed subdivision (within three days after submission to the local community) located within a 1-mile radius of the State Water Project (SWP) system right-of-way for review and recommendations. This is part of a comprehensive program to alleviate present and future potential problems from urban encroachment upon the existing SWP system or to proposed additions to the system.

Other floodplain management and public safety programs in DWR are:

- California's Safety of Dams Program (started in 1929), which regulates more than 1200 non-federal dams with a staff of 55 professional engineers and geologists.

- Flood Forecasting Program and the Maintenance and Operation of Flood Control Facilities Program.

- Technical assistance to the state Reclamation Board's Designated Floodway Program, which plans and adopts floodways to assure safe passage of flood flows through floodprone areas (primarily in the more rural areas in the Central Valley where the Board has jurisdiction) and to its Encroachment Permitting Program, which controls encroachment on federal flood control projects and designated floodways through a permitting process.

- A Flood Control Projects Program that provides technical planning assistance for flood control projects under the Reclamation Board and DWR authority.

- An Urban Streams Restoration Program that provides advice, technical assistance, and competitive grants to partnerships between citizen groups and local government agencies working to solve floodplain problems and benefit stream ecosystems with innovative, low-cost, watershed-based techniques.

Some floodplain management activities are performed by other agencies. Regulation of coastal development is administered by the state Coastal Commission through a permitting process. The Commission also can certify a community for issuance of coastal development permits. Dam inundation maps and communities' dam failure evacuation plans as required by state law are approved by OES. Stormwater management plans are done primarily at the local level. Some local jurisdictions are planning detention basins to reduce peak loads downstream, meet non-point source pollution requirements of the federal Clean Water Act, and create opportunities for improved wetland and floodplain functions.

Recent Activities

Wetlands—A Governor's Executive Order W-59-93 was issued on wetlands conservation in 1993. DWR appointed a Wetlands Coordinator whose responsibilities include identifying and implementing, where practicable, opportunities to enhance wetlands as part of new or existing flood control and water management projects.

Community Rating System—Twenty-four communities were approved as participants in the NFIP Community Rating System in 1990 and that number increased to 45 in 1994.

State Association—The California Floodplain Management Association was formed in 1990 and now has a membership approaching 300. The state association holds two technical conferences a year and publishes a newsletter six times a year.

Training—The format for our community officials workshop has been revised and patterned after the Floodplain Management 101 class taught at the Emergency Management Institute in Emittsburg, Maryland. FEMA Region 9 and DWR staff developed this training course into an eight-hour workshop and completed six workshops this year using this format to train approximately 200 local officials.

Public Outreach—The floodplain management exhibit, which was displayed annually (beginning in 1988) at the state fair and local fairs was replaced in 1993 with a floodplain model depicting various floodproofing techniques. The model was developed by the U.S. Army Corps of Engineers for the state under its Floodplain Management Services Program. The state received an Honorable Mention for the Tom Lee Award for this floodplain model exhibit in 1994. DWR entered into a cost-sharing agreement with the Corps under its Section 22 program for developing an alluvial fan model. We hope to have this model ready for display at the 1996 Association of State Floodplain Managers conference.

Building Codes—Collective efforts by FEMA, DWR, and the staffs of Kern and San Diego counties resulted in the inclusion of floodplain management construction standards in the Flood Resistant Construction Section of the appendix to the Uniform Building Code.

Mitigation —The state's Flood Hazard Mitigation Plan is being revised as the result of the 1995 winter storms, which resulted in state and federal flood disaster declarations for all 58

counties. Many communities are preparing their flood hazard mitigation plans for use in their application for flood hazard grants. The hazard mitigation grant program is administered by OES. DWR is working with OES to provide application assistance to communities and will be part of the grant review team.

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COLORADO

Over the past three years the Flood Control and Floodplain Management Section of the Colorado Water Conservation Board (CWCB) has improved its computer capabilities, both for data management and for engineering applications. The state has continued to coordinate hydrologic and hydraulic analyses by federal, state, local, and private entities throughout the state. The section has tried valiantly to convince the Federal Emergency Management Agency (FEMA) of the need to cost-effectively revise Flood Insurance Studies using all available resources. Updating of outdated maps is a priority for the state, even in the face of reduced FEMA funding. With various federal, state, local, and private entities, the staff helped supervise the design and construction of several structural projects. One interesting trend has been an increase in the number of subsurface drainage projects.

For some reason, real estate agents, lenders, insurance agents, and property owners have identified the CWCB as the place to phone for information related to flood determinations. The increase in phone calls has significantly impacted state staff.

The staff has participated actively in the Colorado Association for Stormwater and Floodplain Management and in the Colorado Natural Hazards Mitigation Council. The staff put together a regional conference on "Multi-Objective River Corridor Management in the Arid West" in Telluride, Colorado. The staff has also worked with the National Park Service on multi-objective planning.

Several public education efforts have been conducted. The staff publishes newsletters on flood hazard management. The newsletter readership has been surveyed annually to obtain comments and ideas for improving the publication. The annual Flood Awareness Week activities, including a poster contest for school children (with the governor presenting awards) have continued. Section staff constructed a working hydraulic model demonstrating floodplain management concepts to be used for public education in schools.

Along with other western states, Colorado has continued working on ways to cope with flood problems peculiar to the arid West, such as the regulation and management of debris flows, alluvial fans, and unstable channels.

Colorado now has one of the highest National Flood Insurance Program Community Rating System participation rates in the nation.

The staff assembled a Colorado Flood Task Force for anticipated snowmelt flooding in 1995. This multi-agency group met weekly to monitor the flood threat and to coordinate response activities. Snow levels, temperatures, and streamflows were monitored to allow some prediction of timing and level of peak flows. The Task Force was helpful to local officials and it was well received. The CWCB is beginning to assist 1995 flood-impacted communities in adopting local flood hazard mitigation plans.

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CONNECTICUT

Background

The Department of Environmental Protection (DEP) administers the State Floodplain Management Program (through its regulation of state agency activities) and coordinates the National Flood Insurance Program (NFIP). All full-time staff are assigned to the Inland Water Resources Division (IWRD), which is located at DEP headquarters in Hartford. The Flood Management Section devotes all of its time to floodplain management, while three other sections contribute significant amounts of assistance—Engineering Services, Stream Channel Encroachment, and Dam Safety.

The Governor's Executive Order 18, which was codified into Connecticut General Statute 25-68, directs all state agencies to insure that all their construction, funding, and permitting actions consider flood hazard standards.

Recent Activities

A base station for the statewide automated flood warning system is operated by staff in the Floodplain Management Section. The system utilizes automated rainfall and river gages, which transmit data via VHF radio signals to the computer base stations. Radio repeaters are used to relay data to the base stations from gages outside the Hartford area. Once received, the precipitation and river data are stored in the base station computers. Special software is used to analyze the data and alert IWRD staff of potential flooding conditions before they occur. The data are also used to monitor rainfall and prepare river flood forecasts. Rainfall and river data are automatically transmitted to the Northeast River Forecast Center and stored for hourly transmission to the rest of the National Weather Service (NWS) facilities in southern New England. The NWS is responsible for preparing the flash flood watches and warnings that are broadcast over radio and television in Connecticut.

Many of Connecticut's communities have been working with ISO Commercial Risk Services Inc., to achieve participation in the NFIP Community Rating System. Several communities have achieved class 9 status, and one (Hamden) was recently upgraded to class 8.

The Dam Safety Section of the Inland Water Resources Division is charged with the administration and enforcement of Connecticut's dam safety laws. State law requires that permits be obtained to construct, repair, or alter dams, dikes, or similar structures. Additionally, existing dams, dikes, and similar structures must be registered and periodically inspected to assure that their continued operation and use does not constitute a hazard to life, health, or property. Recent legislation requires DEP to issue public notice (in detailed description) of proposed activity.

The Stream Channel Encroachment Line Section recently completed a restudy and expansion of the Norwalk River stream channel encroachment lines.

Mitigation

Assistance was provided at federal Disaster Application Centers after coastal flooding in 1992. Since then, DEP has administered nine hazard mitigation projects for over $700,000. The projects included 1) retrofitting structures to elevate lowest floors above the base flood elevation, 2) constructing retaining walls adjacent to rivers, 3) public information publications, 4) automated flood warning systems, and 5) coastal hurricane evacuation systems.

In 1995, floodplain management staff completed a hazard mitigation survey to determine the level of awareness and preparedness in Connecticut municipalities. The results indicated that a greater level of awareness is needed. Most local officials saw preparedness for post-disaster

response as mitigation. Few distinguished it to be the permanent reduction or elimination of potential damage.

Training Local Officials

Each year the Floodplain Management Section conducts workshops to increase the public's awareness of NFIP and related issues. This September the division will conduct four workshops. Two will be introductory in nature, while the other two will be more advanced, dealing primarily with construction design issues.

Newsletter

The floodplain management section publishes its newsletter, *The Torrent*, tri-annually. This year circulation has increased, and more emphasis has been given to multi-hazard mitigation.

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DELAWARE

The Delaware Department of Natural Resources and Environmental Control, Division of Soil and Water Conservation continues to administer regulations governing (1) sediment and erosion control and stormwater management through the Sediment and Stormwater Program, and (2) construction on bay and coastal beaches through the Coastal Construction Program and the Regulations Governing Beach Protection and the Use of Beaches.

The Sediment and Stormwater Program requires that all new development obtain an approved sediment and stormwater management plan, before any land-disturbing activity associated with construction. In addition, the program staff is involved in the planning and development of retention/detention basins and community outreach programs. In May 1995, the staff completed the Dover Mall retention basin project by planting wetland plants around it with area high school students and their teachers.

The Coastal Construction Program requires that letters of approval or permits be obtained for development within 1,000 feet of the Atlantic Ocean and Delaware Bay. The program staff regulates construction from Pickering Beach (on the bay) to the Delaware/Maryland state line at Fenwick Island (on the ocean). In March 1995, the staff organized and coordinated the planting of Cape American beachgrass along the bay and ocean coasts. About 600 volunteers from all over the mid-Atlantic region participated, resulting in approximately five miles of newly planted (and protected) dunes.

The Division currently employs two full-time persons to administer the Community Assistance Program (CAP) and the Hazard Mitigation Grant Program (HMGP) in Delaware. CAP obligations include assisting local communities in remaining compliant with National Flood Insurance Program regulations, publishing a quarterly newsletter, and conducting workshops for community officials and surveyors and engineers. The Floodplain Management for Surveyors and Engineers Workshop is recognized by the Delaware Board of Professional Land Surveyors, resulting in professional development units for workshop participants.

Since FY1993, the state has been developing a State Hazard Mitigation (409) Plan. In FY1994, the state created a hazard mitigation office and began implementing hazard mitigation projects in response to three federal disaster declarations. The State Hazard Mitigation Team has been created to develop mitigation projects, review and prioritize projects, and conduct planning activities.

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FLORIDA

Over the past several years, the State Assistance Office for the National Flood Insurance Program (NFIP) has heightened its floodplain management activities to better serve residents, businesses, and local governments. These activities primarily relate to increased program staffing, retrofitting and flood mitigation workshops, real estate agent workshops, and the Community Rating System (CRS).

Governor Chiles and the Florida legislature have demonstrated their support of floodplain management activities by creating an additional state-funded position in the State Assistance Office for the NFIP. This position, a Planning Manager, was created only one year after the program was authorized to employ an Engineer II. The engineer position has demonstrably added to the program's ability to provide detailed technical assistance to architects, contractors, and engineers. Additionally, this position increases the program's involvement with mapping, surveyors, and geographic information systems. The program has a total of six positions.

The 1994 and 1995 Florida legislature, with the governor's support, provided approximately $1 million in flood assistance through the Hurricane Andrew Recovery and Rebuilding Trust Fund to assist residents of south Dade County who were impacted by Hurricane Andrew in 1993. Specifically, impacted homeowners may use these funds to elevate their pre-FIRM structures to current base flood elevation levels and meet other code requirements.

Since Hurricane Andrew, the State Assistance Office for the NFIP is on a mission to insure that residents, businesses, and civic and neighborhood associations know first-hand how to better protect human lives and property from flood damage. The program is taking retrofitting and flood mitigation techniques from court houses, city halls, and planning, building, and zoning departments into neighborhoods. The program provides a comprehensive strategy of retrofitting and flood mitigation techniques and tools with a focus on existing pre-FIRM structures. As such, the program will emphasize proactive pre-disaster activities to assist repetitively damaged structures, which should reduce post-disaster damage and costlier mitigation actions. As the Federal Emergency Management Agency Director James Lee Witt has indicated, "We must and can work to design and build our communities better and out of harm's way. It is time for us to change the focus from disaster response to disaster mitigation." Our State Assistance Office for the NFIP believes that pre-disaster retrofitting provides a good approach to assisting a structure's occupant with breaking the cycle of flooding, rebuilding, and flooding again. These retrofitting and flood mitigation workshops, which are conducted at the neighborhood level, should also educate the public to the usefulness of the new Flood Mitigation Assistance Program.

Coordination and cooperation with relevant organizations must be done continually to achieve flood loss reduction objectives. The State Assistance Office for the NFIP has taken another step toward achieving these objectives by conducting workshops with real estate agents. The agents provide an initial and crucial link with homeowners and their awareness of special flood hazard areas. Therefore, in conjunction with local building departments, we have been conducting workshops to educate real estate agents about the floodplain management regulations generally and the more detailed substantial improvement/substantial damage provisions specifically.

Florida has 175 communities participating in the CRS. Their ratings range from a class 9 to class 5, which the City of Sanibel will shortly receive. Their participation was facilitated by state legislation that enacted the Local Government Comprehensive Planning and Land Use Development Act, as well as the activities of our Comprehensive Emergency Management Program and the Regional Water Management Districts. The CRS repetitive loss communities will be especially helped by the Retrofitting and Flood Mitigation Workshops.

A special activity that will assist coastal CRS communities is the Florida Coastal Floodplain Management Data and Maps project. This project will produce digitized map overlays of the Flood Insurance Rate Map and the Coastal Construction Control Line that is administered by the Florida Department of Environmental Protection. These overlay maps will make the community's floodplain maps more current, useful, and accurate. This project is funded jointly by the Florida Coastal Zone Management Program and the Geographical Information System Section within the Florida Division of Emergency Management.

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GEORGIA

The Floodplain Management Office is part of the Water Resource Management Program of the Environmental Protection Division of the Department of Natural Resources. The office functions primarily as a liaison between community officials and the Federal Emergency Management Agency in the administration of the National Flood Insurance Program (NFIP). Community officials are aided in interpreting the federal regulations and in specific site location problems. Multi-community workshops have been carried out successfully; several communities in the state have requested them.

About 400-500 flood maps are distributed each month. Numerous phone calls are handled each day, ranging from insurance agents wanting zone information to simple complaints about flooding problems. Federally funded or permitted projects are reviewed along with state-funded projects such as the construction of schools, libraries, or parks. The office has recently automated its community status list, which is updated as needed, usually when new maps are printed or when communities are converted into the regular phase of the NFIP. The office also assists other state agencies with NFIP matters.

The location of the floodplain office within the Environmental Protection Division enables coordination of project review within the comprehensive permitting process whereby water withdrawal, safe dams, wastewater, and other environmental permits are all issued by the same agency. This helps to ensure compliance with NFIP requirements, and also with Executive Order 11988.

All participating Georgia communities have adopted their own flood damage prevention ordinances and most have added freeboard requirements, with many exceeding two feet. Most communities perform an adequate job of floodplain management.

Georgia has traditionally been a state with strong home-rule attitudes; in fact, land use and zoning powers are constitutionally reserved to local governments. However, with rapid growth (fifth in the nation over the last decade), the need for state action in some land use matters has become clear. A governor-appointed Growth Strategies Commission is looking at the numerous challenges posed by the rapid growth. The commission is expected to recommend mandatory local land use plans with state overview. Floodplain management will certainly be an integral part of that planning process.

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HAWAII

In Hawaii, considerable floodplain land has been utilized for urban development and for agriculture. When floods occur, the normal activities of these areas are disrupted, production impaired, transportation lines cut, property and crops damaged, soils eroded and in some cases completely lost, and human life endangered.

Tsunami and storms that produce heavy rainfall or high surf are the major causes of flooding in Hawaii. Damage from storm runoff includes losses to agricultural lands and to such public property as roads, bridges, and parks. Besides inundating land, the tremendous force of a tsunami is capable of destroying everything in its path, extensively eroding beach and coastal areas. Flooding from ocean water, with its high salt content, can also damage vegetation and farm crops.

Flood problems in Hawaii generally occur in older areas that were developed without any flood protection measures. Some areas have flood control improvements that, by present standards, are inadequate to contain or control larger floods.

Storm Flooding

Heavy rainfall creates three types of flooding in Hawaii: channel overflow, overland stormwater flow, and standing water in poorly drained areas. Some factors that contribute to flooding are:

- inadequate drainage facilities due to changing drainage conditions caused by continued development;
- undefined stream flow patterns;
- clogging of streams by debris, sediment, and overgrown vegetation; and
- isolated topographic depressions.

Flash floods predominate where drainage areas are small and slopes are relatively steep. A flash flood is caused by rainfall of high intensity and short duration, which produces maximum runoff and recession within a short period of time. It is not uncommon in Hawaii for a flash flood to occur in a sunny, dry area from intense rainfall in the upper reaches of the drainage basin.

High Surf and Tsunami

High surf conditions that occur with less than annual frequency can cause considerable damage along beaches and in low-lying areas. High waves caused by storms and hurricanes may last a long time and cause excessive erosion damage. High surf generally affects the exposed northern section of each island. Damage has been heaviest on Oahu because of extensive development in the coastal areas of the north shore.

Tsunami, caused by underwater seismic disturbances such as earthquakes and volcanic activity, are one of the most destructive natural forces to reach the Hawaiian islands. Although tsunami are infrequent, they are a serious threat because of their devastating damage potential.

Floodplain Management

As the designated flood control coordinating agency of the state, the Department of Land and Natural Resources is part of a group of government agencies involved in the overall program

of preventive and corrective measures for reducing damage in floodprone areas. Proper management consists of identifying the nature of flooding for an area, evaluating the available alternatives, and implementing the appropriate measures to solve the flooding problem or lessen its impacts.

There are numerous strategies available to the contemporary floodplain manager with which to develop an effective and balanced program. These are often divided into structural and nonstructural approaches. Nonstructural approaches do not attempt to control flood waters, but rather emphasize reducing the susceptibility to floods and reducing the impacts of floods on the individual and the community. Some of the more important nonstructural strategies include zoning ordinances, subdivision regulations, building codes, land acquisition, relocation, tax incentives, and emergency preparedness. Nonstructural approaches should be pursued by the floodplain manager before or in conjunction with structural ones. Structural approaches attempt to modify the course of flood waters through dams, levees, channel alterations, spillways, and other physical measures.

Land Use

Land use in Hawaii is determined by both state and county action. The state Land Use Commission classifies land as urban, agricultural, or conservation. Agricultural land uses are prescribed by state law; lands classified for conservation are regulated by the Department of Land and Natural Resources; and county governments must plan for and regulate the use of urban areas. Counties have authority to use development plans, subdivision regulations, building codes, and shoreline management regulations to ensure wise flood hazard management.

National Flood Insurance Program

The Department of Land and Natural Resources undertakes floodplain management activities, some of which are funded through Federal Emergency Management Agency grants for the National Flood Insurance Program. Over the last few years these have included annual community assistance visit contacts to the four counties of Hawaii, regional state coordinators' meetings, flood loss reduction workshops, public informational displays on flood loss reduction, general technical assistance, and other floodplain management activities such as disaster assistance to the counties, assistance for restudy for Flood Insurance Rate Map revisions, and flood information dissemination.

Dam Safety

For dam safety, the department reviews applications for approval for the repair, enlargement, construction, or abandonment of dams to conform with dam safety regulations; conducts dam safety workshops; updates the Hawaii National Dam Inventory for Phases I and II; assists in emergency actions; and conducts dam safety inspections.

Recent Floods

The most recent flood occurred on August 12, 1994, mainly in downtown Hilo on the Island of Hawaii, where $3.6 million in damage occurred. On September 11, 1992, Hurricane Iniki caused more than $2.2 billion in damage and four deaths on the Island of Kauai.

Interagency Hazard Mitigation Team recommendations that grew out of a 1988 flood disaster included improving warning systems, reviewing landslides and debris flow risks within

the state, and a variety of measures to increase public flood awareness. The Department of Land and Natural Resources' is continuing these and other mitigation efforts as are part of its everyday coordinated activities of floodplain management.

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IDAHO

The Department of Water Resources has been designated by executive order to be the state coordinating agency for the National Flood Insurance Program (NFIP). Idaho does not have any state laws or regulations that govern the development of floodplains, but relies on community participation in the NFIP for regulation and enforcement of floodplain development and reduction of flood losses. In Idaho, 145 communities have adopted ordinances and participate in the NFIP; 20 communities have designated floodplains but have opted not to participate. Idaho has been in a drought for the last seven years and has experienced only small, isolated floods.

Idaho's floodplain management program focuses on conducting community assistance visits; helping communities update their floodplain ordinances; publishing and distributing a quarterly newsletter, *The Idaho Waterlog*, to approximately 750 community officials, insurance agents, lenders, and state and federal agencies; publishing the *Guidebook for Local Floodplain Ordinance Administrators*; and conducting NFIP Community Rating System workshops for local officials and floodplain administrators. Floodplain information is disseminated to communities, lenders, and insurance agents throughout the state by means of a report entitled *Floodplain Management in Idaho*, which is updated periodically. The report contains a floodplain map inventory; list of communities participating in the NFIP; the names, addresses, and phone numbers of local administrators; and flood insurance information (number of policies issued and claims paid for each community).

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ILLINOIS

In addition to providing routine flood insurance coordination, community assistance, and public education, the state directly regulates development within floodways of rivers and streams and in public waters including Lake Michigan, inspects dams, and helps plan and fund structural flood control projects.

State legislation provides clear legislative authority to consider storage effects when defining floodways and also for restricted uses in northeastern metropolitan floodways (which are directly regulated by the state) to those designated as "appropriate uses." These uses are deemed to include flood control structures, functionally dependent uses, some recreational facilities and parking lots, and detached accessory structures that do not block flood flows.

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INDIANA

The state's 1945 Flood Control Act underwent some major revisions in 1993. Strong pressure from various sources caused the state to lose some of its permitting authority. Local officials now have the responsibility of permitting additions to existing houses in the regulatory floodway. As part of the permit review, the local official must determine if the addition is "substantial" or "non-substantial." Under the act, only "non-substantial" additions are permitted. Further, the engineering analysis that Division of Water staff once performed must now be done by a private engineering company and reviewed by the local official for compliance. As a result, not only does the local official have additional responsibilities, but the homeowner has the added expense of hiring an engineering firm to do what the Division's engineers once did as part of the permit review.

In addition, the act now allows for the reconstruction of residences in the floodway that have incurred substantial damage by forces other than floodwaters where previously this was completely prohibited. These amendments have weakened the state's governing powers in the floodway.

While 1993 brought major flood disasters to surrounding states, Indiana received very little damage. The flooding did, however, prompt several communities to join the National Flood Insurance Program (NFIP).

Other achievements since 1992 include conducting a number of NFIP Community Rating System (CRS) workshops throughout the state; attending CRS verification visits; participating in workshops conducted by the state Emergency Management Agency; attending community projects forums to provide further assistance to local governments; and publishing a biannual newsletter for distribution to local officials, lenders, real estate agents, and the general public.

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IOWA

Iowa's floodplain management program is primarily carried out by the Iowa Department of Natural Resources and consists of four main program areas: a state-level floodplain permit program, dam safety, coordination of the National Flood Insurance Program (NFIP), and community assistance and oversight for communities and counties with delegated permitting powers. Emergency response and federal mitigation funds are primarily handled or coordinated by the state's Emergency Management Division, part of the Iowa Department of Public Defense.

Over 150 Iowa communities and counties have adopted Department-approved, comprehensive floodplain management ordinances. Floodplain development in other floodprone areas is subject to state floodplain permit requirements regardless of NFIP participation status. In addition, all state agencies are required to obtain state permits for floodplain development.

The 1993 Midwest floods resulted in extensive damage in Iowa, as all 99 counties received Presidential disaster declarations. Although the unprecedented 1993 flooding focused attention on emergency management and mitigation, the floods did little to raise the awareness of the benefits of floodplain management. The level of state resources devoted to floodplain management was cut significantly approximately 10 years ago and, while the funding levels have remained steady over the past three years, the resources available fall far short of the needs and statutory responsibilities of the Department. It is unlikely that additional resources will be forthcoming, despite the 1993 flooding.

The 1993 floods also revealed that local floodplain management capabilities vary considerably, especially with respect to administering the substantial damage clause. Some communities aggressively pursued determinations of substantially damaged structures while others virtually ignored those provisions until they were informed of the requirements. A community's capabilities are not necessarily a function of size, as some smaller communities performed admirably. The 1993 flood experience did point the need for additional training and assistance for local officials.

Approximately 800 homes are being acquired, relocated or elevated using Section 404 mitigation funding provided as a result of the 1993 floods. In addition, a number of other mitigation projects are being funded. In three Iowa communities with buyout programs, the staff of the National Park Service's Rivers, Trails and Conservation Assistance Program is providing assistance in turning the buyout areas into open space.

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KENTUCKY

The Division of Water, through the Water Resources Branch, administers a floodplain and dam construction permitting program, a dam safety and floodplain compliance program, and a water withdrawal and water supply planning effort. The floodplain permitting regulations are broad in scope. Any activity in the 100-year floodplain potentially would require a permit or other form of approval. We have been very successful in recent years in working with other state agencies on proper floodplain construction and management as they relate to economic development, transportation projects, and water and wastewater facility planning.

Although we continue with efforts to inform and educate local governments, we are not as successful in that arena. There are, however, bright spots with our involvement with many local governments. Many of our past problem communities have now become some of our most diligent floodplain ordinance enforcers. The division also reviews and permits dam construction and must perform a final inspection before impounding is allowed. About 1,000 dams are inspected routinely (moderate and high hazard dams every two years, low hazard every five years). The commonwealth provides funding for upgrades on all state-owned or state-constructed dams. Upgrading of privately owned structures to state standards has been very successful over the past several years.

The division also administers the Community Assistance Program. We have substantially increased the number of community visits and contacts in the past three years and provided benchmark catalogs for local governments. We continue to provide training workshops on aspects of state floodplain regulations, local ordinance administration, and the National Flood Insurance Program Community Rating System.

We have been involved with several post-disaster mitigation projects, including acquisition and relocation at several sites throughout the state. One such project involved a state declared disaster which did not qualify for a federal declaration. The division surveyed the site and provided floodplain/floodway delineations and benchmark data for the replacement and relocation of about 20 residences. As a result of this event, the state has formed its own disaster recovery team and plan for non-federal declarations.

The most recent effort taken by the division was the forming of a state chapter of the Association of State Floodplain Managers. This is in the early stages of the development of a constitution and bylaws. It is to be called the Kentucky Stormwater and Floodplain Management Association.

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LOUISIANA

Louisiana has a flat landscape crossed by broad river valleys and a 6-million-acre coastal plain. More than half of the state's total area is a geologic floodplain. By the Federal Emergency Management Agency's criteria, 27.4% of the entire state is floodprone—a much higher proportion than any other state. Louisiana ranks first in the nation in number of National Flood Insurance Program (NFIP) claims paid since 1978 (102,529) and has 278 participating communities; 44% of the state's households are in the 100-year floodplain.

Average annual precipitation ranges from 48 to 72 inches. Although floods may occur any time, catastrophic events generally result from summer thunderstorms, slow frontal passage during the winter or spring, and tropical or hurricane rains and/or storm surge. Even 70 miles inland, storm surges can still exceed 13 feet and flood all of the coastal wetlands. Retreat from unprotected coastal communities continues. No one returned to Cheniere Caminada after the catastrophic 1893 hurricane. Manila Village was abandoned after Hurricane Betsy in 1965. Many families moved to Houma from lower Terrebonne Parish after Hurricane Andrew.

Local Floodplain Management

One of the most effective methods of reducing flood damage builds on the expertise and cooperation of local governments. Parishes and municipalities in Louisiana have had the authority to zone and regulate activities since the late 1920s. In 1971 the Louisiana legislature authorized parishes and municipalities to adopt zoning and other land use regulations necessary to comply with the federal flood insurance act. There has been slow but steady progress in the acceptance of flood-resistant building standards, particularly elevation.

Many local governments have initiated flood damage reduction programs. Baton Rouge, for example, recently enacted a comprehensive flood damage prevention program that requires new construction or substantial improvements to (among other criteria)

- be designed or modified and adequately anchored to prevent flotation, collapse, or lateral movement;
- use materials resistant to flood damage;
- minimize or eliminate infiltration of flood waters into sanitary sewage systems or water supply systems;
- meet or exceed each of the following: the lowest floor elevation in a Zone A two feet above the FIRM base flood elevation, two feet above the record inundation, and one foot above the center line of the street and one foot above the top of the nearest upstream or downstream sanitary sewer manhole;
- not use off-site fill material.

The parish's flood damage prevention program and associated activities earned it a rating of 7 under the NFIP's Community Rating System (CRS), enabling its residents to enjoy a substantial decrease in flood insurance premiums.

State-level Floodplain Management

The Floodplain Management Regulations Section is located in the Public Works and Flood Control Directorate of the Department of Transportation and Development. This location provides for active coordination with other sections in the agency, such as the Statewide Flood Control Program, Federal Projects, Flood Control Design and Development, Hydraulics, Dam Safety, and Highway and Bridge Design. This allows for floodplain management input into the design decisions on flood control and bridge projects throughout the state, including developmental standards for areas affected by new and improved structural projects, regulatory standards above and below proposed dams, and bridge embankments in floodplains.

In conjunction with this, floodplain management staff members have served on the Governor's Interagency Task Force on Flood Control and Mitigation, river commission advisory groups, and local community task forces developing more restrictive standards for floodplain development. Staff members have also worked with the state's real estate agents' association, and testified before the state legislature to enact a statewide flood disclosure law. Staff members also perform community assessment contacts for the NFIP, conduct floodplain management workshops, assists communities in the CRS application process, develop publications and brochures, and serve as members of the State Hazard Mitigation Team. The section publishes a quarterly newsletter, the *Louisiana Floodplain Management Factsheet*, with a circulation of about 600.

Levees

Since the early 1700s levees have been Louisiana's first line of defense against floods. State-created levee boards organized local and private flood control systems long before the Corps of Engineers became involved. Today, levee boards manage over 2,200 miles of levees within the state, and there are parish, municipal, and private levees in addition to those. Mainline levees define the west bank of the Mississippi River from Arkansas to Venice and the east bank from Baton Rouge to below Pointe a la Hache. Levees also contain the Atchafalaya River from Old River (about 100 miles inland) to the Gulf of Mexico. Levees have prevented annual flooding on the Mississippi, but they also disrupt natural drainage systems, and keep fresh water and sediment from rejuvenating the state's coastal wetlands.

The extensive levee systems usually keep flood waters and storm surge away from homes and businesses. Pumps discharge precipitation accumulated behind the levees into receiving bodies like lakes, rivers, and bayous. To go along with the levees, New Orleans' drainage system, for example, has over 1,600 miles of canals and drainage pipes, 20 drainage stations, and 89 pumps.

The Louisiana Floodplain Management Association

The Louisiana association (LFMA) has grown to 147 members from state, regional, and local governments, the private sector, and the academic community; it is a chapter of the Association of State Floodplain Managers. The LFMA's strength comes from this diverse membership and its commitment to include all geographic regions and interests in its decisions, operations, and functions. A three-day conference each spring rotates among Louisiana's cities. Awards are presented to *communities* in recognition of actions forwarding flood damage reduction; *businesses* for innovative practices that contribute to lowering flood impacts; *individuals* for exceptional service to the ideals of the LFMA; and a *student* for a flood damage reduction project. In 1995, the LFMA conducted its first regional workshop for parish and municipal floodplain management specialists and others. We believe that an aggressive information program designed and presented by those involved in the day-to-day operations of a local program is one of the most effective ways to reach the many part-time and new floodplain staffs in the small communities.

LFMA members have made presentations on flood damage reduction to the Annual Meeting of the Louisiana Policy Jury Association and other state professional meetings, and have participated in activities of the Association of State Floodplain Managers.

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MAINE

Maine has 5,779 lakes and ponds, 3,500 miles of coastline, and 2,772 square miles of floodplain. Flooding is largely the result of coastal storms, spring runoff, and ice jams. Maine's 500 cities and towns are all "home rule" and most of them function with an annual town meeting at which citizens vote on the town budget and make other policy decisions, such as whether to join the NFIP or amend the floodplain management ordinance. Approximately one-half of the state is "unorganized," and is referred to as LURC territory (Land Use Regulation Commission). It covers about 10 million acres and is owned mostly by paper companies.

National Flood Insurance Program Activity

Maine has better than 90% participation in the NFIP—over 425 communities—most of which joined between 1973 and 1976. All of the unorganized territory is in the NFIP by virtue of LURC's regulations and agreements to review permits in light of the NFIP standards. The floodplain management staff cooperates closely with both LURC staff and that of the Department of Environmental Protection, which has jurisdiction over the water bodies in Maine municipalities. Maine is a relatively low policy count state, with only 5,850 policies in effect, and about $478 million in coverage. In spite of the low numbers, the state has shown a significant interest in the Community Rating System (CRS). Fifteen communities, representing about 31.5% of the state's policy base, have joined the CRS. The estimated premium savings are around $36,600. Repetitive losses are not very prevalent in Maine, but 52 communities do have a total of 172 repetitive loss properties, accounting for 431 claims.

State Floodplain Management Program

Maine's floodplain management program has two full-time staff and one half-time person with two additional staff that serve the program at levels of 40% and 33% of their time, respectively. The program has grown during each of the last three years. Its principal funding comes from the Community Assistance Program. The staff conducts 15-20 community assistance visits per year and 40-45 community assistance contacts. The floodplain management program participates in four flood awareness seminars conducted each spring around the state, with the northernmost being shared with our Canadian neighbors. Over the past three years we also conducted workshops at seven of the 10 chapters of the Maine Society of Professional Land Surveyors and one large workshop for the annual Society meeting. This has resulted in enhanced awareness of all aspects of map determinations.

Code Enforcement Officer Certification

Although recent economic downturns have forced the state legislature to repeal part of the Growth Management Program (which included the state's Comprehensive Planning Program), the Code Enforcement Officer Training and Certification Program survived. It requires that all Maine communities have a state-certified Code Enforcement Officer (CEO). A newly hired CEO has one year to become certified. Maine's Floodplain Management Program became a part of the CEO training system in 1989. A six-hour course, Basic Floodplain Management, is offered in alternate years and as needed, and the state is developing several Advanced Floodplain Management courses for the other years—one to focus on FEMA's new Technical Bulletins. Over 373 individuals benefitted from the workshops in 1993.

Model Ordinance

The Floodplain Management Program provides Maine communities with a model Floodplain Management Ordinance based on their map type. A combined Floodplain and Shoreland Zoning Ordinance is being developed in conjunction with the Coastal Program. Maine's model ordinance includes a 1-foot freeboard standard that can be increased. The staff provided 70 communities with customized ordinances in 1993.

Shoreland Zoning

The legislature has mandated that all communities have Shoreland Zoning Ordinances with minimum setbacks. They range from 25 to 250 feet wide, depending on existing development. If an area is scarcely developed, it is usually zoned "Resource Conservation," and the wider setback is imposed. This ordinance has been a great asset to floodplain management. Frequently the setbacks exceed the floodplain boundaries, so very little new development occurs in the floodplain.

Some NFIP-related standards are incorporated into the shoreland regulations, although there are still significant differences. For example, shoreland zoning bases its substantial improvement definition on the size of the building footprint. But progress is being made in minimizing those differences and developing a combined model ordinance.

Sand Dune Regulations

Maine's sand dune regulations require that all new structures proposed in back dune areas be either moveable or elevated three feet above the base flood elevation and set back beyond the 100-year erosion line for that beach or dune system. The regulations, which are administered by the Department of Environmental Protection but were developed in coordination with our program, prohibit development in frontal dune areas. Maine is one of the few states with a public policy dealing with global warming and sea level rise.

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MARYLAND

Maryland's floodplain authority was originally established in 1933 in an act that followed a series of floods, dam breaks, and periods of drought. Specific regulations implementing a state waterway construction permit for nontidal waterways were promulgated in 1978. Jurisdiction includes the 100-year floodplain based on the assumption of complete fixture build-out in accordance with existing zoning.

The state's floodplain management activities are conducted pursuant to the Maryland Flood Hazard Management Act of 1976. This act established a comprehensive program focused on identification of flood hazards, delineation of floodplains, evaluation of alternatives to address identified problems, planning to avoid exacerbation of flood hazards, and a cost-shared grant program to encourage local jurisdictions to undertake mitigation projects. Due to budgetary constraints, these activities were suspended late in 1991, but partially re-activated to assist local jurisdictions with funding Section 404 Hazard Mitigation Grant Program projects after the severe winter storms of 1994 prompted a disaster declaration. The program is expected to be revived in the event of widespread damaging floods.

The state coordinating office of the National Flood Insurance Program is an integral component of floodplain management in Maryland. All floodprone communities participate and are satisfactorily implementing the requirements of the program. The Community Assistance Program assures sufficient staff to visit every community at least every three years. Larger jurisdictions with permit activity and development pressure are visited more frequently. Communities found to be experiencing problems receive annual followup visits.

Maryland has combined its regulatory programs for nontidal wetlands and nontidal waterways and floodplains. Statutory requirements to avoid first, and then to minimize, nontidal wetland impacts are considered to reduce the pressure to impact floodplains. Floodplain impacts of proposed activities are evaluated as part of the state's authority to regulate and manage water resources. Projects that increase the frequency or magnitude of flooding are prohibited unless the additional area impacted is purchased, placed in flood easement, or otherwise protected through approved mitigation measures.

The Growth Management and Resource Conservation Act was passed in 1992. The act includes provisions related to extra protection for selected sensitive areas, including 100-year floodplains and streams and their buffers. State agencies must certify that state actions are consistent with the Act. The Maryland Department of the Environment administers the state's regulatory programs for nontidal wetlands, waterways and floodplains, dam safety, and tidal wetlands. The Department of Natural Resources contains coastal resources management, shore erosion control, and programs focused on the Chesapeake Bay.

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MASSACHUSETTS

Since 1992, the state Flood Hazard Management Program (FHMP) has visited over 150 communities and made contact with over 200 local building and conservation officials in performing tasks under the Community Assistance Program. Workshops on floodplain management continue to be held for building, engineering, and conservation officials statewide. These workshops cover such topics as flood insurance rating, substantial damage rebuilding requirements, and how to use flood maps and studies. Over 50 local floodplain district zoning ordinances were reviewed for compliance with federal and state regulations as part of the program's tasks. Since 1992, FHMP staff also assisted 15 communities in continuing with or applying for credits under the Community Rating System. The *Handbook for Local Officials for Projects in the Floodplain* was updated and reprinted in 1992. In 1994, the FHMP also updated its program brochure and has begun distributing it widely.

The FHMP continued work it has been doing since 1992 by administering Hazard Mitigation Grant Program funds to 25 applicants for hazard mitigation actions implemented on the local level. Of these 25 applicants, 13 have had projects completed and the grants closed out, including flood protection for two sewage treatment plants, acquisition and removal of structures in a vulnerable coastal dune area, a harbor mitigation plan, and dune restoration.

The FHMP has upgraded some of its computer networking, including establishing an internally shared database for community flood hazard information and activities. The staff also has individual access to Internet electronic mail.

Two of the FHMP's staff currently serve as officers of the New England Floodplain and Stormwater Managers Association, Inc. (NEFSMA), which held three annual meetings from 1992 to 1994. NEFSMA has 90 members, with participation from all six New England states. Its activities included a hydrology/hydraulic modeling workshop in 1993, and cosponsorship of activities at the 1995 Association of State Floodplain Managers conference. The NEFSMA Board of Directors is pursuing an opportunity to utilize U.S. Army Corps of Engineers assistance in developing and holding workshops on a series of technical floodplain management issues.

Staffing patterns since 1992 have held steady. A new NFIP state coordinator was hired mid-year in 1992; one staff member previously funded by FEMA is now funded by the state. Using Hazard Mitigation Grant Program administrative funds, the FHMP hired a part-time administrative assistant, who has been essential in ensuring that the grant program works.

The FHMP is developing a Local Flood Hazard Mitigation Planning Workbook, using Community Assistance Program, state, and Natural Resources Conservation Service funding. The document should be finished in the spring of 1996.

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MICHIGAN

Michigan's Flood Hazard Management Program is based on several state and federal statutes and executive orders. The state regulates the placement of encroachments, including bridges and culverts, in riverine floodplains. State regulations require a hydrologic analysis of flood risk for proposed water-related subdivisions. Flood elevations are established and building requirements imposed to assure that structures will be reasonably free of flooding.

Flood hazard technical services are provided to individuals who are considering buying, selling, building on, or approving construction on any parcel of property throughout the state. The state Flood Hazard Management Plan requires that state agencies take flood hazards into account when planning new facilities, repairing flood-damaged buildings, disposing of land, or approving land use plans. Technical assistance is also provided to individuals and communities by recommending methods, materials, and techniques that will reduce future flood losses.

The basic data for identification and regulation of flood hazard areas are provided by a floodplain delineation study and related maps. Study results are reviewed by the Land and Water Management Division hydrologic engineers to assure that the technical data meet minimum state criteria.

The Michigan Stormwater-Floodplain Association, now in its eighth year, consists of 115 consulting engineers, local elected officials, zoning administrators, building officials, state officials, and university faculty. The Michigan Stormwater-Floodplain Association sponsors topic-specific workshops each year to improve members' familiarity with floodplain issues.

The Flood Hazard Management Unit of the Michigan Department of Natural Resources has been combined with other land-water interface regulatory programs to provide a more unified and responsible organization. This new section has authority in the areas of inland lakes and streams, floodplain control, wetlands, natural rivers, bridges and culverts, and subdivisions. This arrangement has allowed the department to provide a coordinated permitting function. Through close coordination between the various land and water regulatory requirements, permits are issued to support the multi-objective mission of the division.

Recent legislative changes have increased or established permit fees. These funds are specifically set aside for supporting permit staff. This arrangement has allowed the hiring of additional personnel. With this change the Division has been able to disperse floodplain staff to field locations. This allows the staff to concentrate on a smaller geographic area, thereby improving the state-local working relationship, providing better service to citizens and local government to associate the program with a "face," not a disembodied voice.

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MINNESOTA

In the late spring and summer of 1993, Minnesota experienced the major flooding that occurred generally throughout the upper Mississippi River basin. Not since 1969 had disaster struck such a large area of the state. The flood frequency approximated a 100-year event in the upper reaches of the Minnesota River basin, a major tributary to the Mississippi River, and an approximately 20-year event on the Mississippi River in the Minneapolis/St. Paul area. Of the state's 87 counties, 57 were declared Presidential disaster areas. Current estimates are that damage approached $1.7 billion (agriculture, $1.5 billion; public damage, $50 million; and the remaining $150 million in damage to individuals, communities, and businesses).

Approximately 10,000 structures were damaged during this protracted flood. The vast majority experienced basement flooding due to storm sewer back-up without direct surface water flooding. Of those structures damaged by surface water flooding, state and federal mitigation dollars were available to acquire/relocate all substantially damaged structures from willing sellers. The Federal Emergency Management Agency's (FEMA's) Hazard Mitigation Grant Program and other state and federal resources targeted 175 structures for acquisition at a cost of $8 million.

The state has actively participated in post-1993 flood investigations such as the Galloway Report, FEMA's National Mitigation Strategy, and the U.S. Army Corps of Engineer's Floodplain Assessment Study. This involvement, plus the state's dealing with updates to FEMA's Hazard Mitigation Grant Program and newly instituted Flood Mitigation Assistance Grant Program, will aid in the development of the state's pre-disaster, multi-hazard mitigation plan now under development.

Early in 1995, the state participated in a joint National Flood Insurance Program (NFIP) forum with the state of North Dakota. Over 200 insurance agents, lenders, and local officials attended the forum in Fargo, North Dakota, to increase awareness and the policy base of the National Flood Insurance Program (NFIP). As a result of this forum, the state has expanded its efforts to train insurance agents, lenders, and real estate agents about NFIP requirements.

During the last three years, $2.1 million in state Flood Damage Reduction Grants have been awarded to local governments with an equivalent local match.

The Department of Natural Resources recently completed the brochure, "What You Should Know About Buying, Owning or Building a House in a Floodplain." The brochure is in its third printing and final distribution will likely exceed 50,000. The DNR is working with professional organizations to distribute the brochure to insurance agents, lenders, and real estate agents in the state. DNR still distributes its *Water Talk* newsletter to over 2,500 communities, states, and organizations nationwide.

The Department of Natural Resources continues to act as the state coordinating agency for the NFIP, along with coordinating floodplain management activities with other local, state, and federal agencies. NFIP coordination has involved identifying the need for new flood insurance studies and restudies, public information and training, and monitoring and enforcement of NFIP standards. Considerable effort has been directed toward educating local officials and monitoring compliance with NFIP and state standards.

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MISSISSIPPI

Mississippi has the sixth largest percentage of floodprone lands in the United States, accounting for 11,231 square miles of the state's land area, or 24%. Since 1971, Mississippi has had 13 Presidential flood disaster declarations. The Gulf Coast was battered by two major hurricanes within a decade, Camille in 1969 and Frederick in 1979. All but 19 of the state's counties have been included in flood-related Presidential declarations since 1990. At present 265 communities (including 66 counties) participate in the National Flood Insurance Program (NFIP) in Mississippi. Only a few of the identified counties and communities have elected not to participate. Communities with populations as low as 60 participate and administer the NFIP minimum standards.

State coordination for the NFIP is handled by the Mississippi Emergency Management Agency (MEMA). MEMA is a small executive agency consisting of about 43 employees, with programs ranging from hazard mitigation to population protection planning to the review of emergency operations plans for riverboat/dockside casinos. Most of the agency's programs are funded by the Federal Emergency Management Agency and some are funded by the U.S. Environmental Protection Agency. With only one employee, floodplain management pulls its share of the mitigation load.

The primary responsibility of the floodplain management staff, which consists of the NFIP coordinator, is to encourage municipal and county officials to adopt effective floodplain management ordinances in order to reduce flood hazards, prevent loss of life and property, and provide flood insurance to their citizens. Over the last three years, the staff responded to over 500 requests for information about adopting ordinances, completing the biennial reports, developing permit procedures, recordkeeping, processing variances, completing elevation certificates, interpreting special flood hazard boundary maps and flood insurance studies and rate maps, and letters of map amendment. The staff also provided technical assistance to local zoning, building, and planning officials, as well as providing information to lending institutions and insurance agencies.

With dockside gambling, new frontiers of floodplain management have opened up. Tunica County, for example, has grown from one of the bottom 10 counties nationally to a renewed status as one of the top tax-revenue-producing counties in the state. The cost in development pressure for this county has led to the need to declare the Mississippi River, which forms the western boundary of the county, to be a "floodway." This means that each river development proposal must submit a "no rise" certificate demonstrating that the development will not cause a "rise" in the Mississippi River, in addition to obtaining an approved 404 permit from the U.S. Army Corps of Engineers.

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MISSOURI

The State Emergency Management Agency (SEMA) has assumed responsibility for coordination of the National Flood Insurance Program and the Floodplain Administration Program for the State of Missouri. This effort formerly was the province of the Department of Natural Resources. This transfer of responsibility was effective January 1995.

There are 624 floodprone communities in Missouri. SEMA currently has one full-time staff person for floodplain management and is planning to hire two more in the next few months.

SEMA will be preparing a training manual to assist and train local officials in floodplain management. The state is planning to start a state floodplain administrators association.

The state is in the process of buying 4,328 properties in approximately 60 communities that were flooded in 1993. When this project is completed there will be an estimated $200 million savings from future floods over the next 15 years. The current buyout project is approximately two-thirds completed.

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MONTANA

Floodplain management activities carried out by the Department of Natural Resources and Conservation include providing technical assistance to local governments and other state agencies and coordinating activities of the National Flood Insurance Program (NFIP). The Floodplain and Floodway Management Act provides enabling authority for counties and municipalities to adopt floodplain development regulations. It places the responsibility for designating floodplains/floodways and adopting minimum standards for implementing the statutes with the Board of Natural Resources and Conservation. These standards exceed NFIP standards. The department provides model ordinances, helps local governments set up floodplain management programs, and oversees local programs to ensure that the Board's standards are being enforced.

Activities carried out under the Community Assistance Program include publishing a directory of state, local, and federal floodplain management officials, publishing a *Guidebook for Local Floodplain Administrators*, conducting floodplain management workshops for local officials in addition to providing technical and administrative assistance on request, and conducting community assistance visits and contacts.

Montana has been very fortunate in having had no serious flooding since 1986. There have been only a few isolated areas of flooding, and the damage has been relatively minor. Our office is providing technical assistance, providing base flood elevation information if the property owners provide survey data. This has been good public relations for the program, not to mention good floodplain management.

Floodplain management in Montana has been fairly well accepted the last few years. The public is realizing that development in the floodplain should be minimal and wise. This has helped everyone who is involved in floodplain management.

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NEBRASKA

Nebraska's floodplain management program originated in 1967 with the enactment of the Nebraska Flood Plain Regulation Act. The act gave the Nebraska Natural Resources Commission (NNRC) the authority and responsibility to implement a program consisting of floodplain delineation, enforcement of state minimum standards if local government failed to do so, and technical assistance. In 1983, this act was repealed with the passage of the Nebraska Flood Plain Management Act. The Act limited the state's regulatory authority and placed greater emphasis on providing technical assistance to local governments. It also directed the NNRC to accelerate floodplain mapping and assure that state-owned and state-financed facilities complied with floodplain regulations. In 1993, state floodplain permitting authority along designated watercourses was eliminated.

Today, the NNRC is the official state agency for all matters pertaining to floodplain management and is the state coordinating office for the National Flood Insurance Program (NFIP). The floodplain management program is entirely state-funded.

During the past three years the state has had four Presidentially declared disasters; three were flood related. A total of $19.5 million has been allocated to the state under the Federal Emergency Management Agency's (FEMA's) Hazard Mitigation Grant Program, with another $19.7 million coming from the Department of Housing and Urban Development's Community Development Block Grant Program. The floodplain management section has spent a great deal of time technically reviewing and providing comments on projects that have been submitted to the state for funding from these grant programs. These reviews have, in most cases, led to greater coordination and cooperation among state agencies in meeting the objectives of floodplain management.

Considerable effort continues to be spent on providing technical services to communities and providing floodplain information to the public. One innovative way that information is being provided is through the Internet via NNRC's Mosaic home page (http://www.nrc.state.ne.us). The Floodplain Management Section's location provides information on enabling legislation, minimum standards, local floodplain administrators, NFIP mapped communities and a schematic of a 100-year floodplain. This location also provides links to the FEMA home page and index of services.

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NEW HAMPSHIRE

The Office of State Planning (OSP) administers and coordinates the National Flood Insurance Program (NFIP). Within the past eight years the administration of the NFIP has been moved around from the OSP to the Office of Emergency Management (OEM) to the Federal Emergency Management Agency (FEMA) Region 1 Office several times. It is expected to remain at OSP, but all three agencies maintain good communication with regard to the NFIP.

There is one full-time staff member at OSP and one full-time equivalent staff at OEM. These employees offers technical assistance to local officials, lenders, insurers, land surveyors, real estate agents, and the general public. New Hampshire has 178 communities participating out of a total of 234.

Training Locals

Regional training sessions were conducted in cooperation with the Regional Planning Agencies throughout the state in 1994 for local officials and building inspectors. Training sessions are held at least once a year for real estate agents, lenders, insurers and building inspectors throughout the state.

Updating Floodplain Ordinances

OSP has contracted with the Regional Planning Agencies to review at least 90 of the 178 participating communities in FY1995. Each ordinance is reviewed for minimum compliance with the NFIP and the State Floodplain Ordinance. In addition, OSP will be conducting 22 community assistance visits for a combined effort of 112 (63%) floodplain ordinances reviewed in FY1995. OSP proposes to assist all of the participating communities by the end of FY1996.

Publications

In April 1994 the *New Hampshire Flood Insurance Handbook* was published by OSP. This handbook is directed toward local officials and how to administer and enforce the NFIP. It addresses community participation; interpretation, amendment, and revision of FEMA maps; administrative guidelines; construction regulations; coastal areas; and mitigation. The handbook is in a three-ring binder for easy annual updates.

Mapping

Two pilot projects have been established for digital floodplain mapping. The first involved the generation of digital line graphs for two coastal communities. It was funded by FEMA and was completed in accord with the NFIP's *Standards for Digital Flood Insurance Rate Maps*. Floodplain boundaries were automated directly from stable-based mylar source manuscripts, with horizontal control established by the transferral of points from U.S. Geological Survey quadrangles.

The second project is part of one segment of a Department of Transportation transportation corridor study of Route 16, running along the eastern side of the state. The study involves

four regional planning agencies and 38 municipalities. One objective is to generate a digital inventory of available land use and natural resources data.

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NEW JERSEY

Flood Control

Under the Emergency Flood Control Bond Act of 1978, $22 million was provided for matching grants to county and municipal governments to construct flood control projects. Grants have been made to construct 38 projects, of which 35 have been completed. Detailed coordination and design for structural flood control projects in the Green Brook subbasin of the Raritan River and the Passaic River basin, authorized for construction by the Water Resources Act of 1986 (HR-6) has been initiated between the state and the U.S. Army Corps of Engineers. Construction of the Molly Anns Brook Flood Protection Project will begin in June 1995. The Corps and the state are also cooperating on flood control feasibility studies in the Delaware and Raritan river basins.

National Flood Insurance Program

According to New Jersey statute, all construction code enforcement officials must be licensed and satisfactorily complete workshops and seminars developed by Rutgers, the State University, designed to maintain their level of competence. Formal training in flood-resistant construction is provided under this program to code officials to teach them the fundamentals of floodproofing, retrofitting, and flood damage repair, as well as the basic floodplain management requirements of the National Flood Insurance Program (NFIP), because many of these code officials act as local NFIP administrators.

Over the past five years the state has encouraged and actively assisted 50 New Jersey municipalities to apply for and be granted participation in the NFIP Community Rating System (CRS). Six of these municipalities have been granted class 8 status and one has reached class 7. The total annual savings to the approximately 66,000 flood insurance policy holders affected is about $1.8 million.

Flood Hazard Mitigation

Operation and maintenance of the Passaic River Basin Flood Warning System dedicated on August 1, 1988 was returned to the Corps New York District under the provisions of the Water Resources Development Act of 1992. The system was restored, refurbished, and reconfigured under contracts between the Corps, the National Weather Service, and the U.S. Geological Survey, and has been returned to fully operational condition.

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Floodplain Management Section

The section continued to participate in the Federal Emergency Management Agency's (FEMA's) Community Assistance Program, performing about 115 community assistance visits and contacts per year and National Flood Insurance Program (NFIP) workshops for local officials. A newsletter on the NFIP is produced biannually and distributed to 1,400 floodprone communities and other interested parties.

Dam Safety and Flood Control Projects Section

Decreasing resources led to the combining of the Dam Safety and Flood Control Projects Sections into a single section in the spring of 1994. In the past three years staff inspected 467 high-hazard and 338 moderate-hazard dams. Repair work was completed on eight unsafe dams. Applications for 124 permits for dam construction, reconstruction, or repair were reviewed and approved during the period.

While the news media focused national attention on flooding in other parts of the country, damaging flooding continued to occur in New York. In 1993, March snows on top of nearly normal snow packs from earlier in the winter combined to produce flooding that continued well into April. Record and near-record flooding occurred in several river basins. At least six flood-related fatalities were reported. Local flood protection projects were credited with preventing damage estimated at $170 million in 1993 alone. Five reservoirs operated and maintained by the Corps of Engineers within the state were credited with preventing an additional $127 million in damage that year. Through 1994, local flood protection projects have prevented damage totaling more than $1 billion for an investment of $151 million plus the ongoing costs of operation and maintenance.

During the last three years, three new emergency bank protection projects were completed by the Corps with state and local sponsorship. In addition, a new gated control structure at the outlet of Keuka Lake was completed, which will significantly reduce the magnitude and frequency of flooding of shoreline property.

In each of the past three years, staff completed joint annual inspections with the Corps of more than 90 completed projects and continued coordination of 50 or more potential projects.

Several rehabilitation projects were completed during the three years including one to modernize electrical/mechanical control equipment in the largest stormwater pumping station in the state, located in Elmira. The project, costing some $100,000, will substantially extend the reliable operating life of this critical pumping facility.

Coastal Erosion Section

Coastal erosion hazard areas have been officially identified in 44 Great Lakes shoreline municipalities and 39 fronting on the Atlantic Ocean or Long Island Sound, including New York City. To date, 34 municipalities have adopted their own local coastal erosion hazard area management programs. New York's Department of Environmental Conservation has assumed regulatory authority over some 45 non-compliant communities, with only four communities not yet incorporated into the program.

The state regulations restrict new development on such critical coastal features as beaches, dunes, and bluffs. The regulations also require that, where shorelines are receding one foot or

more per year, construction within a 40-year setback zone landward of dunes and bluffs must be designed and built to be relocated farther landward when threatened by the approaching shoreline.

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NORTH DAKOTA

Located in the center of the continent, North Dakota has a population of 638,800. The combined rainshadow effect of the Rocky Mountains and the distance from its main moisture source, the Gulf of Mexico, limit annual precipitation to from 14 to 22 inches (increasing from west to east across the state). The season of highest flood frequency is the spring snowmelt in April.

An estimated 34,000 people reside in identified floodplains. The state experienced flood disasters in 1993, 1994, and 1995. The residual effect of the 1993 summer flood led to the 1994 and 1995 disaster declarations. All three were summer floods, not the historically more common spring snowmelt events.

North Dakota's overall floodplain management efforts are coordinated by the Office of the State Engineer. The 1981 State Floodplain Management Act empowers the State Engineer to undertake floodplain management activities and adopts the National Flood Insurance Program (NFIP) criteria as state law by reference. North Dakota does not have floodplain management criteria more stringent than the NFIP minimum standards.

The State Engineer doubles as Secretary to the State Water Commission (SWC), which routinely handles many types of water development matters. The SWC (which allocates funds) utilizes money from a resources trust fund for cost sharing with local governments on a variety of water development projects. A working relationship exists with cities, county water resource districts, and state and federal agencies with investigation, design, or cost-sharing assistance. Activities funded by state and local sources have addressed the technical aspects of floodplain management, such as hazard identification, mapping, restudies, design, or cost-sharing on project construction. This includes funding of community efforts to build structural flood protection whose goal is to obtain the removal of NFIP floodplain designation.

Despite the long-term progress made by community floodplain management, North Dakota still favors traditional structural approaches to flood problems. Due in part to the nature of the state's flood hazards, structural protection through channelization, levees, or diversions remains the preferred course of action.

North Dakota has 235 communities enrolled in the NFIP, including cities, counties, and townships. Each of these entities has enabling zoning language outlined in state law, which provides the authority on which to base community floodplain management ordinances.

North Dakota has a staff equivalent of 2.5 people working in floodplain management. The floodplain management activities are funded through a combination of state and federal resources. The state participates in the Community Assistance Program; those activities generally focus on educational efforts with communities participating in the NFIP. State-funded activities have generally been concerned with the technical aspects of floodplain management, such as flood hazard identification, mapping, or refinement of the identified hazard. Training new community floodplain administrators is an important ongoing activity because of their rapid turnover. Technical assistance on specific situations or problems that arise in the community administration of a floodplain management program is one of the most valuable services provided by state staff. These requests come daily from both the private and public sectors. As a matter of staff policy, every effort is made to accommodate the multitude of people requesting NFIP map information. Due to ongoing FIRM revisions, annotated maps, and various LOMA and LOMR processes, providing this service is essential. Every year, state floodplain management personnel

conduct visits and contacts with NFIP communities, publish a quarterly newsletter, hold floodplain management workshops, and provide other technical assistance. Mitigation activities will be increasing.

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OHIO

Background

Ohio has over 3,300 named streams and an equal number of unnamed tributaries, averaging one mile of stream for each square mile of land. The state receives an average of 38 inches of precipitation annually. Ohio is exposed to two types of flood-producing storms—frontal and convective. Although flooding can occur throughout the year, most of the large frontal storms have taken place between December and April.

History of Flood Management

Ohio's earliest legislative efforts at flood protection date back to the 1860s with laws requiring the removal of drift timber, authorizing the issuance of bonds for the construction of levees, and providing for special flood relief. In 1914 the Ohio legislature responded to the disastrous 1913 flood by enacting the Ohio Conservancy District Law under which local political subdivisions could be created to organize, plan, and construct flood control works in a comprehensive basin-wide manner. This led to the formation of one of the best-known and oldest locally funded flood protection systems in the nation—the Miami Conservancy District. The District built, operates, and maintains a flood control system consisting of dams, levees, floodwalls, and stream channels without any state or federal funds.

Ohio's early floodplain management laws provided sufficient enabling legislation to allow local governments to undertake floodplain regulation. The philosophy of letting communities "run their own show" with minimal intrusion by the state is embedded in Ohio's Constitution, which states, under the so-called "home rule" clause, that municipalities shall exercise all powers of local self-government not in conflict with state law. Ohio's municipalities are protective of their home rule powers and view with great suspicion any attempts by the legislature to diminish them. Counties, on the other hand, operate under the authorities granted to them by the state.

The Ohio Department of Natural Resources' (ODNR) floodplain management efforts evolved from a focus on providing flood data and coordinating flood control projects in the 1960s to emphasizing land use planning and technical assistance in the 1970s and 1980s. In the early 1970s ODNR undertook a major effort to strengthen its floodplain management activities, but when the state was affected by recessions in the late 1970s and 1980s its floodplain program budget was severely slashed. Only the emergence of the National Flood Insurance Program's (NFIP) State Assistance Program and subsequent Community Assistance Program enabled ODNR to continue providing floodprone communities with a limited level of floodplain management assistance.

In 1989, the ODNR made another try at having floodplain management legislation enacted. The bill passed in late 1990, aided by fresh memories of the disastrous Shadyside flood. The legislation is not as comprehensive as that which failed in the early 1970s. The bill's key provisions include the requirements that any floodplain development funded, financed, or undertaken by a state agency meet state flood protection standards; that state agencies comply with local floodplain management regulations; and that state flood disaster funds be withheld from noncompliant communities (noncompliant communities include floodprone communities that neither participate in the NFIP nor have equivalent regulations). The bill also codified many of ODNR's current floodplain management activities.

Current Program Activities

Ohio's floodplain management program concentrates on providing technical advice and assistance to local governments and to the general public about floods and floodplain management. Administration and enforcement of floodplain management regulations take place at the local level. The 1990 legislation described above expanded the division's floodplain management

responsibilities, which will be fully realized with the filing of administrative rules. This is expected in late 1995.

Modest state funding was received in 1993 to begin implementing a more responsive state floodplain management program while maintaining an active role under the Federal Emergency Management Agency's Community Assistance Program. Staff engineers are receiving more requests from local officials and other state agencies to evaluate site analysis reports and assist with flood study and restudy requests. Staff planners are providing more education and training assistance through the introduction of a regular newsletter, increased workshops and education presentations, and support for the formation of a state floodplain managers association.

National Flood Insurance Program

With 710 identified floodprone communities, Ohio is ranked fifth nationally. Only municipalities and counties (for the unincorporated areas) possess the required authority to participate in the NFIP. Some 608 municipalities and 86 (out of 88) counties have opted to join the NFIP. Virtually all of these communities are in the regular phase of the program. There are an estimated 278,000 properties at flood risk, with a total value of $11 billion. The state has over 22,000 policies in force with a face value of $1.31 billion. Since 1978, 9,655 claims have been paid with a total value of $41.5 million.

The ODNR's Division of Water is the state coordinating agency for the NFIP. Most of the division's floodplain management workload focuses on NFIP-related activities and is supported by funding through the Community Assistance Program cooperative agreements. The division undertakes community assistance visits and contacts, ordinance reviews, Community Rating System assistance, flood loss reduction workshops, a biannual newsletter, and general technical assistance.

Flood Mitigation Assistance

Since 1980, the Division of Water has actively participated in hazard mitigation activities after Presidential flood disaster declarations. As a member of the state hazard mitigation team, the Division of Water staff, in conjunction with the Ohio Emergency Management Agency and other key state agencies, undertakes flood damage surveys and participates in meetings with local officials and flood victims to provide information on floodplain management, federal and state disaster relief, and mitigation programs. Seven hazard mitigation plans were prepared by the Division of Water between 1980 and 1992 in response to major flood disasters.

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OKLAHOMA

The Planning Division of the Oklahoma Water Resources Board guides state floodplain management and coordinates Oklahoma's activities in the National Flood Insurance Program (NFIP). Division personnel provide flood hazard information to communities and assist them in adopting sound floodplain regulations and land use practices. Through a cooperative agreement with the Federal Emergency Management Agency (FEMA), the Board has administered the Community Assistance Program in Oklahoma for 15 years.

Oklahoma has 361 communities currently participating in the NFIP, and last year the Board conducted several meetings to encourage other communities to join. The community assistance visits and contacts were areas of emphasis last year, with 176 visits being conducted. The Board also investigated complaints about construction in floodplains and assisted eight communities with their ordinances.

In September 1994, the Board participated in an NFIP workshop, in conjunction with the Oklahoma Floodplain Management Association (OFMA) annual conference, to acquaint city and county officials with the requirements of the NFIP and its Community Rating System. Oklahoma has 12 communities participating in the CRS. The City of Tulsa recently received the highest CRS rating in the nation, a class 5.

In April 1995, the OFMA held a technical workshop in Tulsa on substantial damage. While at this workshop, Jim LeGrotte presented Ken Morris and Michael Mathis the FEMA Award for Outstanding Public Service in Promoting the NFIP. The OFMA held its fourth annual meeting in September 1994 at Lake Murray Resort in south-central Oklahoma. Over 60 individuals participated. The conference theme was mapping and mitigation. Representatives from Michael Baker, Jr. were guest speakers and informed conference attendees about the new mapping guidelines. Association membership is now over 120.

The Planning Division staff represented the Board at national gatherings and brought back updated information about floodplain management. These meetings included the biennial NFIP Coordinators' Conference in Reston, Virginia, in 1993 and the Association of State Floodplain Managers Conference in Tulsa, Oklahoma, in May 1994.

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OREGON

Oregon's 255 floodprone communities have all adopted floodplain ordinances that meet or exceed standards for participation in the National Flood Insurance Program (NFIP). Oregon also has one of the most stringent land use laws in the country. Together, they go far in mitigating the state's flood hazards.

Oregon's floodplain management program is primarily funded through the Federal Emergency Management Agency's (FEMA's) Community Assistance Program. Federal funding plus the required 25% state match provide for one full-time natural hazards coordinator and a half-time secretary. The program is administered through Oregon's land use planning agency, the Department of Land Conservation and Development (DLCD).

Floodplain management in Oregon is closely tied to the state's highly touted land use law. In brief, every county and incorporated city must adopt a comprehensive land use plan, which is based on 19 statewide planning goals. Goal 7 (natural hazards) states:

> Developments subject to damage or that could result in loss of life, shall not be planned nor located in known areas of natural disasters and hazards without appropriate safeguards. Plans shall be based on an inventory of known areas of natural disasters and hazards.

The task of the natural hazards coordinator is to help local governments mitigate natural hazards through sound land use planning. This includes helping local governments maintain their eligibility in the NFIP.

The land use law also limits development on farm and forest land—much of which coincides with areas subject to flooding. In addition, communities are encouraged to incorporate open space or greenway provisions into their comprehensive plans. There are special coastal provisions as well: dune grading is prohibited without a state-approved management plan, for example.

Additional flood hazard mitigation is provided by the Oregon Building Codes Agency (BCA). The BCA has gone beyond the FEMA minimum standards by requiring lowest floors to be one foot above the base flood elevation.

Although regulatory safeguards go a long way in mitigating flood hazards, the floodplain management program is not without problems. Oregon's principal floodplain management problems are probably similar to those of other states:

- A continuous turnover in local government administrators. Some new administrators are unfamiliar with state and federal regulations pertaining to floodplains.
- In small communities, confusion about who administers the floodplain ordinance at the local level. Some city recorders are unaware of their responsibility.
- Conflicting local, state, and federal programs. For example, some Corps of Engineers 404 permits conflict with Oregon fish habitat enhancement programs.
- Dependence on some FEMA maps that need to be upgraded.

The DLCD is addressing these problems through community assistance visits, workshops, publications, interagency meetings, and active participation in FEMA's Limited Map Maintenance Program.

The state realizes that all floodplain management problems cannot be resolved through regulations alone—nor should they be. An informed and committed citizenry is essential. Continuous education seems to be the key, because conditions—local government officials, agency programs, or the flood hazard itself—are always changing.

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PENNSYLVANIA

Floodplain management responsibilities in Pennsylvania are divided among three state agencies: the Pennsylvania Department of Community Affairs, which coordinates the National Flood Insurance Program (NFIP), and also administers the Pennsylvania Floodplain Management Act; the Department of Environmental Resources, which has responsibility for stormwater management, coastal zone management, and engineering and natural resource concerns; and the Pennsylvania Emergency Management Agency, which handles the state's disaster response effort.

Floodprone municipalities are required by state law to join the NFIP. There are more than 2,300 floodprone municipalities currently participating. Communities that fail to maintain their eligibility in the NFIP are penalized by having all state funds withheld until they regain their good standing in the program.

The Pennsylvania Floodplain Management Act directs the department to provide financial and technical assistance to local governments to help them maintain their eligibility in the NFIP and properly regulate floodplain development. Through its Floodplain Management Division, the department offers training sessions, publications, and a variety of consulting services relating to the preparation and administration of local floodplain management regulations. The department also reimburses municipalities for up to 50% of eligible costs incurred to prepare, enact, administer, and enforce floodplain management regulations.

In addition to meeting the minimum requirements of the NFIP, municipalities must enact more stringent regulations for hospitals, nursing homes, jails, new manufactured home parks, and structures used in the production, supply, or storage of 18 particularly dangerous and hazardous substances.

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RHODE ISLAND

The state responds to inquiries about the National Flood Insurance Program (NFIP). The state continues to monitor how effectively the communities are administering the NFIP requirements. Three communities participate in the Community Rating System.

Rhode Island maintains a statewide dam safety inspection program, and the state continues to regulate development in or on coastlines, sand dunes, and wetlands.

In 1994, an amendment to the Real Estate Disclosure Law was submitted to the General Assembly. The amendment would have required contractors to disclose the floodplain status of any new unoccupied dwelling unit. Unfortunately, the legislation died in committee. With the assistance of the Rhode Island Realtors Association the amended legislation will be revised and submitted for consideration during the 1995 session of the General Assembly.

During 1993 and 1994, approximately 50–75 acres of floodprone land were protected from development by either purchase in fee simple or development rights.

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SOUTH CAROLINA

The South Carolina Water Resources Commission conducts community assistance visits in communities with significant development pressure, serious flooding, high or repetitive flood insurance claims, or other indicators of difficulty with National Flood Insurance Program requirements. A second major activity is the community assistance contact technical assistance meeting to determine which localities should be visited and whether any program-related problems exist. The commission also responds to requests for technical assistance, publishes a quarterly newsletter, and attends the regional meetings each year.

South Carolina Beachfront Management Act

The South Carolina Coastal Council administers the state's Coastal Zone Management Program and the South Carolina Beachfront Management Act. In 1988, the General Assembly passed the SCBMA to limit ill-planned development in beachfront (critical) areas as defined by the Act. A finding of the General Assembly embodied in the legislation is that many miles of the state's 180 miles of coastline are being seriously eroded. Without regulation, development has been unwisely sited in the coastal system that provides a natural barrier from high tides, storm surges, hurricanes, and normal erosion. The Act establishes two beachfront construction zones: a "no build" zone and a "setback" zone. If a structure is destroyed by fire or natural causes, it must be relocated beyond the setback zone or as far landward as possible. The setback zone is based on the area's average annual erosion rate for the past 40 years. Within the setback zone, all activities and/or facilities are subject to state permit. Habitable structures may be permitted within the zone only if they are of 5,000 square feet or less in size. In 1990, amendments to the Act curbed "no-build" zone provisions.

Dam Safety

There are an estimated 2,200 high-hazard dams in South Carolina that directly threaten life and property, and the number increases by one or two every year. Frequently, the increase is due to downstream development and the consequent reclassification of a significant- or low-hazard dam to the high-hazard category as more lives and property are threatened. As South Carolina's population grows, residential development below dams increases. When this occurs, the potential for loss of life and significant property damage becomes greater.

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SOUTH DAKOTA

During the past year South Dakota continued its efforts to mitigate flood hazards through a variety of ongoing programs. The state has begun regulating development in wetlands and along the shores of lakes. Regulations to control erosion are adopted and enforced at the local level. Coordination of activities is maintained between state and federal agencies concerning floodplain management issues and population protection measures. State staff continued to inspect dams statewide to ensure their safety in protecting downstream communities from flooding. The state worked on expanding its flood warning system, including the network of gages for gathering data about stream flow. Communities were advised about design and implementation of warning systems specific to their local conditions.

Although South Dakota does not presently administer National Flood Insurance Program activities (participating communities coordinate directly with the Federal Emergency Management Agency's regional office in Denver) the state's Division of Emergency Management provides information on request and refers localities and individuals to sources of further information.

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TENNESSEE

The Local Planning Assistance Office of the Department of Economic and Community Development maintains a program of technical floodplain management assistance for all cities and counties throughout the state. Included in this program are ordinance assistance, map and ordinance interpretation, permit procedures, and variances, and help with the National Flood Insurance Program Community Rating System.

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TEXAS

The Texas Water Commission, with funding from the Federal Emergency Management Agency, continues to conduct community assistance visits, provide flood ordinance assistance, and conduct local floodplain management workshops and regional Community Rating System seminars. In addition, a quarterly newsletter on floodplain management and flood loss reduction is published and distributed to community floodplain administrators, state legislators, state agencies, and other individuals involved in floodplain management. A *Floodplain Administrators Manual* has been published and distributed.

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UTAH

Although Utah is the second driest state in the nation, it has experienced significant flooding. Utah's 1.7 million inhabitants are clustered in relatively small geographic areas at the base of steep mountain ranges; 90% of the population lives in the Wasatch Front region. Flooding along the Wasatch Front thus affects a relatively small area, but a comparatively large population. Major floods in Utah are almost always the result of rapidly melting snow in late spring and early summer, often intensified by accompanying rain.

Floodplain Management Administration

The Utah Division of Comprehensive Emergency Management, Natural Hazards Section, combines the Community Assistance Program (CAP) with the Earthquake Preparedness Program (EPP) and the Disaster Preparedness Information Program (DPI) to assist local communities in sound mitigation. Utah's continued participation in the CAP during the last three years has proven to be effective in ensuring that 180 communities participating in the National Flood Insurance Program (NFIP) remain compliant and are kept updated on current NFIP issues. The CAP continues to assist local communities in the development and updating of their flood damage prevention ordinances. We also assist them in meeting the requirements of those ordinances and training of their personnel. The Natural Hazards Section provides technical assistance to local governments in both the CAP, earthquake preparedness, disaster preparedness, and pre-hazard mitigation planning.

The Natural Hazards Section has developed a hazard mitigation planning workshop to assist communities in understanding and applying the concept of multi-objective, multi-hazard mitigation planning. The workshop introduces communities to the planning process and all resources available to assist in that process. A workbook was designed to be a "hands-on" guide for the community to be used in identifying the hazards, analyzing them, and determining how best to mitigate them. The mitigation workshop is followed by a half-day workshop that covers floodplain management and the NFIP, lender/agent training in the NFIP, earthquake emergency response planning for schools, and post-disaster assistance and recovery.

The newsletter, *Utah High and Dry*, supplies the state's floodplain administrators with information on various aspects of the NFIP, including proper development documentation, announcements of workshops, and information on new legislation.

State Association

The Utah Floodplain Management Association was formed in 1995 to better address floodplain management issues in the state. This newly formed state chapter of the Association of State Floodplain Managers will be sponsoring conferences, workshops, and other outreach projects to foster floodplain management.

A Greenway Approach

The Virgin River Parkway was dedicated in April 1992. This three-mile stretch of red scenic rock is the first project using Section 404 funding. The area was first inundated after the breach of the Quail Creek Dike, which received a Presidential declaration on New Year's Eve 1989. The parkway is not only a beautiful addition to the landscape, but will also create a safer environment for this small southern Utah community.

Rising Lake Levels

The Great Salt Lake rose 900 square miles between 1963 and 1987, mostly because of the tremendous amounts of snowfall in the late 1970s and early 1980s. In 1993, the Lake had risen to an all-time high of 2,460 square miles, containing 9.6 million gallons of salt water. To control the rising waters, the state invested $55 million to construct a pumping system to allow discharge into

the desert west of Salt Lake City. The pumps ran for 27 months and were able to reduce the water's depth to almost normal. The pumps were instrumental in alleviating the rising waters, and also set precedents for other states with fluctuating water problems.

Wetlands

The state is developing a state wetland policy to stabilize the state's wetlands base (by acreage and function), to restore and create wetlands where feasible, and to increase the quality and quantity of the state's wetland resources. A workbook explaining wetland functions and values, along with regulatory and non-regulatory programs for wetland protection, has been developed by the Utah Division of Wildlife Resources.

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VERMONT

Vermont's Floodplain Management Section consists of one person within the Water Quality Division, funded primarily with Federal Emergency Management Agency Community Assistance Program funds. Work is primarily as spelled out in the annual agreement. Little state-level mapping, land acquisition, or flood control is done.

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VIRGINIA

Floodplain Management responsibilities lie within the Commonwealth's Department of Conservation and Recreation, Division of Soil and Water Conservation. Since 1990 floodplain management and dam safety have functioned operationally within the same Bureau, but there has been ongoing change since 1993. In 1993 the Shoreline Erosion Advisory Service and the Public Beach Board were added to Bureau operations, bringing a dimension of coastal management to Bureau functions. In early 1995 budgets were cut dramatically, leading to the loss of Bureau identity and the splitting of the coastal programs into another operational unit. Currently the floodplain management program and the dam safety program reside in the Bureau of Urban Programs, which historically has been concerned with non-point source pollution control and includes the stormwater management program, and the erosion and sediment control programs.

Virginia's floodplain management program continues to be locally implemented, with no state permit required for floodplain activities. Virginia does, however, have a statewide building code that is required of all communities. Virginia uses the BOCA model code with little modification.

Since 1992 there have been several significant additions or changes. The Chief of the Floodplain Programs Section was named the State Coordinator for the Corps of Engineers Planning Assistance to States Program (Section 22). This move has significantly expanded the use of the PAS program in Virginia. The Tennessee Valley Authority, which essentially filled the role of floodplain management experts in southwest Virginia had devolved its floodplain management program. We continue to coordinate heavily with the Natural Resources Conservation Service, and are making good inroads with the National Park Service.

In the 1995 session of the General Assembly we were able to modify the Flood Prevention and Protection Assistance fund from being a cost-share program for federal projects to being a program that would fund state-local cooperative projects. The commonwealth's Executive Order for floodplain management is undergoing review and the recommended changes to strengthen the language for agency compliance, establish an interagency committee on floodplain management, and restrict the construction of state buildings in floodplains.

In many ways the Virginia program has reached a plateau. However, many of the gains or plans for fixture modification were based on then-existing resource levels. With severe agency budget cuts, and plans that would begin to merge program functions such as stormwater with floodplain management, it will be a challenge to sustain these gains. The next year will be critical to the program as it is redefined and reshaped. The challenge will lie in developing a sound floodplain management mission within the context of fewer resources, and new assignments.

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Flood Control Assistance Account Program

Washington's floodplain management program has as its primary emphasis administration of the Flood Control Assistance Account Program (FCAAP). FCAAP is a state-funded program of $4 million per biennium (2-year period), which involves providing grant funds to local governments. The $4 million is a fixed amount specified in state law that is transferred from the state general fund to the account at the beginning of each biennium. The amount transferred is that which, when added to that remaining in the account from the previous biennium, will bring the total up to $4 million.

Grant funds are made available for developing comprehensive plans for flood damage reduction with 75% state matching funds, constructing flood control maintenance projects with a 50% state match, and performing emergency projects with an 80% state match. Examples of maintenance projects are channel clearing, streambank and levee bank protection against erosion, and maintaining the cross section of levees. Limits of $500,000 for plans and projects and $150,000 for emergency work per biennium per county have been established to help ensure that all counties have the opportunity to compete for the funds.

The administrative costs of running the program are taken from the $4 million fund. A major staff effort is required in working with local governments to develop their applications and administer the comprehensive plan grants. Approximately five people are funded under this program.

This program has been a major impetus for floodplain management in Washington. The availability of state funds sparks the development of comprehensive plans by local governments, which can choose the techniques and methods that best suit the needs of individual river basins or entire counties.

The development of these plans includes the following steps:

(1) Analysis of the flooding problems and flood damage,

(2) Review of alternative solutions,

(3) Impacts of alternatives,

(4) Selection of preferred alternative,

(5) Adoption of plan by local government, and

(6) Implementation of the plan.

Most floodprone areas in western Washington counties have been addressed either with an adopted plan or one in process. Flood damage reduction projects funded through FCAAP are usually implementation measures for comprehensive plans. Statewide, the plans consist of strictly structural approaches, strictly nonstructural approaches, and a combination of the two.

The common structural measures include new levee construction, reconstruction or maintenance of existing levees, streambank stabilization, stream channel maintenance, and setback or overtopping levee construction. Typical nonstructural measures include relocation of floodprone structures, acquisition of floodprone property, elevation/floodproofing of structures, early warning systems, and improved flood hazard area mapping.

National Flood Insurance Program

Of the state's 309 local jurisdictions (including 39 counties), 250 participate in the National Flood Insurance Program (NFIP)—virtually all of the communities with significant flooding problems. Another principal activity is work done under the annual contract with the Federal Emergency Management Agency under the Community Assistance Program. The standard activities eligible for funding under the CAP are performed.

Bioengineering

One relatively new activity in the Washington program that is expected to receive increased emphasis in the next few years is bioengineering—using live plant materials to control erosion along streambanks or levees. Demonstration projects have been constructed and workshops have been presented on bioengineering principles to educate local officials, other agencies, and others on the benefits of the technique. The use of live plant materials as an alternative to rock riprap or other "hard" measures of erosion control yields improved habitat and water quality, enhanced visual impacts, and numerous other benefits.

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WISCONSIN

Background

The Department of Natural Resources (DNR) administers the State Floodplain Management Program and coordinates the National Flood Insurance Program (NFIP) activities. Approximately 14 full-time equivalent staff in the central office (Madison) and six district offices provide technical assistance to local officials, developers, insurance and real estate agents, lenders, and the general public. This assistance covers state and federal minimum standards, model local regulations, guidance on adoption and administration, engineering expertise, and informational and educational materials. There are 565 floodprone communities in Wisconsin.

The Floodplain Management Program and the Dam Safety Programs are combined into the same section. This greatly enhances the ability to tie the use of land below dams to the hazard posed if the dam fails. There are eight staff members in the dam safety unit.

All state agencies are required to insure that all their construction, funding, and permitting actions consider flood hazard standards. Flood hazard mitigation plans have been developed for all state-owned facilities in the 100-year floodplain. Wisconsin Administrative Rule NR 116 requires a zero-rise floodway standard (0.0 feet), zoning below dams, stormwater management, no basements allowed below the 100-year level, and wave runup required along the Great Lakes shoreline. Over 400 community audits have been performed to date to review local administration of floodplain management ordinances and technical assistance needs. Wisconsin also requires two feet of freeboard.

Numerous training and guidance materials have been developed for local communities, including a floodplain/shoreland/wetland management guidebook, a planning and zoning committee handbook, a board of appeals handbook, and a model ordinance to regulate floodplains and combined floodplain/wetland ordinances. The Department is currently working on a mitigation guidebook to guide communities through the floodplain hazard mitigation planning process.

Community Rating System

Ten communities have applied for and received credit under the NFIP Community Rating System (CRS). The state developed a guide for communities applying for CRS credit that provides information about the credit given to Wisconsin communities based on state standards that provide greater flood protection than do the NFIP minimum standards.

Mitigation

The state has mitigation projects in Pierce County, City of Darlington, City of Tomah, Kenosha County, Jefferson County, City of Eau Claire, and Eau Claire County. The state also has an Interagency Hazard Mitigation Team in which DNR floodplain personnel participate. This team coordinates state funding, response, and technical assistance agencies for hazard mitigation projects.

The Federal Emergency Management Agency (FEMA) has obligated over $10.5 million to Wisconsin communities for the voluntary acquisition or floodproofing of floodplain structures. Five communities participate in the program and are responsible for implementation with guidance and oversight provided by FEMA and the state Division of Emergency Government. For the acquisition projects, all structures on acquired properties will be demolished and the land deed restricted as open space in perpetuity. Local communities will retain ownership. Over 170 floodplain property owners are interested in acquisition in the five communities. Most of the 34 offers to owners made so far have been accepted. Closings have been completed on six properties and communities are working with demolition contractors to remove the structures. Floodproofing projects potentially covering about 80 structures in Darlington and Eau Claire County are moving into the implementation phase.

Training Local Officials

Regional training sessions were conducted in 1994 and 1995 for about 400 local zoning officials and planning and zoning committee members. In 1993, the Dam Safety/Floodplain Management Section received the DNR's Division of Enforcement's Recognition Award for its work during the Midwest floods of 1993.

Dam Repair Grant Fund

Since 1990, the state has provided about $9 million for repair or removal of 44 municipally owned dams. Since 1992 the state has also funded the removal of 8-9 dams through the abandoned dam fund. However, this program is no longer operational.

Mapping

The Wisconsin Land Information Association was formed in the 1990 budget bill. A surcharge on the local land transaction fee was enacted in each county. Monies are earmarked for improvements in mapping and, in particular, digital storage of geographic information within each county. As counties develop updates to county maps and geographic information, floodplain zoning maps will be reviewed and revised, if necessary, based on better contour information. Currently, the DNR is working on a county-wide mapping project in Winnebago County. The state does 2-3 studies each year for communities that FEMA is unable to study. DNR also does case-by-case analysis where a detailed study has not been done.

Monitoring Local Communities

The state conducted 10 community assistance visits (CAVs) in 1994 and 12 in 1995. These visits are known as "superCAVs" because they are more extensive than those in the FEMA guidelines. We are spending 150–200 staff hours documenting the data where extensive problems exist in a community—such as where administration of the floodplain ordinance has been lacking. We have developed a 5-year cycle to visit or contact all communities in the state to evaluate their administration of their ordinances. We also conduct 40-60 community assistance contacts each year.

Integrated Databases

We are in the final stage of developing an integrated database for all flood insurance study engineering data, and information about the status of locally adopted ordinances. Enhancement of the system will allow us to verify electronic data previously submitted by Flood Insurance Study contractors and to relate that data to other state information about stream corridors that relates to water resources. This database is made available to localities and their consultants for map revisions.

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WYOMING

Since 1988, the Wyoming Emergency Management Agency has utilized the governor's proclamation of the first full week in April as Wyoming's Hazards Awareness Week. The goals of this program are to protect people and property from hazard-related losses by making information about life-saving and property protection actions available to everyone. Through this program Wyoming also will be reducing its exposure to the financial and legal aftermath of these events.

The Wyoming Emergency Management Agency, the National Weather Service, the Wyoming Department of Criminal Investigation, and the Wyoming State Planning Coordinator's Office are beginning to improve the statewide distribution system for weather warnings. A computer interface between the Department of Criminal Investigation and the NWS allows important weather information, such as warnings, watches, and weather statements, to go directly to a printer or teletype in each county and many cities throughout the state.

A complete revision of the state's Emergency Operation Plan is currently being accomplished. All state agencies are participating.

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