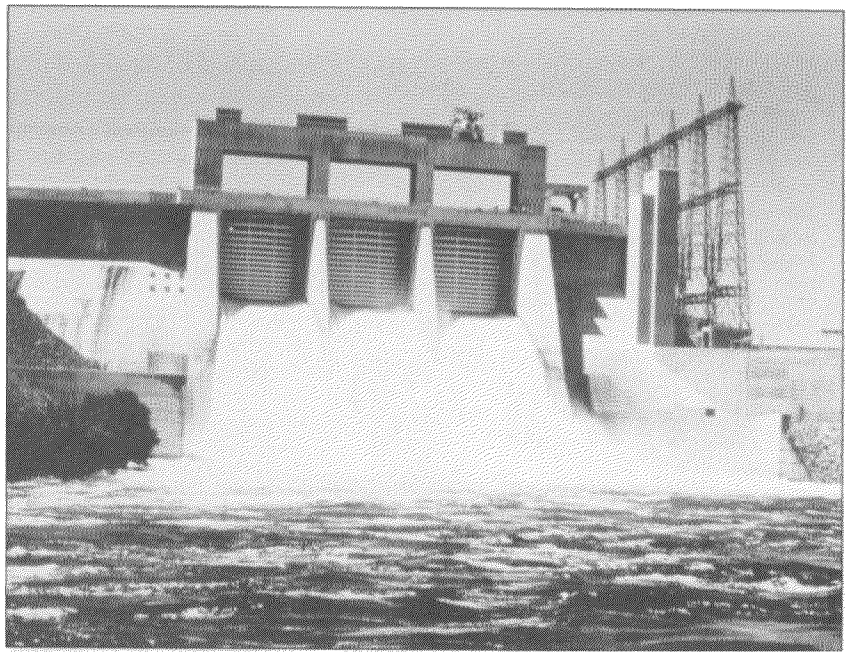
Part II
Managing Floodplains to Reduce Losses



The History of Floodplain Management

Before 1965, government action to reduce floodplain losses was primarily a response to significant loss of life or property damage. Most of these efforts sought to control flooding through structural measures. During the mid-1960s, federal policy began to broaden to include nonstructural means. The last 25 years have witnessed a major expansion in floodplain management, incorporating better ways for analyzing and predicting flooding, paying appropriate attention to the natural resources of floodplains, and adjusting the roles of federal, state, and local governments and the private sector.

1900-1960: The Structural, Federal Era

During the 1800s and early 1900s, flood control efforts were undertaken by levee districts, conservancy districts, other local and quasi-public groups, and individual landowners. Federal involvement was sporadic and concerned mainly with flood impacts on navigation, forestry, or agriculture. After the Civil War, Congress authorized federal agencies to begin stream gaging as a start toward flood forecasting and warning, but federal involvement still was limited.

After two decades of major flooding along the Mississippi, Ohio, Potomac, Susquehanna, and various New England rivers, Congress committed the federal government to flood control of all navigable rivers in the nation in the Flood Control Acts of 1917, 1928, 1936, and 1938. The combined effect of these acts was the federal government's assumption of the full cost of building and maintaining reservoirs and channel modifications, and the placement of most of the responsibility for efforts to control floods in the hands of the Corps These laws did mention other measures for reducing flood damages, such as evacuation, watershed improvement, and reconciliation of needs of upstream and downstream users, but the emphasis was on controlling flooding with such structures as dams, levees, and channel modifications.

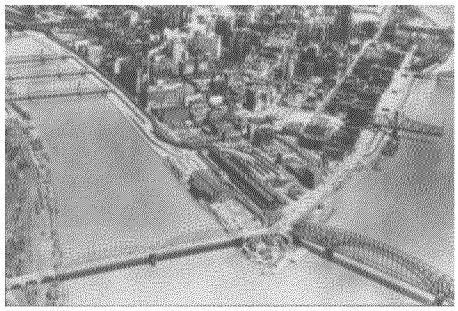
Twenty-five years later the Corps' authorized flood control program encompassed 220 reservoirs (90 million acre feet of flood control capacity), over 9,000 miles of levees and floodwalls, and 7,400 miles of channel modifications—a total of 900 projects with an estimated federal cost of $9 billion. Other federal agencies also became involved in flood control. The Tennessee Valley Authority's regional program of resource development included construction of dams and reservoirs for flood control and other purposes. The Bureau of Reclamation and the U.S. Department of Agriculture began including flood control with other project considerations. During the 1930–1950 period the U S Forest Service established research watersheds to study water yield and timing of flows from forest and range watersheds The Coweeta Hydrologic Laboratory in North Carolina was established in 1934 as the first of these watersheds. The Soil Conservation Service began helping individual landowners in 2,600 soil conservation districts to use conservation measures, including flood prevention.

Along with federal involvement in flood control came federal relief for flood victims. The Federal Disaster Act of 1950 was the nation's first comprehensive disaster relief act, and Small Business Administration disaster relief programs were also begun in the 1950s.

Before the 1960s a number of single-purpose federal laws and programs protected various specific natural resources and thus indirectly helped protect the natural resources of some floodplains. For example, the creation of national parks and federal forest reserves resulted in the protection of significant areas of natural floodplains. Other laws protected wildlife habitat and preserved open space for conservation and recreation, thus ensuring that some floodplain areas would be left in their natural states.

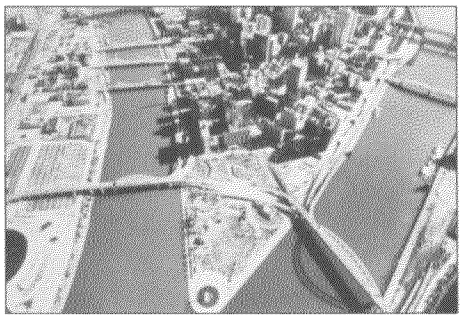
1960s: A Time of Change

Despite the billions of dollars in federal investments in structural projects, and the demonstrated effectiveness of these measures, flood losses and disaster relief costs continued to rise because of unwise occupancy and use of the nation's floodplains. Thus, broader approaches were studied and



In the latter part of this century, the scope of floodplain management broadened to encompass a wide range of techniques. The "Point Area" of Pittsburgh, Pennsylvania, at the confluence of the Allegheny and Monongahela Rivers, demonstrates these advances. For example, the transportation corridor in the foreground has been replaced by an open space park, highways have been elevated, and prominent structures have been floodproofed. These physical changes, along with a comprehensive system of upstream flood control, land use controls, and a coordinated flood warning and preparedness program, have significantly reduced the flood hazard in downtown Pittsburgh.

Above: Pittsburgh, Pennsylvania, Point Area 1948
Below. Pittsburgh, Pennsylvania, Point Area 1982.



Previous page Davis Dam, Colorado River, near Bullhead City, Arizona.

applied, including zoning and other land use regulation, flood forecasting, federal flood insurance, relocation of property, and alternative water storage techniques. Major steps were taken to redefine federal policy. Section 206 of the Flood Control Act of 1960 authorized the Corps to provide technical services and planning assistance to communities for wise use of the floodplain and for ameliorating the flood hazard The Corps began producing maps and floodplain information reports describing a community's flood hazard from a broader perspective. The President's water policy statement of 1962 established policies and procedures for comprehensive river basin plans. The Water Resources Planning Act of 1965 created the U.S. Water Resources Council and authorized federal-state river basin commissions for comprehensive basin planning.

House Document 465, the report of a Bureau of the Budget Task Force on Federal Flood Control Policy, advocated a broader perspective on flood control within the context of floodplain development and use. Executive Order 11296, Flood Hazard Evaluation, directed all federal agencies to evaluate the flood hazard before undertaking federally financed or supported actions and to play a lead role in preventing uneconomic use and development of floodplains. Fifteen states, most notably Wisconsin and Minnesota, adopted floodplain management programs, some of them providing for strict regulation. Local governments also began trying to deal with the hazard in a more comprehensive way, usually with assistance from a state or federal agency such as the Tennessee Valley Authority.

HISTORY OF A UNIFIED NATIONAL PROGRAM FOR FLOODPLAIN MANAGEMENT

House Document 465, *A Unified National Program for Managing Flood Losses,* was submitted to Congress by President Lyndon Johnson in August 1966. It had been prepared by the Task Force on Flood Control Policy at the administration's request in an attempt to slow the mounting national toll of flood losses, unchecked by over $7 billion in national investments in flood control projects since 1936. House Document 465 recognized the need for a unified approach and for new planning measures, and made 16 recommendations for federal agency action to begin implementation of a program—including new legislation, specific studies, and new programs for collecting and disseminating flood-related information.

A Unified National Program, 1976

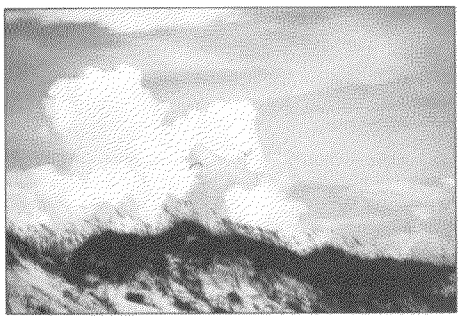
In response to a 1968 Bureau of the Budget request for a report pursuant to a directive in Section 1302(c) of the National Flood Insurance Act, and to a 1975 U.S. General Accounting Office report criticizing House Document 465 and Executive Order 11296, the U.S. Water Resources Council submitted to the President the *Unified National Program for Floodplain Management* in 1976. This revision, whose title change reflected a significant recognition that more than flood losses were involved, established a more detailed framework for the program, described the greatly changed context in which it would be implemented (numerous changes in flood-related federal programs had taken place), and added management strategies and tools for federal, state, and local decisionmakers to use. The report focused on the need for improved coordination, which was cited as the "weakest component of current management efforts."

1979 Revisions to a Unified National Program

Although the 1976 Unified National Program made a significant step forward in floodplain management, its very effectiveness made it quickly dated. Several executive level actions—President Carter's floodplain management policy articulated in 1977, Executive Orders 11988 and 11990, and the President's 1978 water policy initiatives—were soon taken, making the 1976 version obsolete. The Federal Interagency Floodplain Management Task Force updated and refined the Unified National Program in a report submitted by the Water Resources Council to the President in 1979. This revision incorporated federal concern with the "natural and beneficial values" of floodplains, responded to the President's policy directives, expanded the strategies (adding two: restoration of natural values and preservation of natural values), tools, and conceptual framework accordingly, and emphasized the insufficient awareness of alternative strategies due to "lack of adequate technical and procedural information to guide floodplain decision-makers"

1986 Revisions to a Unified National Program

In 1982, the Office of Management and the Budget assigned responsibility for the Unified National Program to the Federal Emergency Management Agency, which assumed chair of the Interagency Task Force. The Task Force submitted an updated Unified National Program in 1986, noting that the 1979 report had become "dated by the relative success and changes in federal programs and by the strengthening of floodplain management capability at the state and local levels" These changes included the use of federal interagency hazard mitigation teams, passage of the 1982 Coastal Barrier Resources Act restricting federal expenditures that might encourage development of coastal barriers along the Atlantic and Gulf coasts, and completion of two major National Science Foundation studies on flood hazard mitigation. The report included more explicit recommendations for the federal role in supporting state and local initiatives.



Coastal management in the United States is shaped by the federal Coastal Zone Management Act of 1972 and the Coastal Barrier Resources Act of 1982. The former authorized federal grants to states for development and implementation of coastal management programs for water and land resources in coastal zones. As amended, the Act incorporates both flood loss reduction and protection of natural resources into program goals. The latter legislation established a system of largely undeveloped coastal barriers along the Atlantic and Gulf coasts in which federally subsidized development is restricted.

Sand dunes, Santa Rosa Island, Florida

Two major pieces of legislation rounded out the change in federal policy. In 1969 the National Environmental Policy Act provided for consideration of environmental values in all federal and federally supported actions, making it possible to recognize the multiple values of floodplains. The National Flood Insurance Act of 1968 made federally subsidized flood insurance available to participating communities, contingent upon their implementing nonstructural flood loss reduction measures embodied in local floodplain management regulations.

1970s: The Environmental Decade

During the 1970s numerous state and federal environmental laws and programs and water resources initiatives began to decentralize water management and bring about a much broader perspective on floodplains. Numerous federal programs took shape for water quality management, pollution and erosion control, watershed management, and protection of groundwater, aquifers, inland and coastal wetlands, barrier islands, and specific habitats. Complementary legislation was passed by many states, requiring environmental quality review and impact assessments at state and local levels.

During this decade, changes were made in the National Flood Insurance Program, a proposal for a Unified National Program for Floodplain Management was issued and later updated; and executive orders on floodplain management and protection of wetlands were issued, making disaster relief contingent upon mitigation action and requiring the consideration of nonstructural measures in federal flood control projects.

State and local involvement in floodplain management increased with the appointment of National Flood Insurance Program coordinators in all states, the adoption by more states of regulatory programs, increases in state budgets for floodplain management, and the adoption of resource conservation legislation. About 17,000 communities adopted floodplain management regulations, and many adopted regulations to manage other local resources, such as wetlands and coastal areas.

1980s: Continuing Evolution

More attention was given to implementing policies and programs for managing floodplains during the 1980s. The federal government took the role of coordinator and provider of technical assistance, while state and local governments gradually fashioned floodplain management strategies appropriate to their own jurisdictions. Interagency agreements were crafted to establish common policy on nonstructural measures and to evaluate floodplain management options after disasters. The Coastal Barrier Resources Act of 1982 established a policy of nondevelopment and avoidance of high hazard areas by prohibiting new federal expenditures on certain undeveloped coastal barriers.

The natural and cultural resources of floodplains received more protection through multipurpose, often federally supported projects for open space, recreation, urban renewal, greenbelt, and waterfront redevelopment.

State and local officials became even more involved in hazard mitigation planning with the implementation of requirements for planning after all Presidentially declared disasters and with participation in interagency hazard mitigation teams.

The Management Framework

Like any activity, floodplain management is carried out within a structure of legislative, administrative, economic, and judicial opportunities and constraints. The way in which floodplain lands and waters are handled, decisions are made and actions taken—whether by the U.S. Congress or by a single homeowner in a floodprone area—depends upon the relevant law, the policies and programs of government agencies, funding, public interest and opinion, and the availability of needed information. The framework for floodplain management has been strengthened significantly since the 1960s. Before then, flood loss reduction was largely dependent upon flood control works and federal actions; at the same time, a number of single-purpose federal laws and programs protected various natural resources, only indirectly addressing pro-