FLOOD INSURANCE AND ITS RELATIONSHIP TO FLOODPLAIN MANAGEMENT

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Evolution of the Management Program

The National Flood Insurance Program has had the greatest impact of any federal program in developing an awareness of the need to manage our nation's floodplains. It involves all three levels of government--local, state, and federal--and has, therefore, engendered many conflicts over regulations, standards, and policies. The national impact took many years to evolve and its effectiveness has been hampered by some of the policy decisions in the political arena.

Flood insurance first became a national topic in 1951 following a disastrous flood along the Missouri River. President Truman asked the insurance industry to re-examine its traditional position of not underwriting flood damages. In response, the Insurance Executives Association appointed a committee to study the problems of floods and flood damage. In May of 1952 a report was published with the conclusion that insurance companies:

> could not prudently engage in this field of underwriting. It is our considered opinion that insurance against the peril of flood applicable to fixed property cannot successfully be written and that any specific promise of indemnity for loss by flood must therefore be regarded as in the nature of a subsidy or relief payment, which are quite outside the scope of private insurance.... As a long-range program, it appears that an accelerated flood control program supplemented by such relief payments as are necessary on account of flood damage would be more in the interest of the public than a program of so-called 'flood insurance' which would not be self-supporting.

In August of 1955, rainfall associated with Hurricanes Connie and Diane created catastrophic losses in the northeastern United States. These disasters, coupled with a December, 1955, storm along the California coast, resulted in strong political pressure on the Congress for disaster assistance. Once again the insurance industry was asked to re-examine its position on flood damages and it quickly responded with the same conclusion as in 1952.

The Congress then proceeded to enact its own program called the Federal Flood Insurance Act of 1956. This legislation intended to provide reimbursement to individual homeowners who suffered flood losses up to a maximum of $10,000. Despite the fact that the legislation was enacted, funds were never provided because there were those in Congress who recognized that this was a "giveaway program"--without some control on construction in the floodplain, it would be encouraging more spiraling flood damages and further raids on the federal treasury.

In 1966, the President's Task Force on Federal Flood Control Policy recommended that the feasibility of insurance be studied with rates to be established to reflect annual potential damage, and an "occupancy charge" that would preclude new development unless the advantages were expected to equal or exceed the total social (public and private) cost. These concepts were incorporated in a pilot program which led to the creation of the National Flood Insurance Program in the Housing & Urban Development Act of 1968. This new program had a "double-barrel" approach--indemnification for those suffering damage was contingent on the local authority adopting criteria that would assist in reducing damage caused by floods and guide new construction away from flood hazard areas. It was hoped that this approach would eventually make the program self-supporting as the subsidized portion of the annual losses became a smaller and smaller percentage of the total insurance pool.

NFIP

For the first five years of its operation (1968-1973), as a purely voluntary program, the National Flood Insurance Program had little national impact. Relatively few flood-prone communities had adjusted building codes and construction practices to gain eligibility for federally subsidized flood insurance. In spite of the low subsidized rates, few owners purchased flood insurance when their communities became eligible for coverage during the period between 1968-73.

During this period, Congress made some changes which to this day are being

debated as having a negative impact from a flood plain management perspective. These were done in the 1969 amendments to the program as follows:

1) The word flood in the legislation was to include the phenomena called "mudslides." This action was the result of severe storms in California which, combined with unstable soil conditions, resulted in earth movement down a slope, often carrying with it existing structures or covering them with a "sea of mud." To my knowledge, federal land use criteria for these conditions have never been promulgated, but some counties have made a major effort in trying to control the problem. This issue, along with alluvial fans and high-velocity shallow flooding, will be noted further in this presentation.

2) The second debatable change in the law was making available flood insurance for existing structures in an area that had not been studied for actual flood risk, provided that the community promised to adopt the necessary criteria when the study was completed. New structures could not obtain insurance until the final study, but were permitted to locate in the floodplain in ignorance of the true risk. This change, which later was called the Emergency Program, did expand the availability of insurance, but may have induced many unwise decisions for new construction. A positive change took place in December 1971 when the Federal Insurance Administration modified its regulations to require the 100-year flood be used as a minimum standard for the necessary Land Use Criteria. Prior to that time, it was suggested as a guide but not required. Along with that change, a limitation of a one-foot rise was established for the maximum impact of any future floodway criteria. The evolution of this criterion and the 100-year flood standard will be discussed further.

The chain of flood disasters in 1972 and 1973 under the voluntary program--Rapid City, South Dakota; Hurricane Agnes-caused flooding in Pennsylvania, Virginia, and New York; Buffalo Creek, West Virginia; and Mississippi River floods found thousands of uninsured flood victims, and federal outlays for these and other disasters were in the neighborhood of $5 billion. Confronted with the enormous loss of life in these disasters as well as spiraling federal costs for national recovery efforts, Congress passed the Flood Disaster Protection Act of 1973 (Public Law 93-234). This law put "teeth" into the Flood Insurance Program by requiring flood insurance as a condition for any federal or federally connected financial assistance in flood-prone areas. Significantly, the 1973 act also prohibited loans from conventional or public

sources for existing or proposed construction in identified flood-prone areas of communities that fail to adopt minimum floodplain management standards by certain deadlines.

The significance of this positive change in the direction of the program emerges in sharp relief when we consider that in January of 1970, only four communities were in the program; seven years later (1977) there were over 15,600 flood-prone communities that had adopted minimum floodplain management standards to gain eligibility for flood insurance and the long-sought federal financial assistance. At that time, about 97% of the structures in the nation's floodplains were eligible for coverage under the program.

At issue with the 1973 Act was the problem of administering the program with increased numbers, and the fact that the mandatory requirements brought many legal challenges and a demand for more specificity in the land use criteria, hydraulic and hydrologic procedures, and field surveys for mapping. In response to these problems, the Federal Insurance Administration proceeded to standardize its processes and revamp its regulations. These proposed changes were published in The Federal Register on January 21, March 26, and June 3, 1975. After all comments had been reviewed and evaluated, the final regulations were published on October 20, 1976.

E. O. 11988

The impact of the revised regulations were further enhanced in February of 1978 when the U. S. Water Resources Council published guidelines to federal agencies for the implementation of Executive Order 11988--Flood Plain Management Guidelines. The Guidelines required that all federal agencies use the floodplain standards established by the Federal Insurance Administration in preparing their procedures for compliance.

The new E. O. directed federal agencies to avoid floodplains unless it was the only practicable alternative. If it could not be avoided, the objectives of the National Flood Insurance Program would be used. For the first time, a set of standards was adopted for universal use by the federal agencies. This was a major breakthrough in "bureaucratic red tape" and gave the Federal Insurance Administration the national recognition it deserved.

Technical Issues

As stated previously, the National Flood Insurance Program affected all levels of government, often causing conflicts of standards and policies for regulation. The following is a brief history of the evolution of the more

critical technical standards that had to be accepted at all levels of government.

100-Year Flood

When the Congress created the NFIP, it mandated that flood hazard areas would be identified, but did not establish the definition of a "flood." Therefore, the Federal Insurance Administration, with the assistance of the University of Chicago, invited experts in the field to a national symposium in December of 1968. As chairman of the New England River Basins Commission Task Force on Flood Plain Management, I was invited to participate and was assigned to a committee to recommend hydrologic standards for the identification of flood-prone areas and their eventual regulation. Prior to the symposium, the federal agencies such as the Corps of Engineers, TVA, U.S. Geological Survey, SCS, and Weather Service had been using varying standards based on their individual assigned missions. Those standards varied from a 50-year flood (USGS) to a 10,000-year flood (TVA).

After extensive deliberation, the committee recommended that the 100-year flood would be a reasonable level to use in identifying flood-prone areas. It was considered to be large enough to identify a serious problem area which is normally beyond the imagination of most of the local people, but was not catastrophic and could readily be exceeded. There was insufficient time for an economic analysis, but the recommended level was a compromise that the committee members could support. It was a compromise between extreme values of flooding, but most important it was a compromise between an individual's right to develop his or her property and the public interest which must monitor the disaster assistance costs associated with those decisions.

The 100-year flood standard was accepted by the U.S. Senate Committee on Banking, Housing and Urban Affairs following hearings in 1973, and amended to the National Flood Insurance Act in 1974. The mandatory requirement of participation in the NFIP as a condition of federal financial assistance in identified flood hazard areas brought about many legal and technical challenges to the adopted standard. It has continued to have general acceptance and has proven economically prudent in most cases.

The economics of elevation versus the potential for damages or the high cost of insurance was demonstrated in the FIA publication, Elevated Residential Structures (1976). This conclusion was reinforced by the Corps of Engineers Hydrologic Engineering Center in its publication of 1978 entitled, Physical and

Economic Feasibility of Nonstructural Flood Plain Management Measures. The examples shown demonstrate that costs are exceeded by benefits for all locations, all flood hazard factors and all types of structures. Additional publications by FIA and FEMA--Floodproofing of Small Commercial Buildings (1979), Coastal Construction Manual (1981), and Elevating to Wave Crest Level (1981)--all provide expanded methods for determining the magnitude of costs and benefits which justify elevating to the 100-year level.

Floodways

The issues of floodway determination, selection, regulation, and management are complex and therefore the least understood at the local levels of government. These issues become much more critical when a community realizes that development can actually be denied if the proposed location falls with a "designated floodway." Thus the potential for litigation.

The **floodway** is a device to insure that once a 100-year flood elevation has been established for a riverine situation, subsequent development should not cause an increase in that level in a recurrence of the 100-year storm analyzed. It is effective by reserving a portion of a floodplain closest to the channel for general open space use. It assumes that the remainder of the floodplain can become fully developed and full encroachment on the valley cross-section will not result in an increase of more than one foot in elevation for a recurrence of the design storm. The one-foot rule is intended to be a maximum allowance in a compromise to permit development.

In terms of legal liability, it should be a "zero rise" so new development cannot encroach and make the problem worse. However, recognizing the state of the art of hydraulic computations, the one-foot allowance is reasonable assuming complete development in the entire cross-section of the floodway fringe areas, which is an extreme supposition. Studies by the Corps of Engineers have indicated that, **on the average**, full development of the flood fringe areas has resulted in 0.5 foot increase in water surface elevation. This lower elevation is due to the fact that floodway fringe development often includes street areas and open spaces between buildings that act as supplemental floodways parallel to the direction of the flow. It is recognized that in many small urban floodplains, **any** downstream modification which creates a backwater problem could be subject to litigation.

The FIA regulations do not address this issue except to say that a maximum of one foot is allowable. However, the selection of a floodway is not a FIA

decision, but a local planning decision constrained by FIA requirements. In the planning process, the impact of new development on existing properties must be a major consideration. The economic health of a community and the manner and direction of projected growth are all part of the normal planning process exclusive of flood-prone areas. Therefore, the floodway issue is an additional but very vital consideration. In an effort to minimize the possibility of future litigation due to adverse impact of development, many states have established standards more restrictive than FIA. These lower allowances which FIA has supported range from 0.2 to 0.5 feet.

The typical engineering analysis includes a procedure whereby both sides of a stream must be treated equally to avoid the charges of bias or discrimination in the planning decisions on permitting future development. An engineering solution that has been supported legally is called an "equal conveyance" method. This method, used by FIA and its contractors, attempts to establish lines of equal hydraulic efficiency, which is a function of the physical characteristics of the embankments, thereby removing any political bias. This generally results in the final floodway being centrally located in the floodplain where the greatest depths of flooding and velocities are located. However, there are other options for planning purposes where a meandering stream does not have a well-defined channel, or perhaps pressure for growth is taking place on one side of the river only. These require many alternate studies and considerations and must withstand legal challenges before FIA will accept other options. A "density floodway" concept is currently being considered to control encroachment by establishing the degree of development without establishing limits on location. This may have limited application, but may be the only equitable solution to those desiring to occupy the floodplain. The engineering and legal issues imply that it is complex but feasible.

Coastal Flooding

Most floodplain discussions center on river or watershed problems, yet a significant amount of annual flood damage is due to coastal flooding, normally the effect of wind-driven water associated with hurricanes, tropical storms, and "northeasters" in the Atlantic and Gulf areas. On the Pacific coast, there are severe storms. Flooding in large lakes may be a parallel situation. In the above situations, elevating and floodproofing structures in ways similar to those used in riverine areas are still valid solutions, provided the velocity of moving water is considered as an additional factor. The designation "V

zone" is a reminder of that additional hazard. In these areas the 100-year anticipated water level is also required.

The original published maps by FIA included a still-water level which reflected all of the dynamic forces except for the wind-generated waves. However, the insurance rates assigned to these areas were increased with a surcharge to reflect the potential of wave damage above the design level in a recurrence of the 100-year storm. In 1980, FIA revised its policy and required that the wave height effect be incorporated into the mandatory design level for coastal structures. These issues are still being debated. Technically both are good guidelines, with the inclusion of the wave height requiring more specificity with location and proximity of other development. In either case, they are intended to reflect a cost of occupancy in the coastal flood plain. This cost of occupancy has not been a deterrent to development often considered unwise in unstable coastal areas. In fact, the NFIP has been accused of encouraging this development which accelerates the instability of the coastal land forms.

Coastal Barrier Islands

These unstable areas are most prevalent in coastal barrier islands, which consist of unconsolidated material and are subjected to significant wind and wave energies. There has been much public debate over the last several years about the negative impact of the NFIP on these coastal barriers. This public outcry resulted in the Omnibus Budget Reconciliation Act of 1981 including a provision amending the National Flood Insurance Act as follows:

> Section 1321(a) No new flood insurance coverage shall be provided under this title on or after October 1, 1983 for any new construction or substantial improvements of structures located on undeveloped coastal barriers which shall be designated by the Secretary of the Interior.

The impact of provisions of this legislation is difficult to project. It only addresses flood insurance and not the various federal programs which provide assistance to the development of the barriers infrastructure. Once the infrastructure is in place, the areas will develop even without flood insurance. Hopefully the communities will continue to enforce stringent building codes.

From the standpoint of the National Flood Insurance Program, the greatest significance of the Omnibus Budget Reconciliation Act of 1981 is that it is the

first instance where a decision has been made to deny insurance in a particular area. Denial of flood insurance is being used to deter and slow down development on undeveloped coastal barriers not simply due to the hazards but also to preserve fish and wildlife habitat and unique and valuable natural areas. This in itself represents a major change in direction and a conscious decision by Congress to use the NFIP to achieve goals beyond merely idemnifying property owners from flood losses and getting communities to adopt and enforce sound floodplain management regulation.

Shallow Flooding

There are other types of flood conditions unrelated to, or not readily associated with, channel flooding and flood profiles. These have been referred to collectively as "shallow flooding." These include flows over alluvial fans and over broad areas where channels or water courses are imperceptible, the direction of flow or overflow is often indeterminable, and/or variable reliable determinations of depth or extent of such flow by normal methods would be expensive and time-consuming. These have loosely and inconsistently been referred to as "sheet flow," "sheet flow flooding," and sheet flooding," with different meanings in various regions.

Flooding characteristics and depth vary between the types of shallow flooding. Architectural and building practices vary with region of the country. These differences, along with the possibility of sheet erosion or increased velocities around corners of buildings, had to be considered in developing the necessary standards for damage reduction. The objectives are well defined, but the translation of those objectives into descriptive language for the regulations has been the most difficult part of the management.

Mudslides and Erosion

These two phenomena are being constantly debated as to their appropriateness in the NFIP. These are generally storm-related but their correlation with a specific meteorological condition is difficult to establish. Hence the controversy.

They are both the result of slope failure where soils became unstable from saturation or wind-driven water. In the case of mudslides in California, they have resulted in cases where loss in vegetation, due to a recent forest fire, left the slopes vulnerable to the onslaught of winter rains. The soils become unstable and slide, often burying structures with mud or carrying foundations and buildings away to destruction. The development of actuarial rates becomes

very difficult. FIA has relied very heavily on local governments and their experiences in developing the necessary management tools.

The problem of erosion is measurable over a period of time and therefore can be predicted. The question that FIA raises is: should the federal government provide a short-term role until the states involved develop management procedures to minimize losses? There have been several attempts to repeal this portion of the Flood Insurance Act, but the Great Lakes area representatives have resisted the change.

Community Compliance

When the NFIP was a voluntary program (1969-1973), community compliance was easily achieved. Communities that saw the advantages of the program were quick to provide the necessary documents and give assurances of enforcement. A simple annual report was sufficient.

When the program changed direction and made insurance mandatory as a condition of federal assistance in flood-prone areas, the FIA took on a "policing" role to monitor communities and establish suspension procedures and rights of appeal. The increase in number of communities made individual investigations an impossibility. Annual reports were formalized to be used as legal documents with "spot checking" by personnel when abuses were reported or witnessed.

Much of the abuse reported early in the program was due to lack of understanding by the local enforcement officials. In many rural communities, the elected or assigned officials had not had previous experience in this type of endeavor.

As discussed with reference to some of the earlier issues, this can be a complex program in some areas, and monitoring is more a problem of education and technical assistance than a policing effort. FIA has published many documents to provide this help and has initiated extensive research to simplify the procedures and requirements. The issuance of variances is the source of major abuses by local officials. FIA has tried to establish policies on this procedure, but there are legal limitations. Currently, the states are being considered as sources of talent to provide the necessary overview of the communities.

Role of the States

When the National Flood Insurance Program was enacted in 1968, the states were bypassed as an authority and the Federal Insurance Administration was

authorized to operate directly with communities. This created many problems, since the required land use regulations FIA was seeking from the community had to be authorized by the state. However, it may have been the Congress' opinion that the states had failed to enforce their "police powers," and thereby created the raid on the federal treasury.

In January of 1971, a quick survey was made of state land use control activities that would benefit communities wishing to participate in the NFIP. It was found that the states' involvement fell into five categories:

1) State establishment and enforcement of floodways, channel lines, and encroachment lines (California, Connecticut, Maryland, New Jersey).
2) State establishment of Flood Plain Regulation Standards; mandatory compliance within one year of data availability or state will enforce (Minnesota, Nebraska, Wisconsin).
3) State establishment of Flood Plain Standards; local adoption voluntary, but must meet standards. (California, Iowa, Kansas, Michigan; North Carolina pending).
4) State programs providing for **assistance only**; enabling legislation permitting local land use controls (Hawaii and Texas).
5) Enabling legislation only (most states).

Following this survey, inquiries were sent to all states inviting them to establish a role for themselves in the administration of the NFIP and indicate what standards they would recommend. In the absence of concrete responses, FIA adopted the 100-year standard and the floodway requirements previously discussed. At a later date, FIA did agree to recognize those states whose standards exceeded those published for the NFIP.

The publication of the regulations in October of 1976 put the states on notice that they had to establish procedures for controlling the location and design of **state structures** or structures built with state assistance. This required states to be responsible for their **own actions** in floodplains and brought them into line with local requirements and federal actions. Most states accomplished this by an executive order from the governor which was followed by individual agencies promulgating their own regulations and procedures to meet the requirement.

Program Assessment

The objective of the NFIP is to find ways to decrease loss potential while providing for the economic feasibility of continued and desired growth. Over-

restriction can be an economic waste, but under-regulation results in an unnecessary social cost. Individual decisions are still permitted provided they do not impose costs on others. The NFIP has all the features to carry out the above objectives.

Unfortunately, some of the amendments to the program have benefited special interests, and hampered the program from achieving its full national benefit. It appears that some in the Congress do not fully comprehend what its potential could be. The failure to provide funding to accelerate studies or permit more community assistance reflects this attitude.

Also preventing the program from achieving a greater impact have been the administrative decisions to reorganize assignments and staff for the responsible department within FIA or FEMA. In all these changes, floodplain management was relegated to a lower priority. However, that trend appears to be reversing. There were times that conflicts between the FPM regulations and the Insurance Agents Manual created serious problems in the field. With the current reorganization, those conflicts should be resolved soon.

The present mechanism for requiring insurance on federally assisted mortgages has many weaknesses, including poor monitoring. Some procedure should be found to establish the true costs of a potential disaster **before** a structure is built. This must include some vehicle for financial relief at the time of the disaster. Insurance appears to be the best mechanism to provide funding for a future need.

It should be understood that once a decision is made on building in a floodplain, the potential cost goes with that structure forever until a structural change is made. The decision makers should not be permitted to disregard those costs which the present loopholes allow. This is especially critical where variances from the required standards have been granted. If the decision to build in the floodplain includes a false sense of risk or financial hardship, the system should provide a mechanism of prepayment for flood insurance over the "useful life" of the structure. This cost would be a construction cost, no different than a cost for insulation or floodproofing. The cost would be included in the building or sale price and would not be separated from the other monthly costs of financing. With these prepaid costs identified, the decision to build in a flood-prone area versus flood-free areas would be made with all the facts at hand. Without this type of procedure, any variance granted would be ignoring the eventual public cost.

The "prepaid insurance" concept would satisfy the requirement that development did not create a greater demand on the federal treasury. The only monitoring required under that concept would be development in a floodway. The threat of litigation by upstream property owners should be sufficient to discourage major abuses in a floodway.

PART THREE
NATIONAL AND STATE ISSUES