

National Flood Programs in Review—2000



prepared by the

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MISSION STATEMENT

The Association of State Floodplain Managers (ASFPM) supports comprehensive nonstructural and structural management to achieve wise use of the nation's floodplains and related water resources. The ASFPM believes that, through coordinated, well-informed efforts, the public and private sectors can:

- Reduce loss of human life and property damage resulting from flooding,
- Preserve the natural and cultural values of floodplains, and
- Avoid actions that exacerbate flooding.

To help accomplish these goals, the ASFPM fosters communication among those responsible for flood hazard activities, provides technical advice to governments and other entities about proposed actions or policies that will affect flood hazards, and encourages flood hazard research, education, and training.

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Preface

Over the past quarter century the Association of State Floodplain Managers (ASFPM) has participated in the development of a national flood policy that has broadened the programs and tools available to floodplain managers for reducing the traumatic impact of floods in the United States. In addition, the ASFPM has helped develop an increased awareness that the nation's floodplains are critical environmental and cultural resources that need not be the forgotten storm drains that they have become in some places.

Some of the ASFPM's contributions have included the promotion and development of non-structural and floodproofing alternatives, pioneering flood hazard mitigation approaches and strategies, support of a community rating system for flood insurance, long-standing promotion and support of multi-objective planning for floodplains, and advocating the modification of federal policies that inhibit floodplain management or encourage unwise decisions by individuals and government.

Although it is important to review our accomplishments and those of the nation as a whole, we do so only with the recognition that flood losses have continued to escalate, and that recently won gains in floodplain management may be tenuous, and require further "shoring up" to become standard practice.

Based on this need, *National Flood Programs in Review—2000* was prepared by the floodplain management practitioners represented by the ASFPM. Its purpose is to identify those national policies and programs that could be improved to better serve the nation. Based on the status of floodplain management today, we see five priority actions that must be taken if the nation is to effectively meet the challenge of minimizing its flood losses while maximizing its yield of the environmental and cultural resources that floodplains can provide. These actions will be points of focus for the ASFPM over the next several years:

1. Foster responsibility and capability at the individual, local, and state levels.
2. Refine policies, programs, and coordination to build on existing strengths and remedy deficiencies.
3. Assemble and improve the data and tools that are vital to wise floodplain management.
4. Enhance education, training, and public awareness.
5. Assess and evaluate programs so that the appropriate lessons can be learned from them.

Details about these actions are given in the following summary.

NATIONAL FLOOD PROGRAMS IN REVIEW—2000

• SUMMARY •

BACKGROUND

Society at last has couched floodplain management among much wider perspectives of land and resource use and human resiliency than in the past. People are coming to accept both the finite nature and vital importance of water-related ecosystems to the sustainability of human communities, and they are slowly altering their behavior to coincide with that realization. Much progress has been made in the past decade to ensure that the management of floodplains in the United States also reflects this broader outlook. A more balanced approach now is supported by federal and state agencies alike. There is a recognition that the many aspects of flooding and its management are interconnected and that we cannot address them as though they exist in a vacuum. Links thus are beginning to be forged among the concerns of water quality, habitat protection, land use, insurance, cultural and historical preservation, economic development, disaster preparedness, stormwater management, and many others. Likewise, the nation is beginning to adopt a multi-hazard approach where appropriate, so that planning and prevention measures for floods, earthquakes, hurricanes, tornadoes, and other hazards do not take place in isolation from each other.

But to be effective at maintaining this holistic approach in the future, floodplain management must become an integral component of society's approach to living with and cooperating with its environment—rather than trying to control it. The ASFPM envision a sustainable future—one in which floodplains throughout the nation are used only in ways that protect their integrity as enduring ecological systems. This would keep flood losses to a minimum; make economic sense for many generations to come, not just in the short run; would avoid fostering social inequities; and be both a source and a product of local pride, ownership, and responsibility.

The mechanics of reaching and maintaining this vision will include a robust program of mitigation at all levels of government and the private sector. It will require acceptance of more personal responsibility by the public; incorporation of floodplain management in all aspects of land use planning and development; and the availability of qualified (certified) floodplain managers in every National Flood Insurance Program community. Hazard awareness will need to be incorporated into all elementary and secondary school curricula; support will be needed for college students who want a career in floodplain management. Digital elevation models and other accurate and dynamic floodplain mapping tools will need to be developed. Doubtless, the need for many, many other potential activities, strategies, and shifts in thinking will become evident as progress is made.

A CALL TO ACTION

In considering how best to reach a reality that includes sustainable floodplains, the ASFPM generated a list of changes we believe are fundamental to moving forward. Making such changes will involve many challenges, obstacles, and opportunities. The ASFPM sees five principal needs: (1) increased individual, local, and state responsibility and capability; (2) adjustments to programs and policy; (3) improved quality and quantity of flood-related data and access to it; (4) education, training, and public awareness of floods and floodplains; and (5) evaluation of programs to date. These important needs and some actions to implement them are explained below.

1. FOSTER RESPONSIBILITY AND CAPABILITY AT INDIVIDUAL, LOCAL, AND STATE LEVELS

Incentives (technical, financial, and other) need to be developed at the state and federal levels to encourage communities and individuals to adopt a longer-term, sustainable approach to floodplains, and to undertake comprehensive mitigation activities. Unfortunately, the strong role adopted by the federal government in certain situations in the past (like disaster relief) may have unwittingly encouraged the perception on the part of individuals—as well as state and local governments—that they need not make floodplain management their own priority. The following remedial steps need to be taken.

- Incentives to appropriate action should be built into all possible public and private programs for technical and financial assistance.
 - (a) For individuals, federal financial assistance for flood losses should be based upon the individual's demonstrated willingness to mitigate the risk. The ASFPM believes that flood insurance is the best means of accomplishing this. For example, those living in identified flood hazard areas should not receive financial assistance if a flood insurance policy was not in place at the time of the flood. Additional mitigation grants should be made available to policyholders who take steps to mitigate their flood risk. The premiums on structures with repetitive losses and on those that are not primary residences should reflect the actual risk.
 - (b) For farmers, federal incentives and programs like the Conservation Reserve Program, the Wetlands Reserve Program, and permanent easements are vital financial assistance in the development of sustainable uses for floodprone lands. Agricultural losses constitute over half the flood damage paid for by taxpayers—amounting to billions of dollars. The trend of heavy government support, such as highly subsidized crop insurance and flood disaster payments on floodprone lands, is neither sustainable nor reasonable, especially for marginal agricultural lands that flood frequently. In addition to major losses from flooding, farming marginal land leads to pesticides, herbicides, fertilizers, and sediment polluting the nation's waters, and the resultant loss of valuable riparian ecosystems. Such uses are not sustainable. Agricultural properties subject to repetitive flooding should be denied subsidized insurance and flood disaster payments if their owners refuse offers to purchase permanent easements.
 - (c) For states and localities, programs for flood control structures, nonstructural flood measures, mitigation, and flood disaster assistance should all be based on the same, sliding cost-sharing formula for federal assistance. Under this concept, a minimum cost-share would be made available to all localities but the federal share would be increased for communities and states that engage in disaster-resistant activities exceeding minimum criteria and that are implementing strong mitigation programs. After a flood disaster, Public Assistance under the Stafford Act should be withheld from the damaged floodplain areas of communities not enrolled in (or not in compliance with) the National Flood Insurance Program. The “managing state” concept initiated by the Federal Emergency Management Agency should be used as an incentive to state involvement in and commitment to mitigation, and be expanded to other programs beyond the Hazard Mitigation Grant Program.
 - (d) All taxpayer-funded flood disaster relief should be contingent upon taking flood mitigation action.

- The roles, responsibilities, and capabilities of the public, the various levels of government, and the private sector should be clarified and strengthened. Citizens, businesses, and local and state legislators need to better understand that the federal government will not always bail them out after a flood. They must bear their fair share of the risk.
 - (a) The optimal federal role would be (1) leadership, including appropriate laws and executive orders; (2) maintaining solid data, including maps, stream gages, forecasts, flood damage data, and watershed studies; (3) providing flood insurance and associated mechanisms; and (4) wielding appropriate incentives and consequences to encourage individuals, communities, states, and the private sector to take appropriate actions and decisions to reduce flood losses. Federal agencies must see their role not as “doing” the planning and implementation of projects, but as facilitators to the development of state and local capability and programs.
 - (b) The role of the state government is to provide, as necessary, policy development, technical assistance to communities, coordination, and prioritization and integration of floodplain management issues within that state. States should develop, fund, and implement adequate technical and financial assistance efforts in order to provide adequate help in building strong local programs, and to meet the other goals noted above. These state programs should include, but not be limited to, ongoing coordination of National Flood Insurance Program activities within each state. States thus should come to view the Community Assistance Program only as an auxiliary funding source; and the Community Assistance Program itself should encourage less oversight and more long-range planning and mitigation initiatives.

In the future, states should expect to help their communities incorporate floodplain management into other community processes. States should combine resources for disaster response by joining existing regional emergency compacts. Qualified states should perform and administer floodplain mapping programs for the Federal Emergency Management Agency, administer the Hazard Mitigation Grant Program and the Flood Mitigation Assistance Program, and conduct environmental reviews for mitigation projects. States and communities should be encouraged to develop the capability to do their own engineering studies and reviews, such as reviewing Letters of Map Revision submissions. Incentives are needed for states to develop strong dam safety initiatives and integrate them with their flood hazard programs.

- (c) Local governments must become the focus of hazard mitigation efforts. Using comprehensive local plans that consider the entire watershed and address multiple community issues and concerns is the best way to promote appropriate use of floodprone lands. Local governments need to better integrate floodplain management regulations into their overall land use and development plans. Mitigation funds should not be available to a locality unless it has in place a comprehensive mitigation plan. Communities must be provided with the tools, responsibility, rewards, and a workable process through which they can move toward sustainable floodplain management. The participation of their citizens, the private sector, and non-governmental organizations is necessary to achieve disaster-resistant communities; the Federal Emergency Management Agency's Project Impact initiative is helping selected communities become models of this kind of integrated, multi-hazard, holistic approach. The successful activities of communities that participate in the Community Rating System of the National Flood Insurance Program should be publicized and shared.

2. REFINE POLICIES, PROGRAMS, AND COORDINATION

Numerous federal and state laws, policies, and programs are in place to help manage the nation's floodplains, but not all of them operate effectively. In addition, some primary links are missing. Improved overall direction can be set, in large part, by the shifts described below.

- A National Floodplain Management Policy should be established. It should include a national riparian zone policy of protecting, maintaining, and restoring riverine areas in order to preserve them as sustainable ecosystems for future generations. Buffer zones along rivers, streams, and smaller waterways need to be encouraged. The Continuous Conservation Reserve Program could be converted to a permanent nationwide easement program for riparian buffers. Emphasis should be placed on maintaining the natural flood storage capacity within all watersheds.
- A coordinated, watershed-based, multi-objective approach for all water resource activities must be adopted. It should include coordination with water quality improvement efforts, the creation and maintenance of upland storage, and coordinated planning among upstream, downstream, rural, and urbanized localities within the same watershed.
- Systemic biases need to be removed from program guidelines and benefit/cost analyses so that nonstructural alternatives can move forward on their own merits. The benefits of proposed nonstructural projects must be calculated in the same way as those of structural projects—to include avoided damage as an additional benefit. Land and easements should be considered part of the total project cost, not a local sponsor requirement.
- National standards should be developed for the design and placement of infrastructure to avoid damage from flooding and other hazards.
- Better methods for quantifying the economic benefits of natural and cultural resources must be developed, adopted, and applied.
- A water resources coordinating mechanism needs to be re-established at a high level within the federal government. It could include responsibility for the Unified National Program for Floodplain Management, and have oversight to ensure that all federal policies and programs are supportive of the National Flood Insurance Program. Upgraded Executive Orders or other measures are needed; they should tie flood disaster relief and other federal funds to a community's participation in and compliance with the National Flood Insurance Program, as well as to the maintenance of flood insurance.
- Several regulatory standards of the National Flood Insurance Program should be strengthened. The ASFPM believes that the three most critical needs are for a no-rise floodway with no impact on water surface or velocity; freeboard above the base flood elevation to the lowest floor; and clear standards and procedures for determining when a structure is deemed to be “substantially” damaged or improved, thereby triggering both a requirement that it be upgraded to be flood-resistant and also eligibility for financial assistance to do so. It is recommended that these latter standards include assessing improvements and damage cumulatively over time, and using the market value to evaluate the threshold for what constitutes “substantial.”

- To avoid catastrophic damage, new structural measures should be built to protect to a flood greater than the 1% chance event—the 0.2% chance flood is recommended as a standard.
- The Hazard Mitigation Grant Program's review and approval process is greatly improved under the Federal Emergency Management Agency's “managing state” concept and in general. The ASFPM urges the Federal Emergency Management Agency to continue to improve and streamline this process, delegating as much as possible to the states, so federal expertise and funds can be used more efficiently.
- Generous and reliable funding is needed for programs that have the most promise for long-term impact. These include technical assistance programs like the U.S. Army Corps of Engineers’ Flood Plain Management Services and its Planning Assistance to States Program; mitigation initiatives like the Flood Mitigation Assistance Program; and programs to purchase permanent easements like the Natural Resources Conservation Service’s Wetland Reserve and Emergency Watershed Protection programs. In addition, the Administration should ask Congress to declare Flood Mitigation Assistance funds to be non-federal, because they are non-tax dollars.
- Some modifications to the insurance aspects of the National Flood Insurance Program would enable it to better support flood loss reduction. These changes include improving the Increased Cost of Compliance eligibility and funding provisions so that more damaged structures are mitigated with assistance from individual flood insurance policies; finding ways to move toward actuarial rates for policies on repeatedly flooded structures; finding new methods to determine flood risk for insurance purposes so that information useful for community planning and floodplain management can be left on flood maps; and providing an insurance policy benefit for coastal erosion and mudslides only where those hazards are clearly mapped and regulated. The ASFPM believes that this can be done at a net savings to the National Flood Insurance Program.

3. ASSEMBLE AND IMPROVE NECESSARY DATA AND TOOLS

One area in which the ASFPM believes federal leadership and resources are paramount is in the collection, development, and maintenance of many types of comprehensive data. We believe that this is an appropriate federal role because it relates to the federal interest in and responsibility for interstate commerce, and in the prevention of future disasters and minimization of federal disaster costs. There is a desperate need for comprehensive, accessible flood damage data—both historical data and the sort that is gathered immediately after floods. One of the reasons that sweeping evaluations are needed today (see below) is that relevant data has not been gathered and catalogued systematically all along.

- Additional funding for map programs (including the Federal Emergency Management Agency’s Mapping Modernization Plan) is crucial.
- Accurate data on the location and number of floodprone structures throughout the nation must be collected and made readily available.
- The accuracy and ready availability should be ensured—preferably through a national database—of (1) the information on flood-damaged structures that is already collected by federal agencies, contractors, and others; (2) National Flood Insurance Program claims information, including location of the insured property, amounts of claims payments, and value of the property; and (3)

data on repetitive loss structures, including the risk and reason for flooding of each structure. There are several ways to do this. For example, localities could be required to identify the number and risk of structures within their jurisdictions as part of a local mitigation plan done under the Flood Mitigation Assistance Program or the Hazard Mitigation Grant Program.

- Adequate funding should be provided for initiatives that support all aspects of floodplain management, including data collection, forecasting, geographic information systems, mapping, scientific research, and analysis.
- A critical network of national stream gages must be specified and federally funded. The information from these gages, along with associated data, is baseline information that should be collected and maintained by the federal government, because the whole nation uses it for warnings and risk identification and all taxpayers benefit.
- Flood hazard maps should be developed that depict all related hazards, for example, the failure zones of all dams, levees, and floodwalls. Not only is this identification important for notification and warning purposes, but also development in these zones should have added flood protection, and flood insurance should be mandatory, with rates based on the residual risk.
- Flood maps should be based on future-conditions hydrology except in areas where no increase in post-development runoff is allowed. This will reduce the cost of remapping, minimize future damage, and improve sustainability.
- The Technical Mapping Advisory Council should continue to provide guidance on implementing the Mapping Modernization Plan of the Federal Emergency Management Agency. Consideration should be given to basing flood maps on future-conditions hydrology; developing a process to map developing areas quickly; requiring developers to perform the necessary engineering studies for large developments; and identifying other hazard areas on the flood maps.
- Fill should be treated like any other engineered foundation, so Letters of Map Revision should not be issued based solely on fill, which often results in structures on “islands” that are inaccessible during flooding. When there is a need to waive flood insurance, the Federal Emergency Management Agency should issue a letter of flood insurance waiver based on the structure’s being above the 1% chance flood elevation, but not remove the entire property from the mapped floodplain.
- Developers sometimes seek to go beyond waiving flood insurance and remove the “floodplain” designation from a property, and then develop that property with basements or in other ways that would not be possible on floodplain lands. Removing the designation of “floodplain” from a property on an accurate floodplain map should be contingent on (1) waiving future flood disaster assistance for 1% chance or smaller floods, and (2) requiring waivers to be recorded on the property deed.

4. ENHANCE EDUCATION, TRAINING, AND PUBLIC AWARENESS

The sustainable use of the nation's floodplains can only be achieved at the hands of an educated cadre of professionals from various fields. The principles of sustainability themselves will need to be brought into sharper focus as they apply to floodplain management, and as they pertain to the public at large.

- Encouragement and support should be given by federal agencies and states to professional certification programs for floodplain managers, adjusters, agents, and others.
- Better ways need to be found to convey to the public the uncertainties associated with weather and flood forecasts, and to help people understand their risk and take appropriate action to prepare for and avoid such hazards.
- Specific information about, and techniques for, sustainable floodplain management need to be catalogued, documented, and built into the appropriate curricula of universities, elementary and secondary schools, training facilities, and programs for the continuing education of professionals.
- We must find clearer ways to communicate flood risk so that it is meaningful to citizens and communities, thus enabling them to take appropriate steps to reduce risk and damage. The confusing terminology "100-year floodplain" should be abandoned in favor of language that is more understandable to the layperson. The ASFPM suggests using "1% chance flood." As an alternative, the broader terms "high-risk flood" could be used for the 100-year flood and "moderate-risk flood" when referring to the 500-year event.

5. ASSESS AND EVALUATE PROGRAMS

The most pressing deficiency in our nation's flood loss approach is the failure to stop periodically and conduct a rigorous questioning of the value of what has been done already and what its effects have been. There needs to be an independently conducted, comprehensive assessment of the effects of policies and programs in force—particularly the National Flood Insurance Program—on both quantity and quality of floodplain occupancy throughout the United States. Are our efforts reducing overall vulnerability to floods? To shape a more productive future, we need to have in hand a full and true understanding of the effectiveness of the loss reduction programs and activities undertaken to date. To move too far without such knowledge and understanding could well exacerbate rather than improve our situation.

- The National Flood Insurance Program must be thoroughly evaluated. An assessment of its effects on resource use, economics, and occupancy of the floodplain should be done before reforms are undertaken.
- The *Principles and Guidelines* and the National Economic Development standard need to be reviewed and refined, to make them consistent with the elements of sustainability.
- The Hazard Mitigation Grant Program and the Flood Mitigation Assistance Program should be evaluated, to determine whether the measures they fund are reducing losses and protecting floodplain resources when both the entire watershed, and the long term, are considered.

- Periodic reviews also should be done of state and local floodplain management policies and programs, to identify what successes have been achieved in certain states and locales, what contributed to that success, and how they could be duplicated elsewhere in the nation.
- The status of all the nation’s flood control structures needs to be assessed. Plans should then be made for a comprehensive program of maintenance, inspection, replacement, or removal, as warranted.
- A multi-agency review and an independent scientific assessment should be undertaken of the risk-based analysis now being used to determine the feasibility of some structural projects.
- The impact of ranching and farming on floodplain resources and flood problems needs to be systematically assessed.

CONCLUSION

These five areas of needed action, and the recommendations that flow from them, are those the ASFPM believes to be crucial to progress toward sustainable communities, and a sustainable nation. Implementation of these recommendations will help us all cultivate a holistic perspective, spread responsibility more equitably, and foster sensible attitudes toward the use of hazardous and environmentally sensitive lands. These action items will be the focus of ASFPM effort over the next five years or so, in our work with state and local governments, federal agencies, the insurance industry, individual professionals in floodplain management, Congress, and our many other colleagues and partners in both the public and private sectors.

The ideas and recommendations offered in this Summary are just the highlights of a more comprehensive report, *National Flood Programs in Review—2000*, which describes and documents many more aspects of floodplain management today, and makes recommendations for further action as appropriate. The full report can be obtained by calling the Executive Office of the Association of State Floodplain Managers at (608) 274-0123, or by accessing the ASFPM's website at www.floods.org.

Sources of More Information

The following websites offer more information about floods, floodplain management, and sustainability.

Website of the Association of State Floodplain Managers, Inc. www.floods.org
 Website of the Federal Emergency Management Agency www.fema.gov
 Website of the Natural Hazards Research and Applications
 Information Center www.colorado.edu/hazards
 Websites of individual states

NATIONAL FLOOD PROGRAMS IN REVIEW—2000

BACKGROUND

The flood loss reduction policies of the United States were initially crafted a century ago in recognition of a federal role in flood protection, and were modified after devastating floods in the 1920s and 1930s. The policy at that time was founded on a popular belief in human ability to control nature through technological advances and through the strength of the federal government. In the late 1950s and 1960s it was recognized that federal programs could not possibly control all floods, and that management of both floodprone lands—and human occupancy of them—was necessary.

Although it was not broadly embraced at the time, the conceptual framework of these policy changes emanated from Gilbert F. White's dissertation, *Human Adjustment to Floods*, published in 1945. This ground-breaking work was the first to suggest a multi-pronged strategy for the management of flood losses. Several states were implementing floodplain management initiatives at the time, but the first federal application was made by the Tennessee Valley Authority through the work of James Goddard in the 1950s. Between the academic foundation laid by White and the applications pursued by Goddard and a handful of floodplain management practitioners, lessons were learned that allowed for the crafting of a new means of managing flood losses.

During the 1950s and early 1960s, however, mainstream federal policy continued to promote a strong federal lead in the control of floods along with increased post-disaster benefits, such that there was very little incentive for local or state governments to worry about managing flood hazards.

With the establishment of the National Flood Insurance Program in 1968, the relationship between the federal government and state and local governments was altered. From that point forward it was recognized that escalating disaster costs must be controlled and that flood protection was not simply the responsibility of the federal government. Through flood insurance, those at risk began to bear a larger share of the costs associated with flooding. The National Flood Insurance Program also served as a mechanism to bring the responsibility for floodplain management to the states and communities of the nation.

From the late 1960s to the early 1990s, modest advancements in a balanced floodplain management strategy were made. These included reforms to the National Flood Insurance Program that included the mandatory purchase of insurance provisions (this led to most communities' adopting floodplain management standards), revisions to federal cost-sharing that placed more funding responsibility on project sponsors, and the establishment of the Hazard Mitigation Grant Program in the Federal Emergency Management Agency. In addition to these visible policy changes was the development of the *Unified National Program for Floodplain Management*, initiated by the Water Resources Council and later transferred to a Federal Interagency Task Force on Floodplain Management, chaired by the Federal Emergency Management Agency. The work of the Water Resources Council and Task Force led to the broadening of floodplain management tools and concepts to include such techniques as floodproofing, the concept that floodplain management has a dual purpose—loss reduction and the management of natural and beneficial floodplain functions—and promotion of multi-objective planning strategies.

The 1993 Midwest floods brought a renewed sense of urgency to floodplain management and a shift in focus on the part of the federal government. The magnitude of those floods prompted the White House to take intense interest in coordinating the recovery. The Administration became receptive to the advancement of a comprehensive and balanced floodplain management policy. Agencies, in particular the Federal Emergency Management Agency, were provided with greater flexibility to orchestrate a recovery premised on relocating people and towns out of the floodplains. Legislative changes moved quickly through Congress and the Administration to lay the foundation for more aggressive disaster mitigation programs.

In addition, the White House directed an interagency process for more reasonable levee restoration and established the Administration's Interagency Floodplain Management Review Committee, which was charged with conducting a comprehensive review of floodplain management. The committee was led by Gerald E. Galloway, Jr.. Its 1994 report, *Sharing the Challenge—Floodplain Management into the 21st Century*, (sometimes referred to as the "Galloway Report") (available at http://fedbbs.access.gpo.gov/lib/wh_flood.htm), emphasized that the responsibility and accountability for floodplain management must be shared among federal, state, and local governments as well as the citizens of the nation. It specifically called upon state and local jurisdictions to refrain from putting people and property at risk, first by avoiding development in the floodplain; second, by moving those at risk out of the floodplain, when appropriate; and third, by treating the floodplain as part of a physical and biological system within the larger context of its watershed.

The first significant update of the National Flood Insurance Program followed soon after the publication of the *Sharing the Challenge*, with the passage by Congress of the National Flood Insurance Reform Act of 1994 (P.L. 103-325). The passage of the act was accompanied by a number of shifts in policy and focus among federal programs. The Midwest flood recovery, albeit far from perfect, was revolutionary in terms of federal effort, and because of this proceeded with a sense of vision, urgency, and purpose.

Meanwhile, up until the 1993 floods, a remnant of the Water Resources Council had been nurtured by the federal Interagency Task Force on Floodplain Management. The Task Force was staffed by senior career personnel from various agencies, had produced over the years the several updates to the *Unified National Program for Floodplain Management*, published *Floodplain Management in the United States: An Assessment Report*, and supported the advancement of many key floodplain management tools and concepts, such as multi-objective planning, floodproofing, and the conservation of natural and beneficial floodplain functions. Equally important, the Task Force understood that the way to improve floodplain management was through the development of state and local capability and the shifting of "assumed" responsibility for mitigating and controlling flood damage from the federal level to local and state governments. For several years, the Task Force was the focal point for agency staff to meet, resolve conflicts, pool resources, and be the "keepers of the flame" for the advancement of a coordinated (federal/state/local/private) floodplain management policy. While at times this group appeared to be impotent in the vast power structure of Washington politics, it was effective at bringing focus to pressing issues.

In spite of the momentum at the federal level after the Midwest floods, the politics surrounding floodplain management quickly became more complicated. While Galloway and his team were working on their conclusions, interested press and others awaited the results with high anticipation. The environmental community was particularly expectant, because for the first time in such a high-level document, the concept of leaving floodplains in an undisturbed state was being seriously discussed. Unfortunately, when it was officially released, *Sharing the Challenge's* sensible, balanced

approach to floodplain management, which had appeared to be receiving bipartisan support in Congress, was portrayed in the press as a “greening of the floodplains,” and as an environmental protection and restoration initiative. Further, both its premises and recommendations ran counter to the short-sighted economics-based decisionmaking tools in wide use then and today. Because of the spin put on the report by the media, support was lost, and rapid and widespread endorsement of the report of the Galloway task force was doomed.

This new political “opposition” caused many of the far-reaching initiatives of the Clinton Administration to be withdrawn by the White House for continued study and development, and follow-up since then has been relatively sporadic. An added misfortune was that the well-intentioned moves of the Administration early in the Midwest recovery in essence usurped the toehold on advancing floodplain management that the Interagency Task Force on Floodplain Management had maintained up to the 1993 floods. To further compound this problem, there simultaneously was a dramatic turnover in agency personnel serving on the Task Force and in both appointed and career staff within the Office of Management and Budget and the Council on Environmental Quality. This resulted in the serious diminution of institutional knowledge and experience in floodplain policy at the federal level, and thereby created a vacuum in federal oversight, coordination, and leadership.

The years since the Midwest flood have seen numerous other major flood disasters as well as devastating hurricanes, and Congress has broadened to some extent its perspective on flood risk and losses. Too often, however, it still views flood damage reduction from a “projects” perspective—federal dollars spent locally and not nearly enough to promote wise floodplain and natural resource management. The results of this near-sighted approach are often more—not less—at-risk floodplain development, rising disaster costs, and deterioration of river and stream ecosystems that then also require increased expenditures for treatment and restoration.

Although floodplain management works best when it is implemented at the local level, states and localities cannot reduce flood losses in the absence of federal leadership and guidance. If we, as a nation, are to diminish the adverse consequences of floodplain development, the federal government must continue to broaden its approach. Federal agencies must act as facilitators—rather than problem solvers—in the process of developing solutions to flood problems. The ultimate federal role should be that of developing and implementing programs and policies that encourage state and local governments to take actions that both reduce future federal disaster payments and support the nation’s environmental and economic goals. The appropriate role of the state government is to provide, as necessary, policy development, resources, technical assistance to communities, coordination, and prioritization of floodplain management issues within that state.

The solution to escalating flood damage and loss of floodplain resources is a coordinated national policy, with a transfer of assumed responsibility from the federal government to the local and state levels. Today some federal programs are being modified in a manner that ignores the state role, or are being set up to provide direct services to local governments with little thought of establishing incentives to build capability or encourage responsibility. As pointed out in this document, state-level capability is diminishing, and local capability is inconsistent and limited. Losses from floods cannot be reduced if these trends are left unchecked. Although many advances have been made, the Association of State Floodplain Managers (ASFPM) is concerned that if we do not renew our efforts to institutionalize coordination among all levels of government and to solidify local capability, then the hard-won advances in the field of floodplain management will be lost rapidly. In that event, the cost to the nation will be extreme.

Like other domestic policies, flood protection programs are shaped by the events and policies of a previous era. As citizen expectations, technology, and economics change, national policies must adjust accordingly. Significant new social realities are making additional adjustments in floodplain management necessary. These new trends include an appreciation of the natural environment, recognition of the inherent risk of living in floodprone areas (with or without flood control structures), a growing impatience on the part of society to continuously bail out those who choose to live at risk, and reductions in federal spending that minimize the number of large, single-purpose programs and make it essential to integrate numerous smaller programs in order to resolve flood problems. Another trend is an acceptance of sharing roles in flood loss reduction among all levels of government and the private sector. But because this concept is widely accepted but scarcely institutionalized, ways need to be found, within the existing framework, to spread responsibility more widely. A final shift in recent thinking is that today's generations are beginning to shoulder responsibility for leaving natural resources and healthy ecosystems for the generations of the future.

Five years ago, the ASFPM prepared *National Flood Programs in Review 1994*, the first comprehensive effort on the part of the ASFPM to assess national programs and policy related to floodplain management. The purpose of that document was to provide input for the Galloway-led task force, and many of the issues identified in *National Flood Programs in Review 1994* in fact were included in *Sharing the Challenge*. Now, as we now move into the new millennium, it is time once again to evaluate the status of our national approach to floodplain management.

The appraisals and recommendations in this report represent the cumulative experiences of floodplain managers nationwide. As the nation's leading organized voice for floodplain management, the ASFPM offers this status report of important adjustments needed in national flood protection programs and policy for the near future.

SUSTAINABILITY, DISASTER RESILIENCE, AND MITIGATION

Among floodplain managers, planners, environmentalists, and local officials there has emerged over the last several years an awareness of the benefits of protecting the natural functions of floodplains as a means of both protecting property from flood losses and preserving natural ecosystems. This attitude is part of a broader movement toward using the criteria of "sustainability" in development, economic decisionmaking, and resource use. Sustainability is already a widely used concept in the international development arena and one that is rapidly gaining recognition as a guiding principle for community development in the United States. Many countries, in addition to the United States, as well as state, regional, and local governments and environmental and nonprofit organizations, have embraced this ideal and are currently evaluating growth, development, and economic policies with the goal of ensuring sustainability.

Sustainable development, broadly defined, means development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. In the case of floodplain management, this idea is in sharp contrast to many of the past and existing policies and programs, which tend to take a short-term view and unintentionally compromise the future both of floodplain ecosystems and of the people who must live with (or without) them. For example, in most parts of the United States, flood hazard planning and mapping fails to take into consideration the likely future condition of the floodprone area and instead, bases risk analysis and resultant decisionmaking on levels of development and urbanization that are outdated almost immediately. As another example, widespread current practices are teaching people how to build supposedly safer

buildings in floodplains. This policy enables more intensive and extensive development of floodprone areas, particularly along the coast, that over the long run would be far better left vacant.

All of the major tenets of sustainability are ideas that have been supported and fostered by floodplain managers for decades. They include recognition of the interconnectedness of environmental, economic, and social actions; a balance of present needs with future needs; recognition of natural and geographic boundaries rather than artificial or political boundaries within which to make decisions; and a locally based, participatory planning and decisionmaking process. More and more, disaster resiliency is being included as another component of community sustainability. As used in relation to natural disasters, resiliency or resistance means being able to “bounce back” fairly quickly from an extreme natural event (such as an earthquake, tornado, hurricane, or flood) without permanent, intolerable damage to or disruption of natural, economic, social, or structural systems and without massive amounts of outside assistance.

Ideally, if it has given proper attention to the principles of sustainable development and disaster resilience, a community should be able to withstand natural extremes such as floods without experiencing them as “catastrophic” or “disastrous” events. They could pass as uneventfully as might a particularly hot summer day, or a heavy snowfall. A community that has undertaken a comprehensive set of disaster mitigation activities along with its measures for sustainability gains multiple benefits. Not only is the community safer and more resistant to disaster, it is also more economically and environmentally durable and more efficient. Lives are saved, injuries are minimized. Essential services can reach people in need. Devastating property damage and community disruption are minimized. Business can resume more quickly or continue as usual in the face of hazardous events. Homes and schools can avoid costly repairs. And local governments meet their mandate to ensure the health, safety, and welfare of their citizens, even in the face of floods of disastrous magnitude. In addition, the residents of such a community enjoy a stronger economy and a better quality of life on a day-to-day basis.

Activities that strengthen a community’s overall social, economic, and environmental sustainability in most instances also contribute to its disaster resiliency, and vice versa. Thus, working toward sustainable communities (and, eventually, regions, nations, and the world) goes hand in hand with working towards resilience to disasters.

It is easy to see that there are many, many possible activities and techniques that can be used by people to become “flood resilient”: warnings, flood control measures, maintaining floodprone areas as open space, insuring property against flood damage, installing flood-resistant construction, managing stormwater, and so on. Virtually any action that reduces future flood losses or impacts (usually called “mitigation”) is contributing both to flood resiliency and to long-term sustainability although, depending on the circumstances, some contribute more than others. The fact that mitigation serves so many purposes simultaneously explains why it is considered the cornerstone of disaster-resilience and is at the center of flood management activities in the United States today.

The ASFPM supports the concept of sustainability, and encourages its adoption as a basis for programs and policies for floodplain management at all levels. It is holistic, broad-based, sensitive to the natural functions of floodplains, and demands local control and responsibility. In the rest of this document, the ASFPM explains some of the ways in which this recommendation can be implemented.

- Sustainability should be incorporated into the practice of floodplain management.

- Specific information about, and techniques for, sustainable floodplain management need to be catalogued, documented, and built into the appropriate curricula of universities, elementary and secondary schools, training facilities, and programs for the continuing education of professionals.
- Programs such as the Federal Emergency Management Agency's Project Impact, which fosters the development of model “disaster-resistant” communities through public-private partnerships, citizen involvement, comprehensive planning, and a multi-hazard and multi-purpose approach to mitigation, should be expanded and encouraged.

COMPREHENSIVE PLANNING FOR SUSTAINABILITY, DISASTER RESILIENCE, AND MITIGATION

A local or regional comprehensive plan (sometimes called a master plan, and distinct from a floodplain management plan) is a collection of policies on how the community or region will grow and change in the future, and should also be a blueprint for how it can achieve and maintain sustainability and disaster resiliency. The plan is the result of a process that involves many local departments, business people, landowners, developers, and citizens. Out of the process emerge policies that reflect local values and concerns. Comprehensive plans should include elements that deal with land use, transportation, housing, community facilities, economic development, education, historic preservation, the environment, and other issues. Floodplain management policies should be part of the overall decisionmaking process; they may be included in the plan’s environmental element and cross-referenced to sections on land use, community facilities, and public infrastructure.

Comprehensive planning, zoning, and subdivision control are a local government’s primary land use tools. They can serve as a foundation for the community to address floodplain development concerns. Floodplain development standards in the form of a community’s zoning ordinances, subdivision regulations, building and health codes, and special purpose ordinances build on that foundation by providing for mitigation measures that reduce or prevent flood damage. For example, if the community policy is to avoid development in the floodplain, the plan should indicate that major investments in new roads and utilities will not be made in those areas. If, through the planning process, the community had decided to convert portions of the floodplain to recreational use or open space, that too, should be stipulated in the comprehensive plan.

In this time of competition for scarce economic development dollars, disaster-resistant communities have an advantage in attracting and sustaining business. Integrating mitigation into community planning, development, and decisionmaking is an important step towards building that disaster resiliency and overall sustainability. The International City/County Management Association is forming the Natural Hazard Mitigation Program to foster such communities. Similar efforts have been led by the ASFP, the American Planning Association, the Federal Emergency Management Agency, the Institute for Business and Home Safety, and others.

- Localities should adopt plans that use the sustainability approach.

IMPROVING MITIGATION

The ASFPM historically has promoted nonstructural flood loss reduction measures. Their effectiveness has been emphasized in part because of the imbalance between structural and nonstructural techniques in federal and state programs and policy. For example, a large number of

flood control projects have been built in this country, resulting in the prevention of a significant quantity of flood damage. However, only recently have vital nonstructural actions been brought onto the scene to complement the structural protection. What is more, the nation's citizens and policymakers have not recognized the inherent limits of existing statutes and prevailing policy to curtail excessive flood damage. In consequence, the nation faces continuation of the dismal cycle of losses, partial protection, further induced (though marginal) development, and more unnecessary losses. Action can and should be taken to change this situation, by emphasizing the wide array of nonstructural approaches that are available to mitigate flood losses, and by finding ways in which they can be combined with existing structural projects to yield a more balanced approach.

Mitigation, successfully applied, contributes both to flood resiliency and to long-term sustainability. A shortcoming of some federal mitigation strategies is that they are based on solving a problem only after a property has been damaged. Although this approach ensures that efforts are applied to actual problem areas, for mitigation to be cost-effective and practical we must also carry it out in non-disaster settings. Using disaster assistance programs or flood insurance claim payments for mitigation is an important step, but it is only one relatively narrow and rare opportunity. Other strategies and techniques, like those described below, need to be considered. Many of these recommendations can be implemented by reallocating the resources already at hand.

NONSTRUCTURAL MEASURES

Nonstructural mitigation measures are efforts to manage the use of floodprone land so as to curb damage from the flooding that can normally be expected to occur. Support for this approach requires an appreciation of a larger picture than that sometimes evidenced by promoters of structural measures. Nonstructural techniques are a highly effective, low-cost method of damage prevention that would greatly benefit from an institutionalized fostering of common sense instead of the current subsidization of unwise behavior. For example, channels and levees often are built to contain river flows, but these structures cut off human access to the river and also can result in unexpected—and potentially catastrophic—damage when the structures are breached or overtopped. A more balanced approach would be to build the levee, but site it farther away from the riverbank and complement it with nonstructural techniques such as purchasing and removing buildings that are too close to the water, requiring other buildings (those in the flood fringe) to be elevated, and keeping the vacated land in public ownership. This combination of structural and nonstructural measures will reduce flood losses, preserve and maintain natural riparian functions, and provide for recreation and public open space.

Nonstructural alternatives have been insufficiently utilized. There has been a general—and not wholly inaccurate—perception that localities and individuals have preferred flood control structures to the exclusion of almost all other avenues of loss reduction. But now many local sponsors understand that there are alternatives to structures, especially those packaged to address multiple local needs such as open space, economic development, recreational opportunities, and jobs. Good evidence of this was the way communities and states flocked to the idea of buyouts of floodplain structures after the 1993 floods and other major floods since then. Nonstructural projects, however, still lack clear authorities and direction.

- Institutional arrangements for delivering nonstructural programs after a disaster (modeled after those used after the Midwest floods) should be made permanent. This has been done to a great extent, but it should not be allowed to backslide.

- Permanent authority for nonstructural projects should be established. Although nonstructural alternatives are theoretically feasible under current authorities, the non-structural projects brought to fruition to date have been pushed by knowledgeable individuals fully committed to their implementation. Internal, systemic biases need to be removed from program guidelines and benefit/cost analyses so that nonstructural alternatives can move forward on their own merits.

Natural and Cultural Resources

The legacy of our early river communities has helped define American history and is an important source of local pride. These same riparian zones continue to provide outstanding habitat for many animals, fish, and plants. Floodplain management policies need to recognize and incorporate these values both for the reduction in flood damage provided by open-space floodplains and also for value of the basic resources inherent to these natural areas. An investigation of the natural and beneficial functions of floodplains in relation to flood loss reduction was mandated by Section 562 of the National Flood Insurance Reform Act of 1994. The task force directed to conduct the study prepared a draft report, *Flood Loss Reduction: The Natural and Beneficial Functions of Floodplains*. The report is written for Congress and the public. Part of the draft report focuses on protecting the natural functions of floodplains, and thereby reducing flood losses, by bringing together responsible officials, landowners, and the technical expertise necessary to make informed decisions about floodplain activities. To fully integrate these values into flood policy will take time, but several steps can further the process.

- Buffer zones along rivers, streams, and smaller waterways should be encouraged. These zones are valuable land management practices that allow riparian areas to remain in a natural or undisturbed condition for some distance from the edge of a watercourse. They are effective in improving water quality, controlling erosion, retarding flood flows, and enhancing habitat. A narrow strip of dense grass traps sediment for surface flow, while a wider strip in deep rooted grass and trees, for example, can improve subsurface flow, protect the quality of groundwater and surface water, and provide wildlife habitat.
- Natural resource economists should be challenged to develop better methods for quantifying the economic benefits of natural and cultural resources. Those methods need then to be widely adopted and applied.
- Locally developed comprehensive watershed management plans that incorporate multiple resource values are needed. Unfortunately, watershed management has not taken this direction in past or current federal policy and instead has tended to focus almost exclusively on water quality. To facilitate these comprehensive plans, the federal government needs to encourage communities to use a common planning process, perhaps following the model of the National Park Service's Rivers, Trails and Conservation Assistance Program.
- A national riparian zone policy is needed to clarify the importance of, and the steps needed to protect, maintain, and restore the areas along our rivers and streams so that they can not only provide their natural benefits to today's population but also survive as sustainable ecosystems into future generations. A first step would be recognizing the multiple benefits of riparian zones for habitat, water quality, flood protection, recreation, cultural resource protection, and others. This would help to shape program interaction and clarify the need for holistic management.

- National emphasis should be placed on maintaining the natural storage capacity of suitable areas within all watersheds. If runoff from uplands is not addressed, downstream floodplains simply continue to expand, and increased flood damage is inevitable. This goal can be approached through development regulations, wise agricultural policies and practices (discussed below), easements for temporary flood water storage, and preservation of natural areas.

Building Codes

The ASFPM believes that incorporation of standards for flood-resistant construction in the new International Building Code and in the International Residential Code is a major step forward in implementing floodplain management at the local level. In particular, it will help ensure that building officials become involved in that part of the floodplain management process that deals with how buildings are constructed. States and communities will be adopting the International Building Codes and the International Residential Code over the next several years and there will be significant implementation issues. Additional professionals thus will be brought into the floodplain management partnership.

- The ASFPM recommends that extensive training and education efforts be undertaken, targeted toward both code officials and floodplain managers. Both groups need to become aware that fully integrating building codes and the land use requirements embodied in floodplain management ordinances will produce an effective local flood loss reduction program.

Refining National Flood Insurance Program Development Standards

At the time they were developed, the National Flood Insurance Program and its regulations represented a political compromise. We now know that the current regulations are not providing long-term 1% chance flood protection for new construction. To further prevent future flood damage the following should be implemented.

- Consideration should be given to modifying the National Flood Insurance Program requirements so that new construction has from 1 to 3 feet of freeboard above today's estimated base flood elevation. This would acknowledge and mitigate uncertainties, account for increased runoff caused by future development, allow for the wakes of rescue boats, and provide a margin of safety for wind-induced wave action on wide flooded areas.
- An alternative to a standard freeboard requirement would be to use some sort of confidence limit in the determination of flood peak flows. Under current procedures, all statistical analysis of river flows and regional analyses are done and then a 50% confidence limit is applied to the estimate. That means that it is acknowledged that the estimates of 100-year peak flows are low 50% of the time and high 50% of the time. Using the 90% or 95% confidence limit instead would rationally increase those estimates so that there would be fewer "surprises." Consideration should be given to using a 90% confidence limit with one foot of freeboard or a 95% confidence limit with no freeboard.
- A no-rise floodway with no impact on water surface and velocity should be required, so that *only* those areas of insignificant hydraulic conveyance could be filled. Allowing cumulative filling of the floodplain until a 1-foot increase in base flood height is achieved (the current standard) causes

additional flood damage on properties in the floodplain, increases downstream flood peaks, and promotes the filling of riparian zones that would be valuable natural resources if left undisturbed.

- Fill should be treated like any other engineered foundation, so Letters of Map Revision should not be issued based solely on fill. When there is a need to waive flood insurance, the Federal Emergency Management Agency should issue a letter of flood insurance waiver based on the structure's being above the 1% chance flood elevation, but not remove the entire property from the mapped floodplain.
- Developers sometime seek to go beyond waiving flood insurance and remove the "floodplain" designation from a property, and then develop that property with basements or in other ways that would not be possible on floodplain lands. Removing the designation of "floodplain" from a property on an accurate floodplain map should be contingent on (1) waiving future flood disaster assistance for 1% chance or smaller floods, and (2) requiring waivers to be recorded on the property deed.

Integrating Stormwater Management and Flood Loss Reduction

Stormwater management programs have significantly reduced localized flood damage, especially in areas subject to future development, and have the potential to make an even greater positive impact in the future. Unfortunately, current federal and state programs for stormwater management and for flood loss reduction are delivered through two completely distinct mechanisms. At the local level where integrated programs should be implemented, staffs are being split between the two areas or are having to juggle the different programs. This is best illustrated by the direction of the National Pollution Discharge Elimination System program, and the Environmental Protection Agency's holistic watershed management process, which in spite of its name focuses on water quality to the exclusion of most other considerations. This is not productive policy. For localities to be able to integrate stormwater management and floodplain management effectively, state and federal programs need to be coordinated. For example, the State of Washington is using its Environmental Protection Agency authority to manage runoff from the 1% chance flood, which will have a major positive effect on future flooding.

- There should be more emphasis at the federal and state level on integrating the flood loss reduction and water quality components of stormwater management.
- The Federal Emergency Management Agency and the Environmental Protection Agency should co-sponsor a forum to begin looking at integrating their respective programs and thereby facilitating a more holistic approach at the state and local levels.
- All demonstration projects funded through the Federal Emergency Management Agency's Hazard Mitigation Grant Program and through the Environmental Protection Agency's Section 319 Nonpoint Program should take into consideration *both* flooding and water quality.

STRUCTURAL MEASURES

Structural mitigation projects are generally large-scale public works or engineering efforts to manage and control water to avoid damage from high discharges. Although they reduce damage from frequent nuisance flooding, these control structures in many cases have encouraged development in

“protected” areas. This scenario creates a unique potential for catastrophic losses in the event of failure, design exceedance, or eventual removal or decommissioning of the structure. As a consequence, once a flood control structure is built, society must forever bear escalating operation and maintenance costs. In addition, since structures are only built to a certain level of protection (for economic reasons), events exceeding those levels can occur and damage will be greater than it would have been even without the structure, because in the meantime no complementary nonstructural measures (regulations, setbacks, insurance) were applied.

- Planning for structural projects must be developed from a watershed- or basin-wide perspective to help determine appropriate, complementary structural and nonstructural approaches.
- A concerted effort must be made to estimate the useful life of existing flood control structures nationwide, and to make plans for a comprehensive program of maintenance, inspection, replacement, and removal as warranted.
- New structural measures should be built to protect not just to the 1% chance flood, but rather to the 0.2% chance flood, to avoid losses from catastrophic failure.
- There is a need for a maintenance, inspection, and safety program—similar to the Federal Emergency Management Agency’s Dam Safety Program—to oversee flood control works in total.
- Flood hazard maps should depict the failure zones of all dams, levees, and floodwalls. Not only is this identification important for notification and warnings, but also development in these zones should have added flood protection, and flood insurance should be mandatory.

Dam Safety

Many of America’s dams have exceeded their intended lifespan, are in critical need of repair, and pose a serious safety risk. In the *1998 Report Card for America’s Infrastructure*, the American Society of Civil Engineers noted that “an alarming number of dams across the country are showing signs of age and lack proper maintenance. Downstream development is increasing. Dam safety officials estimate that thousands of dams are at risk of failing or are disasters waiting to happen.” According to the American Society of Civil Engineers, more than 200 dam failures have occurred in the past 10 years. Approximately 9,200 regulated dams are categorized as high hazard, that is, their failure will likely cause significant loss of life and property. Thirty-five percent of these dams have not been inspected since 1990 or before, and estimates for the cost of rehabilitation reach \$1 billion nationwide.

Ownership of dams and other flood control works historically has been dedicated rather haphazardly to local sponsors that may or may not have had the interest or ability to maintain the facilities. Often, easements were granted for access and inundation that in today’s legal climate would be viewed as highly informal and even unenforceable. The Dam Safety Program facilitated by the Federal Emergency Management Agency has urged the voluntary adoption of minimal standards for the inspection and maintenance of dams.

- States have the legal basis, but need incentives to develop strong state dam safety programs. The federal agencies could encourage such state action by tying significant cost-shares for federal programs like disaster relief to the adequacy of a state's dam safety program.
- Dam failure zones should be shown on flood maps.
- Zoning below dams should be tied to failure zones to prevent low-hazard dams from become high-hazard ones.

Aging Small Watershed Projects

Beginning in the late 1940s, the U.S. Department of Agriculture's Soil Conservation Service (now called the Natural Resources Conservation Service) began building small watershed dams for flood control and sediment detention across the United States. Today, some 10,400 dams, located in 46 states and part of 2,000 watershed projects covering 160 million acres, are seriously aging, and many are beginning to reach the end of their useful engineering lives, usually 50 years. When these projects were built, the federal government relinquished all responsibility to the non-federal sponsors, usually local flood control or soil and water conservation districts. Currently, one-half of these dams are over 30 years old, and the U.S. Department of Agriculture estimates that over the next 10 years more than 1,300 of them will reach the end of their life expectancy. Due to siltation, many have lost much of their original storage capacity already, and many pose significant safety hazards. Proposals have been made to provide new federal authorization and funding to rehabilitate these dams at 65% federal expense. In a number of cases, however, rehabilitation may not be the most cost-effective or beneficial approach and also may not be an appropriate federal responsibility.

- Any program for addressing aging small watershed projects should include a watershed-based, multi-objective planning process to assess the full range of structural and nonstructural approaches for water management in the entire affected basin. The process should review the purposes of the project and identify options for rehabilitation, reoperation, replacement, decommissioning, and/or removal of structures to help assure that actions taken will be in the context of contemporary watershed needs.
- The Natural Resources Conservation Service and other federal agencies should provide technical assistance, if requested, to analyze options for addressing the aging small watershed dams.
- Congress should carefully consider what the appropriate federal role should be with regard to the future of these aging small watershed dams.

AGRICULTURE POLICIES

Most floodplains in the United States are intensively farmed. Although flood damage to crops in floodplains does not receive the publicity that urban damage does, losses and the cost to taxpayers are usually considerable and often exceed urban losses because of the large number of acres involved. *Sharing the Challenge* detailed that during the 1993 floods agriculture accounted for over half of the damage. In addition to the direct monetary losses from floods, intensive agricultural production on floodplains results in the continuous loss of the natural protective value of those floodplains. In some areas with extensive federal levees, like in the Midwest, it has become customary to construct low-level agricultural levees that further confine the floodplain.

- There needs to be an examination of incentives and disincentives for farmers that will lead to appropriate use of agricultural floodplains. Where crop losses due to flooding are frequent, this may mean returning those floodplains to a more natural condition or using alternative crops that will not be damaged by flooding. This also will minimize erosion and improve water quality by reducing the runoff during flooding of pesticides and fertilizers that are now used to enhance production of row crops on these floodprone lands.

Long-term Easements

Keeping floodplains free of agricultural uses that suffer losses from frequent floods is the surest way to reduce the need for large annual government disaster payments, and to return floodplains to a more natural state in which they will better serve to store flood waters and reduce downstream flood damage. Easement programs developed after the 1993 floods have demonstrated landowner acceptance of permanent easements and their effectiveness on a large scale. Enough of the disaster funds appropriated to the U.S. Department of Agriculture were allocated to the Emergency Wetland Reserve Program to purchase permanent protective easements on over 90,000 acres of cropland. This was a strictly voluntary program that enrolled primarily land on which natural wetland resources and functions could be restored, and where the cost to the government to purchase the easement was less than the cost to return the land to production.

Based on the success of the Emergency Wetland Reserve Program, Congress authorized in the 1996 Farm Bill (the 1996 amendments to the 1985 Food Security Act) a floodplain easement purchase option under the Emergency Watershed Protection Program. Approximately \$15 million has been allocated in each of the last three years to the purchase of long-term easements under this emergency program. Landowners participating in the program receive approximately the agricultural value of the land for a permanent easement. Although shorter term easements are available for a somewhat lower payment, most farmers opted for permanent easements. Over 80% of the 40,000 acres enrolled in the first two years, mainly in North and South Dakota, are under permanent easements. Although a strictly voluntary option, over 50,000 acres are on the waiting list for enrollment when more funds become available. The funds available could increase if there are more floods than normal, or if Congress gives a higher priority to the program.

Under the regular Wetland Reserve Program, most of the nearly 900,000 acres that will have been enrolled by the end of 1999 are in floodplains. By the end of FY2000 the Wetland Reserve Program will have enrolled acres up to its authorized limit. Momentum is building to increase the authorized acreage cap. Under all three programs, wetland and natural floodplain values are restored on most of the land with federal funds. In addition to reducing future agricultural flood losses, the floodplain storage provided by this land will contribute to lower flood peaks in the future. There are also over

1 million acres of floodplain and wetland cropland now in the Conservation Reserve Program, through which the farmers receive annual rental payments in exchange for restoring or allowing the land to revert to more natural conditions. However, the Conservation Reserve Program contracts are only for 10 or 15 years, after which time the land can be returned to crop production or any other use.

- The ASFPM recommends that additional funds be provided for permanent easement programs, instead of continuing to fund programs (like short-term non-production contracts and easements) that perpetuate unwise agricultural use of floodplains.
- Greater emphasis should be put on the use of Emergency Watershed Protection Program funds for the purchase of permanent easements, rather than on levee reconstruction and other measures whose aim is to return flood-damaged agricultural lands to row crop production.

Buffer Zones

Several U.S. Department of Agriculture programs will now cost-share or pay farmers to establish buffers along streams and other waterways. Under the Continuous Conservation Reserve Program and Conservation Reserve Enhancement Program, funds are available to establish up to 150-foot buffers along every river, stream, and drainage ditch in the country. A grass or wooded buffer can be established in cropland, and a planted or natural wooded buffer in cropland, pastureland, or rangeland. The program will pay an annual “rental” payment to the landowner for at least 15 years and at least half of the establishment costs, including any needed fencing. Measures to be implemented early in 2000 will greatly increase landowner incentives. The U.S. Department of Agriculture will also pay up to the equivalent of 75% of the cost of restoring or establishing wetlands in the riparian buffers.

Through state-negotiated Conservation Reserve Enhancement Programs, additional incentives are being provided in many states. In some of the state-negotiated programs the widths of the buffers have been expanded to include all of the frequently flooded floodplain in critical watersheds. Several states are making some or all of the incentive payments they contribute contingent on the landowner’s agreeing to a permanent easement on the riparian buffers.

- Because of the tremendous benefits that riparian buffers can provide, the ASFPM recommends that the Continuous Conservation Reserve Program be converted to a permanent riparian buffer easement program nationwide.
- All states should work with the U.S. Department of Agriculture to develop Conservation Reserve Enhancement Programs to leverage state funds to permanently protect riparian buffers and floodplains.
- Programs that support the creation and maintenance of riparian buffers should be applied to urbanizing areas in addition to rural, agricultural ones.

Agricultural Levees

After the 1993 floods a sense of urgency developed on the part of Congress to restore non-federal agricultural levees. Even though, in many places, the cost of restoring the levees exceeded the value of the land, many levees were rebuilt either with federal funds or through a patchwork of voluntary

state, private, and federal programs. Currently, the U.S. Army Corps of Engineers' levee repair program pays 80% of the non-federal levee repair costs under P.L. 84-99, providing a significant subsidy to levee districts and especially those with repeated levee failures. Funds were also available to clear drainage facilities and to remove accumulated sand and silt. Landowners pressed to get the work done as soon as possible because it cost them very little.

These rebuilt levees in many instances are higher and stronger than the earlier ones (which typically were not built to provide 1% chance flood protection). This will result in higher flood heights and more damage during the next major flood. In addition, agricultural production has been resumed on the floodplain lands "protected" by the levees.

- Agricultural levees should be constructed so that they have no impact on the flood heights or the floodway of the 1% chance flood.

Farm Cropping Support Programs

The "freedom to farm" portions of the 1996 Farm Bill replaced the set-aside and guaranteed crop subsidy programs with a guaranteed declining annual payment. However, it only reduced total payments planned for 2002 to 60% of previous levels. Without any planting restrictions farmers have, in effect, been encouraged to take risks and bring more floodplains and other marginal land into production. In addition to crop insurance and several other programs left in place to protect farmers from suffering significant flood losses, most farmers and farm organizations know that politicians cannot resist coming to the aid of farmers in times of natural disasters. As a result, farmers, working to increase total income, have increased the planting of row crops on frequently flooded floodplains and other marginal lands. Corn and soybean acres planted and yields per acre increased over 8% between 1995 and 1999.

In both 1998 and 1999, floods and drought destroyed crops in many areas while overproduction in other areas brought about all-time low prices for most farm crops. The result was an economic disaster. With an additional \$8.7 billion added to the FY2000 U.S. Department of Agriculture budget for 1999 disaster payments, total farm payments for 1999 were the largest in history—over \$28 billion to allow farmers to plant as much or more land the next year. Over \$5.5 billion was simply handed out as supplemental "freedom to farm" payments. Most of the remaining funds are being used to reduce crop insurance payments an estimated additional 25% for 2000. About \$1.2 billion are targeted to crop loss assistance. The remaining \$1.13 billion are for special payments to oilseed, tobacco, and livestock producers for losses resulting from natural disasters. Despite intensive lobbying by conservation organizations and Administration support, Congress refused to allow a portion of the disaster funds to go for the Wetlands Reserve Program or other conservation programs to protect and take floodplain and riparian lands out of production.

The Emergency Conservation Program, which is regularly budgeted for and supplemented by emergency appropriations, provides 64% emergency cost-share funding for farmers to rehabilitate farmland damaged by natural disasters. The assistance may be used for removal of debris from farmland, grading, shaping, re-leveling farmland, and restoration of fences and irrigation structures. Although the assistance is required to be only for "damage which is not the type likely to recur frequently in the same area," landowners in numerous floodplain areas receive this assistance every few years. There are also Noninsured Crop Disaster Assistance, Emergency Loan Assistance, and Emergency Haying and Grazing Assistance programs.

The Emergency Watershed Protection Program, in addition to now providing for the voluntary purchase of long-term easements, will pay 75% of the cost of opening stream channels and clearing bridges to relieve imminent hazards to life and property caused by floods. Projects must be sponsored by a political subdivision of a state such as a county or conservation district. Most work under this program is in rural areas and usually contributes to the restoration of cropland in floodplains. However, now a portion of the funds authorized for this program can be used to purchase permanent easements (see discussion above).

The 1996 Farm Bill also authorized a Flood Risk Reduction Program to provide a lump sum payment to farmers who had farmland with high flood potential. The payment was to equal 95% of the seven-year market transition payments, and other payments to offset estimated federal outlays on frequently flooded land. Although they could still use the land in any way they wanted, participating farmers would have had to agree to forego all future commodity loans, crop insurance, conservation program payments, and disaster payments. However, this program has not been implemented and funds have not been appropriated; many in the U.S. Department of Agriculture believed the incentives were not adequate to make the program a success.

COASTAL HAZARDS, RESOURCES, AND ISSUES

During this century, public response to such coastal hazards as flooding, erosion, and hurricanes has evolved haphazardly in response to particular disasters. Early dependence upon engineered shoreline protection has been supplemented by building and land use regulations, flood insurance, and beach nourishment, among other approaches. Yet the situation today, far from being improved, is in fact more perilous.

Over the past few decades, the distribution of the U.S. population has shifted, so that now over 50% live in coastal regions. This has led to the potential for massive loss of life when a major hurricane strikes a heavily populated area. Even with a few days' warning, a coastal region's infrastructure (bridges, road capacity, highway elevations, etc.) may well be inadequate to evacuate the number of people at risk. What is more, ever more intensive coastal development puts more and more high-value property at risk, so that future disasters are certain to be unprecedentedly costly. Finally, that very development endangers the coastal resources (dunes, beaches, wetlands, mangroves, etc.) that attracted people in the first place—resources that, if left undisturbed, could provide some measure of natural protection from coastal storms and other processes.

Yet there are numerous explicit and implicit incentives built into government policies at all levels that operate to encourage and subsidize coastal development. With regard to flooding in particular, there is a major dichotomy in national policy, namely that nationwide, building is essentially prohibited in riverine floodways, but in coastal velocity zones (those areas subject not only to high water but also to the energy of moving waves) even residential buildings are permitted as long as certain construction standards are met. Thus, instead of teaching people that hazardous coastal areas should not be developed because of the risks from flooding, high-velocity waves, winds, and erosion, we are instead encouraging development in those areas. Significant shifts are needed in the nation's approaches to several aspects of coastal hazards.

COASTAL POPULATIONS AT RISK

In recognition of the fact that there appears to be no way to slow down the increase in coastal population, some improvements in emergency evacuation and warning systems have been made.

Much of this has been paid for through hurricane programs funded by the Federal Emergency Management Agency and the U.S. Army Corps of Engineers. There are tidal telemetry systems along many coastal access roads and causeways crossing bays to get to islands. This allows for real-time flood height data to be transmitted to emergency management personnel so that evacuations can be directed or redirected. Since much of the population in many coastal areas is seasonal, in some states efforts have been made to educate non-residents through brochures explaining flood and storm hazards, evacuation routes, dos and don'ts, etc. Coastal realtors make these brochures available to renters. In some areas, coastal roads are required to be elevated when they are built or rebuilt after a disaster, using the Hazard Mitigation Grant Program administered by the Federal Emergency Management Agency, making it more likely that they will be passable in a future evacuation. In spite of this progress, the mass evacuations along the East Coast during the 1999 hurricanes demonstrated that the transportation network as a whole is not as capable of handling a large evacuation as had been previously believed.

- Approvals of future coastal development should be contingent on the demonstration of adequate plans for and the ability to evacuate the at-risk population.
- Incentives should be targeted toward encouraging coastal localities to have evacuation plans in place within a certain time frame.
- Federal, state, and local highway systems need to be planned and constructed with consideration given to mass evacuation from coastal areas.
- Cooperative efforts should be undertaken among the professional groups for floodplain management, emergency management, hurricane prediction, wind engineering, erosion prevention, and others, for warning people and localities about the risk inherent to coastal areas, and how to address those concerns.

COASTAL CONSTRUCTION

As noted above, there is a serious question about whether construction—especially residential construction—should be allowed in very near-shore areas. But existing policies allow and even foster such development.

- The ASFPM recommends that, over the long term, coastal states and localities examine seriously the possibility of gradually “retreating” from the shoreline, not only to reduce the potential loss of life and catastrophic levels of damage from future storms, but also to preserve coastal resources, ecosystems, and processes.

Improvements in construction techniques and the substantial improvement requirements of the National Flood Insurance Program have resulted in much safer, storm-resistant homes being built. The recently amended *Coastal Construction Manual* (due out in early 2000) should provide even better guidance on all aspects of construction, including siting and design. There is still room for improvement, however, and design and construction to cope with the high winds that accompany coastal storms remain problematic. Further refinement of the regulatory and management approaches most effective for coastal areas should be made.

- Under the National Flood Insurance Program, the coastal zone designations and their accompanying construction standards should be revisited. A Zone standards are inadequate in those coastal areas now defined as overwash, or AO, Zones. These areas are not V Zones, but they still can experience up to 3-foot breaking waves and significant flow down the back side of dunes and street ends. The wave action and velocity dictate different standards for coastal A Zones and riverine A Zones. The Federal Insurance Administration recognizes the possible need to differentiate, in the insurance rates, between the two types of A Zones.

FLOOD MAPS

Significant updates and remapping are needed of the coastal areas depicted on Flood Insurance Rate Maps, including V Zone and A Zone boundaries, and AO Zones. For those areas that have been remapped, the changes on the ground are often significant. In addition, there is a discrepancy between the definition of V Zones in the National Flood Insurance Program regulations, and the delineation of V Zone boundaries on the Flood Insurance Rate Maps. The maps need to catch up with the 1988 change in the definition of V Zone, based on primary frontal dunes.

SHORELINE EROSION

The nation has begun to do a better job of identifying and mapping erosion zones in the last few years, with funding support from the Federal Emergency Management Agency. There is fairly widespread agreement among all stakeholders on these erosion problems. The real difficulty lies in how public policy should respond to erosion. Traditional responses of armoring seem less popular, due to the fact that this response often results in adverse impacts to valued beaches and coastal resources. This has caused a shift in focus from “hard” armoring of the coast (with jetties, seawalls, etc.) to “soft” armoring via beach nourishment. The Corps of Engineers has been heavily involved in this, unfortunately often in response to intense lobbying from influential legislators and wealthy property owners.

Beach nourishment has been criticized as the “expensive solution” to erosion, since these projects are paid for by many but benefit relatively few, even when the benefits to ecosystem restoration and habitat enhancement are considered. In addition, the technique is only a temporary solution because periodic renourishment is required over the long term (Corps of Engineers projects and agreements set forth a 50-year project life, with period renourishment every 3-6 years in most cases). Another concern is the acknowledged secondary impacts of these projects, namely induced development and redevelopment.

- The cost-share scheme for beach nourishment projects should be based on the true benefits to each level of government. The National Shoreline Study mandated by the Water Resources Development Act of 1999 would examine the environmental and economic impacts of beach nourishment and should provide a sound basis for re-examination of the costs and benefits of this technique. In addition to beach nourishment, localities, developers, and homeowners should always consider alternative strategies for mitigating erosion, such as property acquisition or increased setbacks.
- Public access to nourished beaches should be improved. Nourishment projects do require easements to place sand on private property and to allow the public to walk on and use the newly placed sandy beach. However, in many areas there is inadequate parking to facilitate this beach access.

Erosion insurance is being reviewed by the Federal Emergency Management Agency as required by the National Flood Insurance Reform Act of 1994. The initial idea was to determine the feasibility of having flood insurance premiums under the National Flood Insurance Program account for erosion risk in addition to flood risk. Presumably there would be a policy surcharge for homes located in the defined erosion hazard areas. The required pilot studies for erosion hazard area identification and mapping have been completed and the economic impact analyses are now underway by the H. John Heinz Center for Science, Economics and the Environment to see how much real estate is located in these defined erosion hazard areas and what its value is. It will be up to Congress to determine what to do with the information from these studies.

- The National Flood Insurance Program should be modified to provide an insurance policy benefit for coastal erosion and mudslides only where those hazards are clearly mapped and regulated.
- One option the ASFPM favors is an erosion hazard surcharge on National Flood Insurance Program policies if the areas subject to erosion can be accurately identified and mapped.
- Another approach would be the establishment of setback requirements for new construction and substantial improvements to existing construction along eroding shorelines. Residential structures would be allowed only if they are moveable.

COASTAL BARRIERS

In the early 1980s, both the folly of federal expenditures on hazardous coastal barriers and the wisdom of leaving them in an undeveloped state were recognized, leading to adoption of the Coastal Barrier Resources Act of 1982. This act prohibited direct and indirect federal assistance—flood insurance, shoreline protection, water projects, highway and bridge subsidies, and other federal incentives to development—within specified undeveloped coastal barriers. The barriers so designated, along with those added since then, have become the protected Coastal Barrier Resources System. Nevertheless, development continues on coastal areas outside the System, either without flood insurance or with private insurance. Also, there are continuous political efforts to have certain designated barrier areas removed from the System so that development is not hindered by the lack of federal subsidies.

- The standards set in the Coastal Barrier Resources Act need to be diligently enforced, and protected areas should *not* be removed from the Coastal Barrier Resources System.
- Additional federal and state funds should be devoted to purchasing or obtaining easements on coastal barrier lands in order to minimize high-risk development.

ECONOMICS

The use of economic justification for pursuing flood control has had important, and perhaps unintended, impacts on the way flood control is justified. In far too many cases we have allowed economics as measured by the National Economic Development standard or determined according to a benefit/cost ratio to become the bottom-line indicator of the feasibility of any project. While clearly economics must play a role in the decisionmaking process, the policy evolution that has made

benefit/cost economics the “acid test” is ill founded. Stepping back from the perceived logic of benefit/cost today we have a policy that does the following.

First, flood control spending has become premised on an economic return. This begs the question whether we are directly or indirectly encouraging investments in high risk areas. Second, the systems are not set up to recognize least-cost alternatives, which may not be justified by a benefit/cost ratio. Why are we spending more money to solve the problem? For example, we can justify with a benefit/cost ratio a project to build a \$10-million levee to partially protect some residences, when we could have had a permanent solution by using the same amount of money to purchase the properties outright and leave the land in open space. Finally, our investment-based approach does not fully consider that the real policy problem facing the U.S. Treasury is cash flow. During the 1990s Congressional debate over disaster funding has shifted from funding the disaster by increasing the national debt, to funding disasters based on offsetting cuts in the budget. This is a sound fiscal approach, but its policy ramifications are large. Our current policy does little to match project activities with the goal of minimizing the creation of tomorrow’s losses. Instead, it is heavily focused on repairing yesterday’s mistakes.

ANALYSIS OF BENEFITS AND COSTS

Using floodplains in a way that results in periodic flood damage is not, in itself, unwarranted or inefficient. It may well be that, in certain situations, the advantages outweigh the intermittent cost of damage from floods. Further, some activities can only be conducted near the water. Principles of national economic efficiency require, however, that the benefits of floodplain occupancy exceed all associated costs, not merely those borne by the individual or enterprise that is located at risk.

Benefit/cost analysis has been the established decisionmaking tool for project evaluation in federal water resources programs, and receives widespread use for engineering projects in general. It was well suited to planning for traditional purposes, such as flood control, where both project costs and benefits were accounted for in a common unit of measurement—the dollar. It becomes problematic for less traditional applications that involve environmental, cultural, and other benefits that do not lend themselves to standardized, simplistic units of measure. Although it is a useful tool for making economic decisions, benefit/cost analysis should not be the only consideration in determining what activity or project to fund.

- The estimated costs of proposed alternatives to flood problems should include both implementation costs (direct financial outlays for design, real estate acquisition, construction, operation and maintenance, and project monitoring) and economic opportunity costs—any current benefits that would be foregone if the solution is implemented. This would also include any “negative benefits” in the form of project-induced damage to be expected in the future. It is important that the opportunity costs of foregone benefits be accounted for and brought to the table to inform the decision.
- The calculations of benefits on proposed nonstructural projects must be calculated in the same way as for structural projects—to include avoided damages as additional benefits. Land and easements should be considered part of the total project cost, not a local sponsor requirement. Removal of these systemic biases will allow nonstructural alternatives to move forward on their own merits.

- Better methods for quantifying the economic benefits of natural and cultural resources must be developed, adopted, and applied.

THE PRINCIPLES AND GUIDELINES

The *Economic and Environmental Principles and Guidelines for Water and Related Land Resources for Implementation Studies* (known as the *Principles and Guidelines*) were set out by the Water Resources Council in 1983 to prescribe a single federal objective of “National Economic Development” in planning water resources development projects. Critics of the *Principles and Guidelines* (and related manuals) see a bias toward structural solutions to flooding problems, and a failure to properly evaluate nonstructural alternatives. The ASFPM is aware of groups that are analyzing and re-evaluating the *Principles and Guidelines*, which are now more than 15 years old, and would support efforts to update them. Definition and guidance is needed on calculating environmental and cultural values.

- The *Principles and Guidelines* should be revisited, with an eye toward broadening the concept of National Economic Development and refining methods for accounting for benefits. For example, “prevented damage” should be counted as a benefit for nonstructural projects. In the Water Resources Development Act of 1999, Congress directed this change for Corps of Engineers projects and it must now be implemented. In addition, no project can offer full security against all floods. Project economics must reflect the long-term catastrophic disaster costs associated with project-induced development.
- The principles of sustainability should be incorporated into any revision to the *Principles and Guidelines*.

DATA AND TECHNOLOGY

The passing of each flood illustrates more clearly that we are technology rich, but data poor. Adequate data is vital for the decisionmaking processes that determine the most sustainable land use for an area, or the most prudent mitigation project.

GATHERING AND STORING DATA

The 1988 study, *Floodplain Management in the United States: An Assessment Report*, emphasized that there was no system for accurately and systematically estimating flood damage nationwide. That lack is even more painfully obvious in 1999. No agency at the federal level has the task of defining “floods,” defining “damage” or accumulating flood damage data. It is not possible to evaluate a program’s effectiveness without measuring its results in dealing with the problem. We do not yet have a good handle on addressing this, and we cannot hope to get one, without better damage data.

At present no single entity has the responsibility for collecting and storing data about flood- and disaster-related matters. The ASFPM believes that the federal government should take responsibility for collecting the kinds of data that benefit the entire nation and for which significant economies of scale can be realized, such as stream gaging and flood mapping.

- A comprehensive, nationwide database should be established that includes information on the costs of disasters, costs and benefits of mitigation measures, and other pertinent information. This

will require the accumulation and categorization of the data itself, design of a database, and provision for its accessibility by all levels of government and the private sector.

Data for Local Mitigation Plans

Most communities do not have sufficient data to develop adequate mitigation plans today. Neither National Flood Insurance Program claims information nor data on damaged properties is circulated regularly or provided to appropriate state and local personnel quickly after a flood disaster. This makes it all too easy to overlook mitigation opportunities for the damaged structures just at the time when property owners are most open to such possibilities. This information is equally valuable in the pre-disaster setting for mitigation and sustainable planning for Project Impact communities.

- Information on damaged structures gathered by federal agencies, their contractors, and others should be made easily accessible to state and local personnel after a disaster.
- Information on disaster assistance, damage to community infrastructure, flood-related repair costs, and mitigation expenditures would all be useful in helping localities plan.
- National Flood Insurance Program claims information must be shared with National Flood Insurance Program State Coordinators so they can effectively assist localities in mitigation. The location of the insured property (not the premium notice mailing address) should be provided in digitized form, along with the amounts of claims payments, value of the property, etc., so that plans for mitigation can be formulated before the owner repairs the property.
- New and additional methods for estimating flood damage, based on previous inventories of buildings and infrastructure and on flood depths and velocities, should be pursued. The National Institute of Building Sciences and the Federal Emergency Management Agency are now developing such a flood loss estimation model.

Number of At-risk Structures

The number of structures in the flood hazard areas of the nation is not known. An accurate count of at-risk structures is a necessary part of developing a national strategy for reducing or insuring flood losses through the National Flood Insurance Program and through taxpayer-funded programs, such as the Disaster Relief Act and Hazard Mitigation Grant Program. Such an undertaking could be implemented through the Community Assistance Program, by using consultants, or other measures.

- Accurate data on the number of floodprone structures throughout the nation must be collected and made readily available.
- Accurate data on repetitive loss structures should be made available, including the risk and reason for flooding of each structure.
- Localities could be required to identify the number and risk of structures within their jurisdictions as part of a local mitigation plan done under the Flood Mitigation Assistance Program, the Hazard Mitigation Grant Program, or the Community Rating System, with Federal Emergency Management Agency-required 10-year updates to show community progress in reducing flood risk. Consideration should be given to how the Flood Insurance Study process might assist in this

effort. Another option would be to require such an inventory as a condition of community participation in the National Flood Insurance Program, with a reasonable period allowed for accomplishing it. Ideally, all such data should be digitized.

River Discharge

A key piece of data needed at all levels of government for accurate flood mapping, prediction of flood flows, flood warning, and other activities is river discharge from an adequate network of stream gages throughout the nation. Historically, the most comprehensive and reliable data has been the stream gage network of the U.S. Geological Survey. Unfortunately, this network has slowly been shrinking as federal funding to the U.S. Geological Survey itself decreases, and the budgets of other federal agencies, states, and localities (who collectively maintain about half of the gages) are reduced. Thus we are losing—where not already lacking—the basic data from which to develop flood level and risk calculations as well as flood warnings to prevent loss of life and protect communities.

- A critical national network of stream gages must be specified and federally funded through the U.S. Geological Survey's budget. The information from these gages, along with associated data, is baseline information that should be collected and maintained by the federal government, because the whole nation uses it for warnings and risk identification and all taxpayers benefit. States and other organizations that use the data should help secure this funding.
- The U.S. Geological Survey, working with the states, should identify the critical network of index gages.
- Information collected by local governments through their flood warning systems should be considered as supplemental, rather than inferior, data. Flood warning technology has advanced significantly in the last 10–15 years, and we no longer have the luxury of collecting data as an exercise in pure science.

WATERSHED STUDIES OF RANCHING

Farming and ranching can have serious impacts on watersheds and rivers, particularly in the western United States, where much of the ranching is done on leased federal land.

- The federal government should undertake systematic studies of the impact of farming and ranching on watersheds and rivers. All such studies should be done on a watershed basis and include private and state lands, and all land uses. They should include water production and storage for farming and ranching use, and the effects of farming and ranching techniques on flooding, stormwater runoff, sediment production, and water quality.
- Federal policies on leasing land for agricultural uses should be adjusted according to these studies, and incentives should be developed as needed for non-federal lands.

IMPROVING EFFECTIVENESS OF FLOOD MAPS

Flood Insurance Rate Maps, produced and distributed by the Federal Emergency Management Agency in conjunction with the National Flood Insurance Program, are critical to the management and planning of floodplains. They serve as a key planning tool for communities and states by demarcating areas subject to flooding, indicating depth and velocity of the flood hazard for floodplain regulations, and identifying flood insurance rates to be charged. However, to improve their utility and effectiveness, several changes should be considered, and are identified and discussed in depth in the Federal Emergency Management Agency's Mapping Modernization Plan.

- The Federal Emergency Management Agency should work with the Administration and Congress to obtain funding for its map modernization initiatives and continue its Mapping Modernization Plan.

Thousands of stream miles across the country require restudy, and others have never been mapped. At present, the Federal Emergency Management Agency's sole source of revenue for these efforts has been the National Flood Insurance Fund (non-tax dollars). As a point of equity, although the insureds are the significant beneficiaries of these products, society as a whole has also benefited from them.

- Additional funding for map programs is crucial.
- The Technical Mapping Advisory Council should continue to provide guidance on implementation of the Federal Emergency Management Agency's Mapping Modernization Plan. Consideration should be given to using future development conditions for hydrologic and hydraulic calculations to determine flood elevations; setting up a process to map developing areas quickly; requiring developers to perform the necessary engineering studies for large developments; and identifying other hazard areas on the flood maps.
- States that are qualified to perform and administer floodplain mapping programs should administer and manage them for the Federal Emergency Management Agency under its Cooperating Technical Communities Program. This will develop skills and program presence in the states, and also serve as a magnet to develop other sources of revenue for floodplain mapping.
- We must find clearer ways to communicate flood risk so that it is meaningful to citizens and communities, thus enabling them to take appropriate steps to reduce risk and damage. The confusing terminology "100-year floodplain" should be abandoned in favor of language that is more understandable to the layperson. The ASFPM suggests using "1% chance flood." As an alternative, the broader terms "high-risk flood" could be used for the 100-year flood and "moderate-risk flood" when referring to the 500-year (or 0.2% chance) event.
- No matter what their location, structures for which a certain number of flood damage claims have been paid (perhaps two claims) should be mapped and insured as floodplain properties.

Revisions and Amendments to Flood Maps

A number of short- and long-term options need to be explored to simplify and clarify the map amendment process. Currently, there is an assortment of amendments available with confusing applicabilities and procedures. Changing and/or making more specific the name of exception granted would help avoid sending the wrong message, i.e., that the property is no longer subject to regulation or to flood risk.

Developers sometimes fill in the surface of a piece of land before constructing buildings upon it. Because they have raised the elevation of the surface of the property, they can obtain approval for removing the property from the official “floodplain” and hence from regulations. Once such approval is obtained from the Federal Emergency Management Agency through a Letter of Map Revision, buildings may legally be constructed on that land with their lowest floors below the base flood elevation.

- Removing the designation of “floodplain” from a property on an accurate floodplain map should be contingent on (1) waiving future flood disaster assistance for 1% chance or smaller floods, and (2) requiring waivers to be recorded on the property deed.
- Fill should be treated like any other engineered foundation, so Letters of Map Revision should not be issued based solely on fill. When there is a need to waive flood insurance, the Federal Emergency Management Agency should issue a letter of flood insurance waiver based on the structure’s being above the 1% chance flood elevation, but not remove the entire property from the mapped floodplain.
- States or communities with approved capability should be allowed to review Letter of Map Revision submissions and certify their reviews.
- Consideration should be given to requiring flood insurance in the 0.2% chance (500-year) floodplain, thereby greatly reducing today’s clamor for Letters of Map Revision.

Future Conditions

Flood discharges for a watershed typically are calculated based on current runoff conditions and past floods. But urbanization tends to increase both the quantity of runoff and the speed at which it reaches downstream areas, thus worsening flooding over time. Because of this, floodplains need be managed, not to the conditions of the past, but according to the conditions that will exist when the area is fully “built up.”

- To reduce the cost of remapping, minimize future damage, and improve sustainability, flood maps should be based on future-conditions hydrology unless ordinances require that there be no increase in the post-development runoff discharge compared to the pre-development discharge.

Areas Subject to Special Hazards

Several types of flood hazards are not adequately addressed on the Federal Emergency Management Agency’s flood maps. The mapping techniques used seldom reflect the true flood hazards in areas

subject to ice jams and those which experience uncertain flow path flooding (alluvial fans, aggrading and degrading channels, and migrating channels).

- There needs to be full integration of geologic hazards into the floodplain mapping process, because land subsidence, landslides, and mudflows can exacerbate flood hazards.

Maps and Structural Projects

Flood Insurance Rate Maps are used to plan future development and help advise individuals about flood risks. The current practice of modifying a Flood Insurance Rate Map to reflect the presence of a levee, dam, channel, or other structural measure may foster a false sense of security to those living in the area protected by these structures. City officials often forget that floodplains protected by dams are still at risk from flooding. Dam- and levee-failure zones—areas that might be inundated if the flood control structure is breached or overtopped—are rarely mapped. This omission also promotes constricting the channel, the loss of riparian zones, destroying floodplain characteristics, and ultimately leading to higher flood stages (and potentially increased damage) downstream. Options need to be evaluated that reflect how Flood Insurance Rate Maps and resulting management tools could be modified.

- Flood hazard maps should be developed that depict all related hazards, for example, the failure zones of all dams, levees, and floodwalls. Not only is this identification important for notification and warning purposes, but also development in these zones should have added flood protection, and flood insurance should be mandatory, with rates based on the residual risk.
- All development proposals should provide added flood protection for facilities that are built in dam and levee failure zones.
- Properties in failure zones that are bought with federally backed mortgages should continue to be subject to the mandatory flood insurance purchase requirement, with rates based on the residual risk.

ENGINEERING

Hydrologic and Hydraulic Models

- More accurate and flexible engineering models must be developed and incorporated that reflect unsteady state flow conditions, levee breaches, split flows, and hazards of unstable land forms and debris flows. The existence of the Corps of Engineers Hydrologic Engineering Center as a national leader and single point of contact has been beneficial to the advancement of this technology.

Broader Federal Design Manuals

Engineers and planners continue to rely heavily on the federal government's design manuals. At present these manuals do not address bioengineering or other alternatives to structural design. An exception is the new multi-agency *River Restoration Manual*.

- The federal manuals should be expanded to include nonstructural flood loss reduction techniques and ecosystem restoration and thereby foster their use by all engineers, planners, and biologists.

Review of Risk-based Analysis

Engineers have long used the concept of freeboard to account for uncertainty in design. But freeboard is being eliminated under the Corps of Engineers' recently adopted risk-based design approach, which determines a design size optimized by project benefits. This means that a Corps of Engineers structure estimated to provide 1% chance flood protection would be missing the three feet of freeboard now added to most designs. The project economics may dictate a structure larger or smaller than a 1% chance standard, but considering that many proposed federal projects are not justified today because the costs exceed the benefits, a reduction in cost (by choosing a structure that provides lower protection) would lead to construction of more projects.

- A multi-agency review and an independent scientific assessment of risk-based design should be undertaken to consider, among other questions, whether this technique leads to a proliferation of smaller levees, thus increasing exposure for catastrophic flood losses.

The risk-based method tends to move away from the concept of designing to a minimum standard. With its use, the potential exists for the erosion of the minimum standard of 1% chance flood protection. A committee was assembled by the National Research Council's Water Science and Technology Board in late 1998 to conduct an 18-month review of the Corps' use of risk-based analysis.

- Guidelines reaffirming conformance with a minimum design standard should be explicit in the design method.

PARTNERSHIPS AND INCENTIVES

Flood damage is a direct consequence of floodplain investment actions, both public and private. Those who occupy and use the floodplain should be responsible for the consequences of their actions. The federal government is clearly responsible for federal activities that invade the floodplain. But the authority and responsibility for guiding and controlling other land use lies exclusively with non-federal entities. To the degree that state and local governments sanction unfettered floodplain development, including new construction of public facilities, they share responsibility for excessive flood damage.

- The roles, responsibilities, and capabilities of the public, the various levels of government, and the private sector should be clarified and strengthened. Citizens, businesses, and local and state legislators need to better understand that the federal government will not always bail them out after a flood. They must bear their fair share of the risk.

FEDERAL ROLE

In its concern for the general welfare, the federal government has a proper interest in measures to hold flood damage to an economic minimum. It has a responsibility to discourage floodplain development that would impose a later burden upon federal taxpayers, that would benefit a few at the expense of others, or that would victimize unsuspecting citizens. It does not follow, however, that

the federal government should be solely responsible for the success of a program to make wise use of floodplains.

Yet, due to the policy of the last 50 years, the federal government has been cast in that role. What is lacking is the state and local ability to plan for, mitigate, and in general take responsibility for flood hazards in their jurisdictions. That is why the ASFPM believes that incentives should be provided to reward those who are taking initiative to break the cycle of development, damage, and redevelopment at federal expense and instead build their capability to manage flood hazards and floodplain resources.

The optimal federal role would be (1) leadership, including appropriate laws and executive orders; (2) maintaining solid data, including maps, stream gages, forecasts, flood damage data, and watershed studies; (3) providing flood insurance and associated mechanisms; and (4) wielding appropriate incentives and consequences to encourage individuals, communities, states, and the private sector to take appropriate actions and decisions to reduce flood losses. Federal agencies must see their role not as “doing” the planning and implementation of projects, but as facilitating the development of state and local capability and programs.

- Public Assistance should be withheld from the damaged floodplain areas of communities not enrolled in (or not in compliance with) the National Flood Insurance Program. Today there are few, if any, economic sanctions for local governments that fail to participate in the National Flood Insurance Program, even though their failure makes their citizens ineligible for Individual Assistance, federal home loans, and other services. In effect, the individual citizens are penalized, while the municipality continues to get bailed out.
- National standards should be developed for the design and placement of infrastructure to avoid damage from flooding and other hazards. Communities that adopt these minimum standards should receive increased Public Assistance.
- Federal financial assistance for flood losses should be based upon the individual’s demonstrated willingness to mitigate the risk. The ASFPM believes that flood insurance is the best means of accomplishing this. For example, those living in identified flood hazard areas should not receive disaster assistance if a flood insurance policy was not in place at the time of the flood. Additional mitigation grants should be made available to holders of flood insurance policies on primary residences and commercial structures who take steps to mitigate their flood risk. The premiums on structures with repetitive losses and on those that are not primary residences should reflect the actual risk.
- Similarly, the non-federal share of disaster assistance costs should be reduced in communities where state and local efforts are mitigating the flood hazard. Proposals before Congress have suggested penalizing communities that do not achieve a minimum standard, but an incentive program makes more sense both politically and from a public policy standpoint.
- Federal incentives and programs for farmers like the Conservation Reserve Program, the Wetlands Reserve Program, and permanent easements, are vital financial assistance in the development of sustainable uses for floodprone lands. These types of incentives should be continued and generously supported. Highly subsidized crop insurance and flood disaster payments on floodprone agricultural lands are neither sustainable nor sensible. Agricultural properties subject

to repetitive flooding should be denied subsidized insurance and flood disaster payments if their owners turn down offers to purchase permanent easements.

- For states and localities, programs for flood control structures, nonstructural flood measures, mitigation, and flood disaster assistance should all be based on the same, sliding cost-sharing formula for federal assistance. A minimum cost-share would be available to all localities but the federal share would be increased for communities and states that engage in disaster-resistant activities exceeding minimum criteria and that are implementing strong mitigation programs. After a flood disaster, Public Assistance under the Stafford Act should be withheld from the damaged floodplain areas of communities not enrolled in (or not in compliance with) the National Flood Insurance Program.
- All taxpayer-funded flood disaster relief should be contingent upon taking flood mitigation action.
- The federal government should set an example by enforcing appropriate restrictions on floodplain lands it leases, and terminating those leases on schedule. In some areas of the nation, buildings exist on floodplain lands leased from the Corps of Engineers. These leases were intended only to “live out” the original landowners and then expire, and they included clauses specifying that neither flood insurance nor flood disaster relief would be available to the owners. A further condition was that the buildings were not to be converted into permanent homes, although most of them have been. However, because of political pressure, hundreds of these properties receive flood insurance claims payments and disaster relief, and leases are being renewed because Congress will not allow the Corps of Engineers to terminate them. In Illinois, these properties make up a significant proportion of the state’s repetitive loss properties.

INDIVIDUAL ACCOUNTABILITY

Attempts to resolve the problem of rising flood losses should focus on promoting sound investment decisions by individuals. The most significant national impact will be realized through millions of individual decisions and actions rather than through a handful of government decisions and actions, even though each of the latter may be larger in scope.

- Federal monetary assistance for individuals should be based upon whether they had a flood insurance policy before the disaster, even if their property lies outside of the 1% chance floodplain. The total amount of assistance received by an individual should be reduced (or a portion of it converted to loans) to reflect the amount of damage that could have been covered by a flood insurance policy.
- Those who use their flood insurance claim payment for mitigation should be further rewarded by receiving an additional increment of support in the form of a grant.
- Owners of secondary homes should pay flood insurance rates based on the actual risk to that structure, should be responsible for the structure's recovery and repair costs after a flood disaster, and should bear the full cost of mitigation measures for that structure.

STATE AND LOCAL CAPABILITY

Traditional flood protection programs have resulted in heavy reliance on federal planning and implementation with little or no consideration given to building local and state capability. (An exception is the National Flood Insurance Program.) This arrangement was fairly effective when federal funds were abundant, the construction of flood control works was widespread, and our view of damage prevention was narrower. But future federal budgets will no longer support this approach on a wide scale. Further, local involvement and impetus is essential for a truly sustainable approach. Flood protection in the future will be a state and local initiative, and federal policy must shift and recognize the need to support and build that capability. The federal-state-local relationship must be modified to reflect current and future policy needs and budget realities.

The role of the state government is to provide, as necessary, policy development, technical assistance to communities, coordination, and prioritization and integration of floodplain management issues within that state.

- In order to provide adequate assistance in building strong local programs, and to meet these other goals, states should develop, fund, and implement adequate technical and financial assistance efforts. These should include but not be limited to ongoing coordination of National Flood Insurance Program activities within each state. States thus should come to view the Community Assistance Program only as an auxiliary funding source; and the Community Assistance Program itself should encourage less oversight and more long-range planning and mitigation initiatives.
- States should expect to help their communities incorporate floodplain management into other community processes.
- States should combine resources for disaster response by joining existing regional emergency compacts.
- Qualified states should perform and administer floodplain mapping programs for the Federal Emergency Management Agency, administer the Hazard Mitigation Grant Program and the Flood Mitigation Assistance Program, and conduct environmental reviews for mitigation projects.
- States and communities should be encouraged to develop the capability to do their own engineering studies and reviews, such as reviewing Letter of Map Revision submissions. Incentives are needed for states to develop strong dam safety initiatives and integrate them with their flood hazard programs.
- Encouragement and support should be given by federal agencies and states to professional certification programs for floodplain managers, adjusters, agents, and others.

Local governments must become the focus of hazard mitigation efforts. Using comprehensive local plans that consider the entire watershed and address multiple community issues and concerns is the best way to promote appropriate use of floodprone lands.

- Local governments need to better integrate floodplain management regulations into their overall land use and development plans.

- Mitigation funds should not be available to a locality unless it has in place a comprehensive mitigation plan. Communities must be provided with the tools, responsibility, rewards, and a workable process through which they can move toward sustainable floodplain management with the participation of their citizens, the private sector, and non-governmental organizations.
- The successful activities of communities that participate in the Community Rating System of the National Flood Insurance Program should be publicized and shared.

Managing State Concept

A “managing state” arrangement has been pilot tested under the Federal Emergency Management Agency’s Hazard Mitigation Grant Program to enable those states that are capable and willing to assume a stronger management role in the program. Managing states enjoy greater autonomy and flexibility within the program, receiving funds up front rather than on a project-by-project basis. These changes are expected to expedite the Hazard Mitigation Grant Program process and obligation of funds to projects, and also reduce the number of structures at risk by funding only the best projects. The Federal Emergency Management Agency recognizes that it is not realistic to expect to add more federal staff to facilitate community mitigation. The move to a Federal Emergency Management Agency/state collaborative effort is essential, and building state capability in order to assist communities is an integral part of an effective solution.

- The Federal Emergency Management Agency’s “managing state” concept should be viewed and developed as an incentive to gain broader and increased state involvement and commitment in mitigation. Incentives can range from funding cost shares to more independence, and should be built into the concept.
- The “managing state” concept should be expanded to other Federal Emergency Management Agency programs (like the Community Assistance Program, discussed below) as an incentive to build state capability.

Community Assistance Program

Under the Community Assistance Program, states receive funds to provide assistance to communities for achieving and maintaining National Flood Insurance Program compliance. Community Assistance Program funds can and should be used to conduct flood mitigation and technical assistance activities that support the goals of the National Flood Insurance Program. However, those funds should not be the sole source of financial support for state National Flood Insurance Program operations.

- States should view the Community Assistance Program as an auxiliary funding source for ongoing National Flood Insurance Program coordination within their broader floodplain management programs.
- To further build state capability, the “managing state” concept could be extended to the Community Assistance Program, and funding for that program should reflect annual inflationary increases.

- The Community Assistance Program needs to be revisited because, although it has provided products for the Federal Emergency Management Agency, it has tended to replace state capabilities rather than encourage states to develop more of their own capacity.

State and Local Mitigation and Planning

Local planning for floodplain management and mitigation needs to be better emphasized and supported. Localities that have taken the initiative to analyze alternatives and implement their best options should be recognized. Floodplain management planning credited by the Community Rating System is used by many communities as a model for developing mitigation plans.

Experience indicates that the best floodplain mitigation occurs in the states that have strong programs. Floodplain management is not unique in this regard. Environmental programs like those established pursuant to the Clean Water Act, the Coastal Zone Management Act, and others, demonstrate that using federal leadership to build state and local capability and resources is an efficient way to achieve public policy goals. These experiences indicate that state direction and initiative needs to be fostered. The top-down planning and implementation process of existing flood protection agencies does not build standing capability within a state, and will result in continuing reliance on the federal government to provide technical plans and funds. To build and support this capability the following ideas should be considered.

- The Federal Emergency Management Agency's Comprehensive Cooperative Agreement funding should be reallocated to include mitigation planning in times other than post-disaster settings.
- The Community Assistance Program needs to be redesigned to encourage less oversight and more long-range planning and project development.
- Technical and financial support and other incentives need to be developed at the state and federal levels to encourage other communities to undertake their own mitigation activities.
- Technical assistance programs like the Corps of Engineers' Flood Plain Management Services and Planning Assistance to States Program, which provide precise technical input into overall state mitigation strategies, should be expanded and receive continued support.

Community Rating System

The Community Rating System was established by the Federal Emergency Management Agency as an incentive mechanism aimed at recognizing and encouraging exemplary community floodplain management that exceeds minimum National Flood Insurance Program standards. Flood insurance premiums are lowered to reflect reduced flood risk resulting from community activities that meet the three goals of the Community Rating System: reducing flood losses; facilitating accurate insurance rating; and promoting the awareness of flood insurance. The 900 communities that participate in the Community Rating System today represent 65% of all National Flood Insurance Program policyholders nationwide. Policyholders in Community Rating System-participating communities receive premium discounts ranging from 5 to 25%. (Discounts up to 45% are available, although no community has reached that level yet.) A recently completed multi-year evaluation of the Community Rating System yielded numerous avenues for improvements in the program's operations, and a generally favorable overall approval rating among local officials.

Although it is not perfect, the Community Rating System is a good example of a federally based program that offers incentives to localities for undertaking floodplain management activities. It has been shown to be effective in encouraging new local initiatives and maintaining existing ones. Every nonstructural measure discussed in this paper is rewarded to some extent by the Community Rating System.

- States should encourage and assist their communities in joining, maintaining, and improving their standing in the Community Rating System, to increase local capability.
- The successes of the local programs of Community Rating System-participating communities should be publicized and transferred to more communities.
- The Federal Emergency Management Agency should consider identifying certain Community Rating System activities and phasing them in as additional standards and requirements for community participation in the National Flood Insurance Program.
- Ways to streamline the Community Rating System should be sought continually.

Project Impact

Project Impact is a recent initiative developed by the Federal Emergency Management Agency that fosters many of the sort of far-reaching mitigation approaches that the ASFPM has called for in the past. Among other techniques, Project Impact combines establishing partnerships between the public and private sectors, leveraging resources and energy, and making mitigation a standard part of community planning. Through it, the Federal Emergency Management Agency challenges communities to protect families, businesses, and communities by reducing their susceptibility to all types of natural disasters. Project Impact is based on three premises. First, mitigation is a local issue, best addressed by a local partnership of government, business, and private citizens. Second, private sector participation is essential to comprehensive solutions, because floods and other disasters threaten the economic and commercial growth of localities. Finally, mitigation is a long-term effort that requires long-term investment.

- Project Impact should be continued and strengthened to promote more pre-disaster mitigation and sustainability in communities throughout the nation. The initiative's underlying concepts should be adopted in other federal and state programs.

COORDINATION, OVERSIGHT, AND EVALUATION OF PROGRAMS

Water resource issues are inextricably linked, and efficient accomplishment of agency mandates requires coordination and collaboration among agencies. When Congress passed the National Flood Insurance Act of 1968, it anticipated the gradual development of a broader, nation-wide effort to reduce both flood damage and the loss of natural floodplain functions. The periodic progress reports from the Administration to Congress required under the Act (the most recent was in 1994) all have been titled *A Unified National Program for Floodplain Management*, and discuss the “program” as though it were a distinct, viable initiative. In reality, however, the Unified National Program has suffered from lack of high-level attention from past administrations. The United States has no unified national program for floodplain management in practice. This stems in part from ambiguity in national

goals, and from Congressional direction that yields diffusion of responsibility among levels of government and agencies that results in uncoordinated, fragmented, inconsistent, and duplicative efforts, gaps in program delivery, and missed opportunities. The Unified National Program was recently reshaped by professionals with the ability to direct a limited number of meagerly funded programs, but without sufficient authority to bring about widespread policy change. If its goals are to be met, the Unified National Program must be elevated within the Administration.

- A water resources coordinating mechanism needs to be re-established at a high level within the federal government. It could include responsibility for the Unified National Program for Floodplain Management, and have oversight to ensure that all federal policies and programs are supportive of the National Flood Insurance Program. Upgraded Executive Orders or other measures are needed; they should tie flood disaster relief and other federal funds to a community's participation in and compliance with the National Flood Insurance Program, as well as to the maintenance of flood insurance.
- Another alternative would be to assign responsibility for the Unified National Program to the Office of Domestic Policy in the White House, where there could be executive management by senior administration officials, with existing agency staff developing policy regarding the work products.
- A National Floodplain Management Policy should be established. It should include a national riparian zone policy of protecting, maintaining, and restoring riverine areas in order to preserve them as sustainable ecosystems for future generations. Buffer zones along rivers, streams, and smaller waterways need to be encouraged. The Continuous Conservation Reserve Program could be converted to a permanent nationwide easement program for riparian buffers. Emphasis should be placed on maintaining the natural flood storage capacity within all watersheds.
- A coordinated, watershed-based, multi-objective approach for all water resource activities must be adopted. It should include coordination with water quality improvement efforts, the creation and maintenance of upland storage, and coordinated planning among upstream, downstream, rural, and urbanized localities within the same watershed.

There remains a need for a comprehensive assessment of the effects of various policies and programs on both quantity and quality of floodplain occupancy. Such an evaluation has been missing for a long time. It is easy to point to specific outcomes of limited policies or programs, but still lack careful appraisal of the full array of policies and programs on entire communities. Until that is done, any broad evaluations will be incomplete and perhaps misleading. An integrated and comprehensive approach would allow the Federal Emergency Management Agency to diagnose and prescribe modifications for Congressional and administrative changes that will benefit the nation's taxpayers, those who are at risk to flooding, and those who will purchase land and structures that may be at risk. It should be remembered that the drafters of House Document 465, which culminated in the creation of the National Flood Insurance Program, warned that any new program—like the national flood insurance effort they were then proposing—should be tested in sample areas before widespread implementation. That preliminary testing was never done. Thus, 30 years later, we are deeply committed to a course of action that was never proven to be a permanent solution to the nation's flood problems.

- The National Flood Insurance Program has never been thoroughly evaluated. A comprehensive assessment of its effects on resource use, economics, and occupancy of the floodplain should be undertaken soon. A pilot test in two counties of a method to assess changes in floodplain occupancy and contributing factors was completed in late 1999, and its results should be examined carefully with an eye toward a larger effort.
- The Hazard Mitigation Grant Program should be evaluated, to determine the kinds of mitigation measures that are being funded and implemented, and whether they really are reducing losses and protecting floodplain resources.
- Likewise, a compilation of Flood Mitigation Assistance Program projects needs to be done, followed by an analysis of their impacts, to establish future program priorities.
- Periodic reviews also should be done of state and local floodplain management policies and programs, to identify what successes have been achieved in certain states and locales, what contributed to that success, and how they could be duplicated elsewhere.

Executive Order 11988 Enforcement

Executive Order 11988 directs federal agencies to comply with wise floodplain management practices. Although on its face it is a powerful mandate, Executive Order 11988 seems to be receiving only marginal compliance as federal agencies fail to adhere to its spirit and letter, and continue to locate or fund non-floodplain-dependent activities in floodplains and thereby putting these investments at considerable risk.

- Compliance with Executive Order 11988 should be overseen and enforced by a specific entity within the Administration.
- Alternatively, a new Executive Order should be issued, with an expanded scope and mechanisms for enforcement and accountability. This would reaffirm the federal government's commitment to floodplain management.

Funding Mechanisms

Reliable and ongoing funding must be made available for programs, entities, and activities that foster partnerships, state and local capability, and sustainable approaches to floodplain management. For example, funds for implementing mitigation must extend beyond the post-disaster period, and beyond the federal planning process (which can last 20 years).

- Adequate funding should be provided for initiatives that support all aspects of floodplain management, including data collection, forecasting, geographic information systems, mapping (including the Federal Emergency Management Agency's Mapping Modernization Plan), scientific research, and analysis.
- Generous and reliable funding is needed for programs that have the most promise for long-term impact. These include technical assistance programs like the Corps of Engineers' Flood Plain Management Services and its Planning Assistance to States Program; mitigation initiatives like the Flood Mitigation Assistance Program, which is not restricted to the post-disaster setting; and

programs to purchase permanent easements like the Natural Resource Conservation Service's Wetland Reserve and Watershed Protection programs. In addition, the Administration should ask Congress to declare Flood Mitigation Assistance funds to be non-federal, because they are non-tax dollars. They are flood insurance policyholder dollars and, when considered as such, could be leveraged for more flood mitigation activities.

- Explicit separate authorities for nonstructural flood protection projects should be developed. The inherent bias towards flood control in many agencies generally will skew proposed mitigation measures away from nonstructural alternatives. The 1999 Water Resources Development Act provided such authority to the Corps of Engineers under the Flood Mitigation and Ecosystem Restoration initiative. Similar authorities should be established for other agencies such as the Natural Resources Conservation Service, the U.S. Department of Housing and Urban Development, and the Bureau of Reclamation.
- For nonstructural projects, land and easements should be considered part of the total project cost, not a local sponsor requirement. Economics sometimes dictate that non-federal sponsors choose the alternative with the lowest non-federal cost. Due to the high cost of land in many areas, the large amount of land needed for some nonstructural projects, and the variations in how the cost of a project is shared, the alternative with the lowest non-federal cost is often a structural one.
- Structural, nonstructural, and disaster assistance programs should all be based on the same, sliding cost-sharing formula for federal assistance. Under this concept, a minimum cost-share would be available to all, including communities without financial resources to undertake expensive projects. But the federal share would be increased for communities and states that engage in disaster-resistant activities beyond minimum criteria and that are implementing strong mitigation programs, such as mitigation planning, factoring hazards into the design and construction of new public infrastructure, requiring hazard disclosure in property transfers, creating economic incentives for retrofitting vulnerable buildings, adopting building codes, and identifying and insuring at-risk public buildings. Under the current arrangement, assistance appears to go more freely to localities that have made little or no effort, because they sustain more damage.
- The Hazard Mitigation Grant Program's review and approval process is greatly improved under the "managing state" concept and in general. The ASFPM urges the Federal Emergency Management Agency to continue to improve and streamline this process, delegating as much as possible to the states, so that federal expertise and funds can be used more efficiently.

DISASTER MANAGEMENT AND ASSISTANCE

Historically, disaster programs in the United States have been directed at restoring people back to "normal" as quickly as possible. Unfortunately, in our rush to return people to normal, we have also restored them to their previous at-risk condition. It will always be necessary for the federal, state, and local governments to have programs to administer assistance after disasters. The ASFPM believes that disaster aid and the post-disaster recovery period should be used as much as possible to encourage, facilitate, and reward actions that are lessening the potential damage from future floods, and building overall local sustainability.

However, under many current policies, post-disaster rewards are still provided for those who did no mitigation before the disaster. In other cases, programmatic complexity or financial reality makes it

more attractive to restore to an at-risk condition than to mitigate the danger. A concerted effort must be made to improve the manner in which disasters are managed and disaster assistance provided. Government efforts must be efficient without fostering moral hazard.

The bulk of federal disaster assistance is provided for the repair and rehabilitation of public infrastructure (roads, bridges, stormwater systems, utilities, etc.) after a disaster. This assistance comes in the form of funding for repairs through the Federal Emergency Management Agency, levee repairs by the Corps of Engineers and the Natural Resources Conservation Service, and activities like channel clearing. A smaller portion goes to individuals and families for emergency needs and for repairs to residences.

- Disaster aid awarded to localities for public infrastructure should be contingent upon the community's participation in and compliance with the National Flood Insurance Program. Such economic sanctions applied to local governments should result in wiser decisions being made at the local level about investment in the floodplain, siting critical facilities, and insuring public structures.

IMPROVING EFFICIENCY AND EFFECTIVENESS

In most disasters numerous federal agencies direct funding and programs toward the stricken area. It is frustrating to witness that a coordinated strategy does not evolve, but rather each agency pursues its own priorities, implements its own application procedures, and follows its own rules. A recent Office of Management and Budget compilation of federal disaster programs lists 34 separate programs in 24 agencies for nonstructural disaster recovery assistance alone. Although the Federal Emergency Management Agency in general has done a remarkable coordination job in the last several years, considerable energy can be lost trying to coordinate specific procedures and policy among agencies or levels of government—for example, whether a house is to be valued by its pre-disaster market value or its damaged market value.

- The Federal Emergency Management Agency should continue to work with all federal agencies to ensure that all policies and programs are supportive of the floodplain management standards embodied in the National Flood Insurance Program. Upgraded Executive Orders or other measures may be needed; they should tie disaster relief and other federal funds to National Flood Insurance Program participation, compliance, and the maintenance of flood insurance.
- A revised federal response plan should be developed that not only details standard response but also directs the use of disaster funds that are viewed as discretionary.
- A uniform set of application forms covering many or all programs would facilitate implementation.
- The availability of post-disaster Public Assistance and Individual Assistance ought to be reviewed to ensure consistency with the spirit of Executive Order 11988's directive to curtail federal support to any activity that creates, continues, or otherwise supports activities that may result in future flood damage.
- A set of emergency rules should be adopted that covers programs in all agencies so that issues of funding, cost sharing, priorities, and the like are handled consistently.

- The administration and oversight of the Hazard Mitigation Grant Program should eventually be turned over to qualified states (see discussion in section on State and Local Capability, above.)

FLOOD FIGHTING

Independent flood fighting activities on the levees during the 1993 flood led to sandbagging that caused damage at other sites along the river, and to sabotage. Flood fighting either saves or damages property, depending on one's perspective.

- Leveed rivers touching multiple states—like the Mississippi—should have a flood fighting plan in place, with federal oversight for implementation, and a National Guard presence for enforcement.

INTERPRETATION OF FORECASTS

River forecasts are increasingly being made available to the general public. These forecasts should explicitly state the variability of estimates so that individuals do not get a false sense of security, but instead pursue appropriate protective actions, just in case. The 1997 floods in Grand Forks, North Dakota, taught a valuable lesson. The National Weather Service has undertaken a demonstration project in Iowa to test the feasibility of issuing forecasts with variability stated. The ASFPM, while supportive of this, urges caution in releasing warnings that are confusing or may have the effect of delaying appropriate action—like evacuation. It is extremely important that federal agencies speak with one voice in the issuance of such forecasts and warnings.

- Better ways need to be found to convey to the public the uncertainties associated with weather and flood forecasts, and to help people understand their risk and take appropriate action to prepare for and avoid such hazards.

ACTING ON FLOOD WARNINGS

Many local governments are developing flood warning and monitoring systems. Despite vast differences in program components, there is one common frustration: the difficulty of progressing beyond collecting and monitoring data to actually evacuating people and property during a flood threat.

- The National Weather Service, in partnership with state and local governments and other federal agencies, needs to find ways to better integrate and utilize this data and develop better ways to disseminate information to people at risk in a way that causes them to understand their risk, personalize it, and then take appropriate and timely action.
- The ASFPM should incorporate the issue of flood warnings into its organizational structure and committee work.

THE RESPONSE—RECOVERY CONTINUUM

There is no question that after a disaster, all levels of government must respond as swiftly as necessary for the safety and welfare of those affected. It is during the later, recovery phase that there must be a rational pause to avoid missing the many opportunities presented. All mitigation is meaningful only in the context of the hazard looming somewhere in the future. Science can reasonably assure us of the locations of flood hazard areas that, in the absence of mitigation, will certainly become the settings for future disasters. Therefore, all efforts toward recovery must make an intelligent assessment toward seizing mitigation opportunities wherever they present themselves.

- Any taxpayer-funded disaster relief must be tied to requirements for mitigation. Some mitigation is required as a condition of receiving relief under some programs now, and in some situations, but it should be made a much more universal and stringent requirement (see discussion in Partnerships and Incentives, above).
- The availability and amount of post-disaster financial assistance could be used to support National Flood Insurance Program compliance. Two options include having communities require damaged buildings to be upgraded to flood hazard mitigation standards as a condition of receiving disaster assistance; and allowing communities to determine permits and damage before providing mitigation funds and other disaster relief.

STATE ASSISTANCE PACTS

Mutual assistance pacts among states can improve national response by ensuring that trained professionals are available to supplement an already-taxed federal staff. Some issues need to be resolved before such pacts can be put into widespread use. Who authorizes and pays for the personnel sent to another state? Will the Federal Emergency Management Agency modify existing state contracts for the production of plans and products? Who will bear the liability, if any, for the advice and actions of local, state, and federal staff operating pursuant to a mutual assistance pact?

- As recommended by the Western Governors' Association's 1997 "Action Plan for Reducing Flood Risk in the West," states should combine resources for disaster response by joining existing emergency compacts or by forming new ones. Many states have already joined the Emergency Management Assistance Compact first proposed by the Southern Governors' Association and endorsed by the Western Governors' Association. There are also regional compacts, such as the Southwest Caucus, and new forms of mutual assistance can be explored.
- States should adopt indemnification policies for professional engineers, code officials, and others who volunteer their time and expertise during disasters.

INSURANCE

Insurance can be a useful tool in coping with flood hazards, primarily because it has the effect of spreading the cost of flood damage to those who are bearing the risk. In addition, insurance can be undertaken at the individual level, and has the potential, through premium reductions and other techniques, to act as an incentive to adoption of mitigation measures.

FLOOD INSURANCE

The instigation of the National Flood Insurance Program in 1968 marked a significant shift in public policy. The National Flood Insurance Program was the vehicle that brought floodplain management to the nation. The potential strength of the National Flood Insurance Program derives from the local-state-federal partnership it fosters and its “quid pro quo” arrangement, whereby minimum land use management and performance criteria must be adopted and implemented by localities in order to be eligible for flood insurance and other continuing federal benefits.

Flood insurance can be a highly effective mechanism for fostering individual responsibility and building local self-sufficiency, thereby contributing to sustainable and disaster-resistant localities. From a federal policy perspective, flood insurance is attractive because it minimizes the amount of taxpayer funds that must go to “bail out” people who have chosen to live in hazardous areas. Instead, insurance claims are paid from a pool funded by people who are taking the risk of living in floodprone areas.

Land Management/Flood Insurance Interaction

The premise of the National Flood Insurance Program is that the federal government will make flood insurance available if the local government enforces land use and construction practices that minimize the threat of flooding. Two notable exceptions to this general rule are in coastal erosion zones and in areas that are subject to flood risks but lie outside of Special Flood Hazard Areas (mapped floodplains).

Flood insurance is available at reduced rates for structures outside of mapped floodplains, but there are no management measures required of the community for these areas. In addition, in certain coastal areas insurance is available, but there are inadequate regulatory standards and premium payments do not account for erosion, which can cause significant damage. Experience indicates that many who purchase insurance in these unmapped floodplains are subject to an inherent flood risk. This represents a potential drain on the flood insurance fund with no opportunity to modify existing construction or to regulate the construction of additional at-risk structures.

- Consideration should be given to making flood insurance available only in mapped floodplains—the idea being that citizens in unmapped but floodprone areas would demand that their areas be mapped so that they would be eligible for flood insurance. Once they are mapped, they would be subject to regulation.
- An alternative would be to require that, when a flood insurance damage claim is filed for a structure outside of a mapped floodplain, the area be designated as a floodplain and the community notified of the need to manage this newly mapped area.
- In cooperation with its partners and others, the Federal Emergency Management Agency should establish a work group to review and revise the regulatory standards of the National Flood Insurance Program (see section on Nonstructural Measures, above). The review should address a zero-rise floodway; freeboard above base flood elevation to the first floor; elevation certificates for all new floodprone construction, including placement of manufactured homes; flood protection standards for critical use facilities; clear standards and procedures for determining substantial damage and improvements; requiring some continuing regulatory protection behind

levees and below dams; and developing alternatives to basements in floodplains, especially in wind hazard areas.

- The National Flood Insurance Program should be modified to provide an insurance policy benefit for coastal erosion and mudslides only where those hazards are clearly mapped and regulated.
- A better way should be found to determine flood risk for flood insurance purposes, so that information useful for community planning and floodplain management can be left on flood maps.
- Floodplain managers and the insurance industry should continue to improve their working relationships. State and local floodplain managers are in a good position to advise citizens about the basics of insurance availability and to promote the wisdom of the land management/insurance interaction of the National Flood Insurance Program. Continued efforts should be made to educate floodplain managers about the insurance aspects of the program, and insurance agents about floodplain management.
- Encouragement and support should be given by federal agencies and states for professional certification programs for floodplain managers, adjusters, agents, and others.

Waiting Period

As recommended by the ASFPM and others, the waiting period for a flood insurance policy to become effective was lengthened from five to 30 days under the National Flood Insurance Reform Act of 1994, thus discouraging the practice of some individuals of waiting to purchase a policy until a flood forecast was issued.

- The ASFPM continues to support the 30-day waiting period.

Flood Insurance Premium Discounts

There exist a number of inequities with current flood insurance premiums. Three types of discounts (subsidized by other premium payments) are notable, but it must be remembered that all three are internal to the National Flood Insurance Program, that is, paid for by other flood insurance policyholders and not by federal taxpayers.

First, because the National Flood Insurance Program is a national program, the nation-wide actuarial rates based on risk may not reflect the true risk in a given location. The effect is an unintentional discount resulting from the fact that not all flood hazards are equal—differences in precipitation patterns, flood depths and velocities, topography, and channel conditions produce differing ranges of hazardousness.

The second, most well-known discount is the grandfathering that results in lowered pre-FIRM (that is, before the issuance of the community's Flood Insurance Rate Map) insurance rates (now being studied by the Federal Emergency Management Agency). For the purpose of determining flood insurance premiums, buildings are categorized and rated as either pre-FIRM construction or post-FIRM construction. The post-FIRM rates are for those structures built after flood hazard mapping was done and the communities or counties passed the necessary ordinances and instituted accompanying permitting systems with development standards. The pre-FIRM rates are for those

structures that were built before the community or county joined the National Flood Insurance Program. Usually these buildings were constructed without taking account of flooding and are therefore at higher risk than those constructed according to floodplain management regulations (post-FIRM construction), but the National Flood Insurance Fund subsidizes the pre-FIRM insurance rates to keep them relatively affordable. The original idea was that over the long run the older buildings would reach the end of their design life and gradually be replaced by flood-resistant construction. In practice, this is taking longer than anticipated. Meanwhile, the expectation has grown that people who live in high-risk areas should pay actuarial insurance rates based on their exposure to risk. The Federal Emergency Management Agency is studying this issue to determine the feasibility of ending this discount.

The third type of discount is the administrative grandfathering that occurs when a building is constructed in compliance with the local standards as based on the Flood Insurance Rate Map in effect at the time of construction. If the map is subsequently updated and the building's flood zone is changed, the structure is still subject to the rate appropriate to its originally designated zone.

- The Federal Insurance Administration should continue to work to ensure equity in the discounts, particularly that provided for administrative grandfathering.

Repetitive Losses

When insurance claims are filed again and again for flood damage to a single building, that building becomes known as a “repetitive loss structure.” There are relatively few insured structures in this category, but they account for a disproportionately large share of all the flood insurance claims filed and paid. While estimates vary, it appears that 2% of the policies held under the National Flood Insurance Program since its inception have accounted for 32% of the losses and received 38% of the dollars paid out from the National Flood Insurance Fund.

Geographically, many of these losses are concentrated in the Gulf Coast states. As reported in its 1998 publication, *Higher Ground*, the National Wildlife Federation reviewed repetitive loss data and identified 300 communities as top candidates for mitigation opportunities in light of their extraordinary flood loss histories. “These 300 communities, located in 35 states, represent only 1.6% of the 18,700 communities enrolled in the National Flood Insurance Program. Their 31,574 repetitive loss properties are less than 1% of all National Flood Insurance Program insured properties. Yet, from 1978 to August 1995, the repetitive loss properties in these communities received approximately \$1.3 billion in flood insurance payments—49.8% of all National Flood Insurance Program repetitive loss payments and 20% of all National Flood Insurance Program loss payments nationwide.”

The pre-1999 strategy for alleviating losses due to repetitively flooded buildings relied on the structure's being substantially damaged, at which time it would be reconstructed, elevated, or floodproofed to prevent future damage. Unfortunately, due both to confusion about how “substantial” damage (or substantial improvement) should be measured, and also to a natural reluctance on the part of local officials to impose perceived hardships on owners of flood-damaged properties, communities have not been consistently declaring structures “substantially” damaged when in fact they are. This has resulted, over time, in buildings being repeatedly flooded because they are never declared by the community to be substantially damaged and thus are not upgraded (nor do their owners qualify for Increased Cost of Compliance payments under their flood insurance policies, which would help them pay for mitigation measures). According to the Federal Emergency Management Agency, 8300

buildings nationwide have had four or more losses, or more than two losses that cumulatively equalled or exceeded the building's value.

A comprehensive strategy is being developed by the Federal Emergency Management Agency to address the repetitive loss problem, in cooperation with its partners such as the ASFPM, the National Emergency Management Association, Write-Your-Own insurance companies, claims adjusters, and others. The Federal Emergency Management Agency has taken several important programmatic steps in this direction, including incorporating special incentives into the Community Rating System for repetitive loss communities, distributing data to states and communities to help them address their repetitive loss properties, considering increased insurance rates for repetitive loss structures, and specifically targeting Flood Mitigation Assistance Program funds toward repetitively flooded properties. The latter strategy would focus on about 10,000 high-risk repetitive loss structures for mitigation, with an eventual estimated National Flood Insurance Program savings of \$65 million annually. Further, some states are using Hazard Mitigation Grant Program funding to implement mitigation measures for their repetitive loss properties. Additional needed policy changes are being considered, including those listed below.

- Authorization of a provision for mitigation insurance that would include conditions to deal with repetitive loss structures.
- Redefining “substantial improvement” under the National Flood Insurance Program so that improvements to a structure over time are treated cumulatively, rather than each improvement being considered individually. The National Flood Insurance Program should require communities to adopt the cumulative improvement language.
- In cooperation with its partners, the Federal Emergency Management Agency needs to develop a clear position on whether “replacement cost” or “market value” should be used when substantial damage or improvement is evaluated. In general, the ASFPM has found that replacement cost is a better standard in coastal areas, while market value works better in riverine locales.
- Repetitive losses could be financially neutralized by moving to actuarially based premiums and/or deductibles on such structures and adjusting coverage unless mitigation measures (including dry and wet floodproofing) are undertaken. If cost-effective and feasible mitigation options are refused by a property owner, premiums for that structure should be increased.
- The repetitive loss structures database needs to be cleaned up (perhaps using State National Flood Insurance Program Coordinators) to include data to show the risk and reason for flooding of each structure and to verify building locations.

Increased Cost of Compliance Insurance

New insurance coverage for Increased Cost of Compliance became effective in May 1997, authorized under the 1994 Flood Insurance Reform Act. This coverage will reimburse a flood policyholder for at least part of the additional cost to rebuild or otherwise mitigate a flood-damaged structure to comply with state and local floodplain management laws. The Federal Emergency Management Agency has set the maximum coverage at \$20,000 (effective in May of 2000). In response to ASFPM recommendations, the Federal Emergency Management Agency will periodically review Increased Cost of Compliance claims to determine whether the \$20,000 maximum is adequate. It is estimated

that the average cost of bringing a structure into compliance is about \$57,500. This was arrived at by combining averages for the cost of acquisition, floodproofing, and elevation, and was weighted to reflect construction types found in parts of the country with the highest numbers of repetitively flooded properties. Thus this figure may not reflect the average cost nationwide. A similarly generated average cost for elevation is \$34,400 per structure.

- The Increased Cost of Compliance provision could be made more effective by relaxing the eligibility requirements so more damaged structures could receive Increased Cost of Compliance mitigation funds (after over two years, fewer than 150 structures have qualified for this mitigation help); implementing the third provision of the Increased Cost of Compliance law, which allows the Director of the Federal Emergency Management Agency to impose Increased Cost of Compliance when it is “beneficial to the National Flood Insurance Program Fund;” and encouraging property owners to undertake mitigation by increasing the amount of funding available.

Residual Risk of Dams and Levees

An evaluation of the residual flood risk below dams and behind levees should determine the proper policy regarding insurance requirements and rates. Given the potential for catastrophic losses from failure, these residual risk areas might best be classified with something other than the standard B, C, or X Zones. A special residual risk zone might provide for the implementation of the mandatory insurance purchase requirement, or might allow for appropriate rates, or both, to reflect the hazard.

- The failure zones of all dams, levees, and floodwalls should be identified on all flood maps. Flood insurance in these zones should be mandatory, with rates based on the residual risk.

Increasing the Number of Flood Insurance Policies

After 30 years and despite a doubling in the past five years, the number of flood insurance policies is still unacceptably low. Nationwide, only about 25% of structures in flood hazard areas are covered by flood insurance. This is partly due to a lack of understanding of both the flood risk and the insurance offered and, until recently, minimal enforcement of the mandatory purchase provisions for flood insurance. Yet the basic premise of using an insurance pooling mechanism to shift the risk of flood damage from all taxpayers to those that have chosen to live at risk is good public policy. Unfortunately, at present there is little recognition of the exposure of individuals and the nation to catastrophic loss due to lack of coverage. As a point of comparison, an at-risk structure in a floodplain will have better than a 25% chance of being flooded by the 1% chance flood at some time during its 30-year mortgage, but there is only a 1% chance that this same structure would have a fire. Yet few, if any, homeowners or lenders would even consider foregoing fire insurance.

Mandatory Purchase

The 1994 ASFPM review document called for mandatory purchase elements of the National Flood Insurance Program to be revised to provide for the escrow of flood insurance premiums; impose penalties on lenders for noncompliance; withhold disaster relief from those who willingly drop coverage; and provide authority for individuals and agencies to sue agents and lenders that fail to enforce the purchase requirements.

These suggestions were largely addressed when the National Flood Insurance Reform Act final rules for regulated lending institutions became effective in 1996. These provisions were largely responsible for increases in the number of policies from 2.2 million to over 4 million (out of an estimated 9–11 million buildings in flood hazard areas nationwide). However, supposedly only 60% of new mortgages are covered by federally regulated lenders (although some of the remaining 40% are sold on the secondary mortgage market and thus eventually must meet the requirement for flood insurance). Another concern is the large numbers of homes that are not mortgaged at all and thus are not required to be insured against flood risk.

- Compliance with the National Flood Insurance Reform Act’s provisions for insurance purchase should be monitored.
- Steps should be taken to bring the estimated 40% of new mortgages that are not federally regulated under the provisions of the mandatory purchase requirement.

Cover America Campaign

Cover America is a nationwide marketing, advertising, and awareness campaign initiated by the Federal Insurance Administration to increase the awareness of and sale of flood insurance. It uses television commercials, print advertising, Yellow Pages listings, consumer mailings, and other public relations efforts. Since its kick-off in October 1995, the Cover America campaign has made solid progress in accomplishing its goals of increasing awareness and motivating flood insurance sales. There have been annual increases in coverage over the last several years. However, the problem of policy retention is still a very real one.

- Retention of the existing policy base should be a focus of any future flood insurance marketing campaign.

CROP INSURANCE

Federal crop insurance protects farmers or ranchers from unexpected production losses from natural causes, including flooding and excessive moisture, and is available for over 64 different crops. Administered by private insurance companies for the U.S. Department of Agriculture, crop insurance is designed to provide producers a financial “safety net” against the risk of major crop loss. The only cost to the producer is an annual processing fee of \$50 per crop per county, up to \$200 per county. The insurance guarantees payment for at least 50% of the producer’s average yield. Higher levels of insurance protection are available under the program for a fee. The U.S. Department of Agriculture also subsidizes the premiums for additional coverage to encourage farmers to take advantage of them. Farmers in floodplains can be expected to take full advantage of this program. In addition, the uninsured crop disaster assistance program provides crop loss protection for growers of many crops when crop insurance is not available or when farmers have decided not to participate in the regular insurance program. When a disaster occurs, producers usually qualify for this disaster assistance program if five or more producers within the affected county or disaster area are affected.

In early 1999, \$2.3 billion was provided as emergency financial assistance to farmers who suffered losses due to natural disasters, including flooding, during 1998. Farmers with eligible losses of insured crops were compensated 65% of what they could have expected to earn if they had been able to harvest the crops. Those that did not have the insurance got 60%, and had to agree to participate in the insurance program for the next two years. In addition, up to \$400 million is being used as an incentive

for farmers to buy higher levels of crop insurance in the future; a 25–35% premium discount on buy-up coverage. The year 2000 budget provided yet another \$400 million for a one-year crop insurance buy-up incentive.

- The ASFPM recommends that agricultural properties subject to repetitive flooding be denied subsidized insurance and flood disaster payments if their owners refuse the U.S. Department of Agriculture's offers to purchase permanent easements.
- Heavily subsidized crop insurance is counterproductive because it discourages agricultural producers from converting marginal agricultural land that is subject to repeated flooding into more appropriate uses—either being left open or planted in alternative crops. This disincentive to wise floodplain use should be discontinued.
- Disaster assistance should be reduced or withheld if crop insurance is not carried by the farmer.

CONCLUSION

This report has described some of the key changes in federal floodplain management policy and programs over the last several years, and has identified those improvements that would help the nation move toward a future that includes sustainable floodplain lands and disaster-resilient communities. The ASFPM has also tried to point out herein specific, achievable ways in which each deficiency can be remedied and how existing successes—of which there are many—can be shared, expanded, and capitalized upon. The ASFPM believes that the implementation of these recommendations will help us all cultivate a holistic perspective, spread responsibility more equitably, and foster sensible attitudes toward the use of hazardous and environmentally sensitive lands. These action items will be the focus of ASFPM effort over the next five years or so, in our work with state and local governments, federal agencies, the insurance industry, individual professionals in floodplain management and related fields, Congress, and our many other colleagues and partners in both the public and private sectors. We invite all those who are dedicated to the future well-being of this nation to join us in working toward an enhanced level of resiliency in the face of flooding, reduced overall flood losses, and a society with a sustainable relationship to its riparian and coastal lands.

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