

benefits and drawbacks of the national flood insurance program

As amended by the 1973 Flood Disaster Protection Act, the National Flood Insurance Program (NFIP) offers communities across the country insurance protection against flood damages in return for the institution of land-use controls guiding development away from flood-hazard areas. The bargain seems fair on the surface, and many communities have subsequently enrolled, but growing doubts as to the program's efficiency and equitability now lead many to conclude that enrollment in NFIP is, in many instances, undesirable.

What are the actual consequences for development implied by NFIP? Is the insurance end of the program working at odds with the land-use control aspect? What does the act imply for a town whose business district lies wholly or partially within the 100-year floodplain? While it is too early to give definite answers to these questions, a careful examination of the flood insurance program points to a number of possible problems.

Preliminary indications are that the insurance aspects of the program may not have the desired effect of bringing flood plain development into conformity with the flood hazard. In fact, when insurance rates are subsidized, the effect may be to stimulate growth in flood hazard areas, since land owners are paying insurance premiums that are less than the likely flood losses in the long run, and at the same time are eliminating the risk of large, unexpected damages by paying a yearly premium. Secondly, the uniform national standard (100 year flood) on which the accompanying land use controls are based may not reflect the desired trade-off between benefits and costs of developing a flood plain in local situations. This article will consider the likely effects of both the insurance and land regula-

tion elements of the NFIP on flood plain land use. It will also look into the difficulties inherent in an act which seeks to combine both insurance and land-use controls into a single program.

background

The National Flood Insurance Act¹ was enacted by Congress in 1968. Before this time, insurance had not been a possible adjustment in flood hazard situations. Because of the high risk and size of flood losses, private companies believed the insurance premiums needed to back a venture in areas subject to flooding would be high. If so, few policies could be sold, and risks would not be sufficiently spread to merit investment. An early attempt at government aid was the Federal Flood Insurance Act of 1956,² but no workable program was developed and Congress refused to appropriate funds.

Interest in flood and other disaster insurance continued, however, especially after events such as the floods of 1962, the 1964 Alaska earthquake, and Hurricane Betsy in 1965. Following Betsy, the Southeastern Hurricane Disaster Relief Act³ directed a restudy of financial assistance programs for flood victims. The resulting report concluded that a flood insurance program was feasible, and could serve to discourage "unwise occupancy of flood prone areas", as well as help individuals bear the risks of flooding.

It was felt that if insurance premiums made explicit the costs of flood plain occupancy, it might discourage development that would be uneconomic in the long run. The advantages of flood plain sites (such as level topography, scenic resources, etc.) were acknowledged. But research had also shown that individuals often misperceive the flood hazard.⁴ The report proposed that "Flood insurance would be particularly valuable to those prospective occupants of flood hazard areas who make rational choices based upon weighing advantages and costs."⁵ Actuarial insurance rates, proportional to expected flood risks, would be developed based on average annual damage rates. (These are calculated from the relationships between frequency of flooding, depth, and damages.) Ideally, this type of insurance premium would be a means of informing prospective occupants about the costs of flooding, as well as ensuring that they bear them.

Congress recognized that intensified use of flood-prone areas led to increasing damage potential. Therefore, as a precondition to acceptance into the program and the sale of insurance, the 1968 Act required a community to "have adopted adequate land use control measures (with effective enforcement provisions)" consistent with Federal criteria. The aim was to guide development away from

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*Defined as the area which has a one percent chance of being inundated in any given year.

hazardous areas in order to reduce future flood damages.

The 1968 Act established a voluntary program administered by the Federal Insurance Administration (FIA) in the Department of Housing and Urban Development (HUD) with policies sold by private companies. Insurance was made available only in communities accepted into the program. However, its voluntary nature encouraged only a low rate of participation. In 1972, only 2% of the \$3.2 billion in

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damages caused by Tropical Storm Agnes was covered. A Government Accounting Office (GAO) report estimated that while a third of identified communities had joined, another 20% claimed they were unaware of the program's existence.⁶

Subsequently, the Flood Disaster Protection Act of 1973 was passed, amending the 1968 Act. It made participation, and therefore enactment of minimum land use control measures virtually mandatory for most communities by providing that no agency approve Federal financial assistance for construction or acquisition purposes (in designated flood hazard areas) unless the community is participating in the NFIP. These rules went into effect July 1, 1975, except for commercial loans on existing property, which must comply by January 1, 1976.⁷

Just under 2,000 communities were listed in the November, 1975 Federal Register as not participating in the National Flood Insurance Program. Ironically, a community which neither expects nor desires future development of its designated flood hazard areas might better control development there by abstaining from the program, since failure to enroll precludes federally-approved financing in the flood hazard areas.

However, because the expanded program is still fairly new, there is still little empirical information on the actual effect the present policy is having on flood plain development. FIA has been concentrating on identifying and enrolling communities in the program, and has been fairly successful, but monitoring has been neglected, thus, information on enforcement of adopted land use regulations and its impact is limited.

overview of nfip

There are two phases embodied in the National Flood Insurance Act, the “emergency” phase and the “regular” phase. Communities enter under the emergency phase, where subsidized insurance is available for all buildings in flood-prone areas.



Development in flood plains acts as a deterrent to commerce in many instances

Courtesy of Department of Natural and Economic Resources

Flood-prone areas are located with a Flood Hazard Boundary Map (FHBM), which indicates the approximate extent of the 100-year flood plain as perceived by a Washington-based hydrologist (using U.S.G.S. topographical maps).

After the community enters the program, FIA contracts with other agencies, such as the Army Corps of Engineers, to prepare more detailed, accurate flood hazard studies. These establish the elevation of the 100-year flood, and more importantly, the 100-year flood plain. At this point, three things happen. Communities have 6 months to enact additional land use control measures, which require elevation or floodproofing of structures in the hazard area to the level of the 100-year flood. Second, information is provided to establish a floodway, where development which increases flood levels is to be prohibited. Finally, the FIA establishes actuarial insurance premiums through publication of the Flood Insurance Rate Map (FIRM). From this point, new construction can no longer pay the subsidized rate.

flood insurance under the emergency program

In the emergency phase, only half of the program's total coverage limit is available (the first “layer”) and rates are highly subsidized to encourage participation. Limits and rates per \$100 are:⁸

Use	Total Coverage	Subsidized Rates (for half of total coverage)
Single family residential	\$ 70,000	.25
Other residential	200,000	.25
Nonresidential	200,000	.40
Contents, residential	20,000	.35
Contents, nonresidential	200,000	.75

Under the 1968 Act, no insurance was available for new construction undertaken during the emergency phase and actuarial rates went into effect as soon as an area was identified by FIA as having special flood hazards. If the structure was later sold, insurance, if available, would have to be purchased at the actuarial rates. The 1973 Act changed this original policy so that actuarial rates apply only to structures built after publication of the FIRM.⁹ Until then, new construction is treated no differently from pre-existing structures, which means that insurance rates are subsidized.

flood insurance under the regular program

When the regular phase begins, the total limits of coverage (the first and second "layers") become available. For buildings beginning construction before the effective date of the FIRM, the first layer of coverage is available at the lower of the subsidized or actuarial rates. Actuarial rates only apply to the second layer of coverage, with a maximum rate of .50 per 100 for one-to-four unit residences. For new structures, actuarial premiums apply for all insurance coverage.

effect of insurance on land development

The amount of subsidy for any unit depends, of course, on what the true actuarial rates would be. For low hazard areas, the actuarial rates are less than the high hazard areas. Average annual damage figures suggest that most occupants of the 100-year flood plain will find it to their advantage to purchase subsidized insurance, and most of those outside the area will not. However, a sample of 48 cities noted that the average annual damages for zones of equal risk varied widely.

Because subsidized rates are not proportional to actual risk, however, they do not act as a refined mechanism for bringing development into patterns consistent with the flood hazard (as actuarial rates are supposed to do). Furthermore, individual responses will depend on personality, as well as the perceived costs of flooding. For example, if individuals wish to avoid floods entirely, the designation of flood hazard areas alone should be enough to discourage use of flood plain sites since locating outside the floodplain is the surest way to avoid flood damages and risks. On the other hand, existing

Federal policies with respect to income tax and disaster relief are such that any mandatory insurance premiums, subsidized or not, may represent an increase in the cost perceived by individuals. As such, subsidized premiums, even in high risk areas, may discourage some development of flood plain sites.

This is not to say that subsidized insurance will lead to optimal or even desirable floodplain use. For some people, it is likely that subsidized insurance will reduce the risks and costs of flood plain occupancy when flood insurance is purchased. Risks, defined as the variability of year to year losses, are virtually eliminated up to the limits of coverage for the site occupant and shifted, instead, to the underwriter of the policy. Actual damages (costs) of flooding are not reduced by insurance. But the individual reduces his own costs if the premiums he pays add up to less than the expected flood damages—an occurrence that is especially likely with subsidized premiums. Therefore, in some instances the availability of flood insurance (particularly subsidized insurance) *increases* the desirability of flood-prone land, by negating the risks. This could lead to increased damage potential.

Some might argue this increase in damage potential may be justified by the advantages of flood plain sites—(low land costs, scenic and recreational amenities, or proximity to services and other complementary land uses). But since subsidized premiums are entirely independent of the actual expected flood damages at a site, they give individuals no true indication as to the damage potential (cost) which should be weighed against such advantages.



Much commercial development has already occurred in flood prone areas

Courtesy of Department of Natural and Economic Resources



Flooding along Crabtree Creek in Raleigh, North Carolina

Courtesy of Department of Natural and Economic Resources

flood plain management regulations

Land use control measures (or "flood plain management regulations") are required as soon as a community is accepted into the National Flood Insurance Program and are strengthened as more detailed flood hazard information is provided by the FIA. The Federal legislation requires minimum standards, but local governments may adopt more restrictive regulations.

Specific land use criteria are promulgated by FIA as four partially overlapping sets of criteria for riverine flood hazards areas (there are additional criteria for coastal hazard areas). The first two measures, which must be enacted before a community is accepted into the emergency program, require a building permit program and an indication that flood hazards will be considered during review of development proposals. (Design and construction requirements include anchoring and other actions to "protect", "minimize", "reduce exposure", etc.)

Given such general terms and the limited hazard information available in the emergency phase, it is doubtful that unwilling communities will impose extremely restrictive standards. To do so could result in legal challenges on the grounds of denial of due process—that is, a lack of reasonable and substantial connection between the restrictions and promotion of public health, safety, and welfare. The

U.S. Water Resources Council found that "no court has suggested the detail or accuracy of flood data needed for sound regulation to meet due process and equal protection requirements."¹⁰ The possibility that strict regulatory measures will be adopted by communities, but not enforced, is made more likely by the admitted lack of enforcement supervision on the part of FIA. At this point, the only systematic follow up to the establishment of flood plain regulations is a required annual report to FIA.

The third set of criteria is to be enacted within six months of the date of FIA's final determination of flood elevations. At this point, data has been compiled on which to base specific elevation and floodproofing requirements. Residential structures are required to elevate the lowest floor above the

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level of the 100-year flood. Nonresidential structures, likewise, must be elevated or floodproofed to the level of the 100-year flood. Information on elevations and floodproofing certificates must be kept on file so actuarial premiums can be determined. Also, for any use it must be shown that the cumulative effect of the proposed use, when combined with all other existing and reasonably anticipated uses of a similar nature, will not increase the water surface elevation of the 100-year flood more than 1-foot at any point within the community.

These provisions, while increasing the cost of flood plain development, do not necessarily preclude it. The burden of showing less than a 1-foot increase in flood elevations may be an incentive to locate elsewhere. However, if the advantages of a flood plain location are great enough, both the costs of required measures, and of providing information regarding impact of flood heights (and possibly of building offsetting drainage or channel improvement works), may be outweighed. The required land use measures, in a sense, are analogous to actuarial insurance premiums in that they represent costs which must be borne by those who wish to occupy the flood plain.

The fourth set of criteria apply when information sufficient to designate the 100-year floodway is provided. A floodway is defined in terms of the area needed to convey the waters of a flood of a given magnitude (e.g. the 100-year flood) without raising water surface elevations more than a certain amount. FIA criterion list one-foot as the maximum allowable increase. Other jurisdictions have been more restrictive—Illinois, for example, has adopted a 0.1 foot standard. In order to designate a floodway,

information on floodplain and channel cross-sections, as well as flood elevations, is needed. It is generally assumed that areas outside the floodway will not convey flood waters and will thus be safe for development.

Once a floodway has been designated, no fill or encroachments are allowed within its boundaries which might impair the passage of the waters of a 100-year flood. An exception is made where the effect on flood waters is fully offset by stream improvements. Elevation and floodproofing requirements in the third set of criteria still apply to the remainder of the 100-year flood plain. Again, insurance premiums will not be the major costs to developers, since structures will have to be built to survive the 100-year flood with minimal damage. Rather, the major costs which must be weighed against benefits are those of reducing susceptibility to damage from floods up to the 100-year level. These costs are not indicators of the expected flood damages at a site, as would be actuarial insurance premiums based on frequency-damage relationships. The only properties which would be subject to high actuarial premiums are unprotected structures (those built before establishment of the 100-year flood elevation), for the second layer of coverage.

summary

Basically, then, NFIP is a single-purpose program aimed only at damage reduction. However, floodplains are often the site of natural resource values which are not recognized by the program's land use requirements. Fill and construction, for example, are allowed in the floodplain. Such activity



Courtesy of Department of Natural and Economic Resources

may limit flood storage capacity, destroy natural and scenic resource values, lead to increased depths and velocities which result in erosion and channel scour, as well as create a potential for catastrophic loss of life and property from floods larger than the 100-year standard. Technically, a community is free to enact more restrictive land development controls which might avoid some of these costs of flood plain development. Politically, however, the effect of minimum Federal standards may lead to an "If it's good enough for the Feds, it's good enough for us" attitude.

On the other hand, a community might wish to enact less restrictive controls, if the benefits of flood plain development outweigh the costs. All of the data and criteria provided by FIA are based on the flood with a one percent of occurring in any year (the 100-year flood). The Senate Committee Report accompanying the 1973 Act stated that "the standard is established in terms of probability in order to achieve uniformity throughout the country as an estimate of degree of risk, without regional discrimination."¹¹ This is for purposes of the insurance part of the program. However, both the locational advantages and the severity of flooding associated with each community's 100-year flood plain and elevation will differ. Thus, there is no guarantee this standard will result in an equitable burden among regions in terms of the foregone positive net benefits from socially-desirable flood plain uses which are not allowed.

"Even with the emphasis on land-use controls, no mandatory land-use planning requirements exist in NFIP"

In these instance, there are exception procedures in which "the Administrator recognizes that exceptional local conditions may render the adoption of a 100-year flood standard or other standards contained in this subpart premature or uneconomic for a particular community." When such an incident arises, a community may adopt ordinances less stringent than the minimum federal standards, which the Administrator accepts with only cursory review. Federal regulations concerning this kind of special land use control are undergoing revision, however, and the proposed regulations are more strict.

Even with the emphasis on land use controls, no mandatory land use *planning* requirements exist in NFIP. The regulations which contain the land use criteria (control measures or regulations) only contain "planning considerations" for flood-prone areas. Such considerations include the goals of flood plain management and factors which should be taken into account in formulating goals and regulations. Thus, the program emphasis is toward action in pursuit of damage reduction, rather than planning in pursuit of multiple goals.

In summary, the insurance aspects of the NFIP do not lead to "rational" development as foreseen in the 1966 report by HUD. Except for a short transition period between the emergency and regular phases, when actuarial rates apply but stringent land use measures are not yet enacted, insurance rates will not indicate the long-run economic costs of flood plain occupancy. The role of actuarial premiums will be to stimulate adjustments such as stream control or floodproofing which reduce damage to existing development, rather than to influence the location of new development. Most probably, the elevation and floodproofing measures (and their costs) and the limitations posed by floodway criteria will be the major development guidance aspects of the Program. It is entirely another question as to whether the land use control measures contained in this single-purpose program, and geared to a uniform (100-year) flood, are a rational basis for decisions regarding the use of flood-prone lands.

Footnotes

¹P.L. 90-448, Aug. 1, 1968, 82 Stat. 572

²P.L. 1016, 84th Congress, 70 Stat. 1078

³P.L. 89-339, Nov. 8, 1965,

⁴Kates, Robert W., *Hazard and Choice Perception in Flood Plain Management*. Dept. of Geography Research Paper #78 U. of Chicago Press, 1962. See also, Slovic, Paul et al., "Decision Processes, Rationality and Adjustments to Natural Hazards" in *Natural Hazards: Local, National and Global* ed. Gilbert F. White. N.Y.: Oxford Univ. Press, 1974. pp. 187-205.

⁵U.S. Senate, Committee on Banking and Currency, *Insurance and Other Programs for Financial Assistance to Flood Victims*. Committee Print, 89th Congress, 2d. August 1966. U.S.G.P.O., p. 48.

⁶U.S. General Accounting Office, *Actions Needed to Provide Greater Insurance Protection to Flood Prone Communities*, Report B-178737, July 19, 1973. U.S.G.P.O.

⁷P.O. 93-234, Dec. 31, 1973, 87 Stat. 975 s. 202

⁸P.L. 93-234, s101

⁹*Ibid.*, s 103

¹⁰U.S. Water Resources Council, *Regulation of Flood Hazard Areas to Reduce Flood Losses*, U.S.G.P.O., 1971. p. 30

¹¹U.S. Senate, Report 93-583, *op. cit.*, p. 5.