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GAO

Report to Congressional Requesters

March 1994

FLOOD INSURANCE

Financial Resources May Not Be Sufficient to Meet Future Expected Losses

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GAO

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Resources, Community, and
Economic Development Division

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The Honorable Donald W. Riegle, Jr.
Chairman, Committee on Banking, Housing,
and Urban Affairs
United States Senate

The Honorable Paul S. Sarbanes
Chairman, Subcommittee on Housing
and Urban Affairs
Committee on Banking, Housing,
and Urban Affairs
United States Senate

The Honorable John F. Kerry
United States Senate

This report responds to your request for information on the financial condition of the National Flood Insurance Program administered by the Federal Emergency Management Agency's (FEMA) Federal Insurance Administration. The program, along with low-interest loans provided by the Small Business Administration and individual and family grants provided by FEMA, is a major component of the federal government's efforts to provide flood-related disaster assistance. Floods during fiscal year 1993, including last summer's flood in the Midwest, have resulted in the payment of hundreds of millions of dollars in federal flood insurance claims that have drained the cash reserves of the program. Members of Congress and the public have raised concerns about whether the program has sufficient financial resources to meet its current and potential future obligations.

Prior to the inception of the flood insurance program in 1968, flood insurance was generally not available from private insurance companies. The National Flood Insurance Act of 1968 (P.L. 90-448) established the program to identify flood-prone areas, make flood insurance available to property owners living in communities that joined the program, encourage floodplain management efforts to mitigate flood hazards, and reduce federal expenditures on disaster assistance. Flood insurance rate maps (FIRM) were prepared to identify special flood hazard areas. In order for a community to join the program, any structures built within a special flood hazard area after the FIRM was completed were required to be built to the program's building standards that are aimed at minimizing flood losses.

Owners of these post-FIRM structures pay actuarial rates for national flood insurance.[1] By contrast, subsidized insurance rates are available for owners of older, generally less flood-worthy pre-FIRM structures.

This report provides information on the (1) actuarial soundness of the program, (2) potential financial impacts of increasing subsidized flood insurance rates and enhancing program participation, and (3) procedures used to set the program's insurance rates. In addition, as agreed with your offices, appendix I updates our review[2] of FEMA's actions on its financial management problems addressed in audits of the fund that were prepared by FEMA's Office of Inspector General.

Results in Brief

The flood insurance program is intentionally not actuarially sound because the Congress authorized subsidized insurance rates to be made available for policies covering certain structures. Because about 41 percent of policies were subsidized as of 1993, overall premium income, while sufficient to cover flood losses sustained in most recent years, is not sufficient to build reserves to meet future expected flood losses. The Insurance Administration's annual target for the program's overall premium income is the amount of loss in an average historical loss year, which is the approximate average annual loss experience under the program since 1978. Since no catastrophic loss years have occurred since 1978, collecting premiums that are based on an average historical loss year does not enable the fund to build sufficient reserves to cover a possible catastrophic loss year in the future. Thus, it is inevitable that claims losses and program expenses will exceed the program's funds in some years.

Increasing the premiums charged to subsidized policyholders (thereby decreasing the subsidy) to improve the program's financial health could have an adverse impact on other federal disaster-related relief costs. Increasing subsidized rates would be likely to cause some policyholders to cancel their flood insurance, and if flooded in the future, these people might apply for Small Business Administration loans or FEMA disaster assistance grants. On the other hand, efforts to build reserves by increasing participation in the flood insurance program would be likely to

[1]An actuarial rate is risk-based because it considers the financial risk to the insurer in issuing an insurance policy. For the entire program to be actuarially sound, the overall revenues from insurance premiums would need to be sufficient to cover expected claims losses and program expenses.

[2]We discussed both the actuarial soundness and financial management issues in our testimony before the Subcommittee on Housing and Urban Affairs, Senate Committee on Banking, Housing, and Urban Affairs. Flood Insurance: Information on Various Aspects of the National Flood Insurance Program (GAO/T-RCED-93-70, Sept. 14, 1993).

reduce the costs of other disaster assistance programs, but these efforts could also worsen the flood insurance program's financial condition by increasing the number of subsidized policyholders in the program.

The Insurance Administration sets rates for post-FIRM construction on the basis of actuarial principles that consider the actual flood risk of an insured structure, such as whether a structure is inside a special flood hazard area. The policies with these rates are not subsidized by the federal government. For structures covered by subsidized rates, which include flood-prone pre-FIRM structures, the Insurance Administration sets subsidized rates to generate sufficient premium income so that overall program premiums from both actuarial and subsidized policies approximate the amount of an average historical loss year. Despite subsidized premiums, the Insurance Administration expects the average premium for a subsidized policy to be about $401 in 1994 and the average premium for an actuarial policy to be about $247. The higher average premium for a subsidized policy reflects the significantly greater riskiness of flood-prone pre-FIRM properties.

Background

Over 18,000 communities have joined the flood insurance program. The FIRMs prepared for the Insurance Administration by the U.S. Army Corp of Engineers and private engineering companies for these communities identified special flood hazard areas, also known as the 100-year floodplains, which are areas subject to a 1-percent or greater chance of experiencing flooding in a given year. A key component of the program's building standards that must be followed by communities participating in the program is a requirement that the lowest floor of the structure be elevated to or above the base flood level—the elevation at which there is a 1-percent chance of flooding in a given year.

To encourage communities to join the program, thereby promoting floodplain management and widespread purchasing of flood insurance, the Congress authorized the Insurance Administration to make subsidized flood insurance rates available to owners of structures built before a community's FIRM was prepared. These pre-FIRM structures are generally more flood-prone than later-built structures because they were not built according to the program's building standards. However, owners of pre-FIRM properties that are sufficiently elevated can opt for actuarial rates.

From 1968 until the adoption of the Flood Disaster Protection Act of 1973, the purchase of flood insurance was voluntary. The 1973 act required the mandatory purchase of flood insurance to cover structures in special flood hazard areas of communities participating in the program if (1) any federal loans or grants were used to acquire or build the structures and (2) loans were secured by improved properties and the loans were made by lending institutions regulated by the federal government. Owners of properties with no mortgages or properties with mortgages held by unregulated lenders are not required to buy flood insurance, even if the properties are in special flood hazard areas.

For the program to be actuarially sound, its rate-setting process would have to include a consideration of the monetary risk exposure of the program, or the dollar value of expected flood losses over the long run. Since the magnitude of flood damage varies considerably from year to year, premium income in many years would exceed actual losses. This circumstance would enable the fund to build reserves toward a possible catastrophic year in the future.

Supplementing the program, the Small Business Administration offers low-interest loans to flood victims who are creditworthy. A flood victim who cannot obtain a Small Business Administration loan may apply for an individual and family FEMA grant of up to $11,900 or the amount of the loss, whichever is less.

The Program Is Not, Nor Was It Intended to Be, Actuarially Sound

The program is not actuarially sound by intention. The Congress authorized the Insurance Administration to subsidize a significant portion of the total policies in force, although it did not provide annual appropriations to cover the implicit subsidy.

The Congress also authorized the Insurance Administration to borrow up to $1 billion from the U.S. Treasury if necessary to pay claims losses. Also, since the inception of the program in 1968 through fiscal year 1986, the Congress appropriated about $2.1 billion (which represents about $3.3 billion in constant 1992 dollars) to the program; about half of the appropriation was to repay past loans from the U.S. Treasury, and the other half was to pay for administrative expenses. However, no appropriations have been made to the program since fiscal year 1986.

Subsidized Rates Restrict the Program's Income and Cover Structures That Incur Greater Flood Damage

The program is not actuarially sound because about 41 percent of the 2.7 million policies in force are subsidized. For a single-family pre-FIRM property, subsidized rates are available for the first $35,000 of coverage, although any insurance coverage above that amount must be purchased at actuarial rates. The Insurance Administration computed that total premiums paid by subsidized policyholders in fiscal year 1991 were about $780 million less than if these rates had been actuarially based and participation had remained the same. While the Insurance Administration only estimated the dollar value of the subsidy for this one year, the fund would currently have a significant reserve if rates had never been subsidized and participation in the program had not been affected by higher rates.

Pre-FIRM structures that are within an identified 100-year floodplain and are covered by subsidized policies are, on average, not as elevated as the post-FIRM structures in comparison with the base flood level. Insurance Administration officials told us that, on average, pre-FIRM structures not built to the program's standards are 4-1/2 times more likely to suffer a flood loss. When these structures suffer a loss, the damage sustained is, on average, about one-third greater than the damage to flooded post-FIRM structures. According to the Insurance Administration, when these two factors are combined, pre-FIRM structures suffer, on average, about 6 times more damage than post-FIRM structures.

Premium Income Not Sufficient to Build Reserves for Potential Catastrophic Losses

As an alternative to actuarial soundness, the Insurance Administration developed a financial goal for the program to collect sufficient revenues to at least meet the expected losses of the average historical loss year, as well as to cover all non-loss-related program expenses, such as program administration. However, the average historical loss year is based only on the experience under the program since 1978. Since that time, no catastrophic year has occurred,[3] and many years in the 1980s were characterized by fairly low loss levels. Therefore, the average historical loss year involves less claims losses than the expected per annum claims losses in future years, and collecting premiums to meet the average historical loss year does not reflect the collections necessary to build reserves for potential catastrophic years in the future.

The Insurance Administration determines the overall revenue requirements necessary to meet an average historical loss year through an

[3]Insurance Administration officials told us that a catastrophic year resulting in $3 billion to $4 billion in claims losses has a 1 in 1,000 chance of occurring.

analysis of a variety of reports about previous years' policies and claims. Since the numbers and types of policies can change from year to year, past experience is used to determine how such changes should be accounted for when determining future revenue needs. Additionally, the average historical loss year must be adjusted for inflation, since a given amount of actual damage to a structure in a previous year will have generated a smaller dollar claim than the same damage will generate in a current or future year. Finally, any changes in coverage offered under the program's policies would need to be considered when revenue needs are determined.

The level of the average historical loss year will change over time because of inflation, changes in the number and types of policies, and changes in loss levels. For example, while the average historical loss year was about $390 million in fiscal year 1993, it rose to about $450 million for 1994 because of a recent increase in the number of policies, the high loss experience in fiscal year 1993, and inflation.

Because rates for actuarial policies include a catastrophic risk provision, while subsidized rates do not, the contribution made toward the average historical loss year, as well as the "long-run expected loss year," differs considerably for actuarial and subsidized policies. For example, by design, premium income from actuarial policies in the 100-year floodplain equals 100 percent of those policies' expected claims losses over the long run, but the same premium income accounts for 124 percent of the expected claims losses of an average historical loss year. Conversely, premiums from subsidized policies account for only 33 percent of the premiums necessary to pay the expected long-run claims losses on these policies and 92 percent of an average historical loss year for those policies. The drain on the program comes from these policies. Proposed rate increases in fiscal year 1994 would raise subsidized contributions to 97 percent of the average historical loss year.

Severe Recent Flooding Resulted in the Insurance Administration's Exercising Its Borrowing Authority

Between fiscal year 1987 and the end of fiscal year 1993, the Insurance Administration's goal for the program of basing revenues on the amount of the average historical loss year, instead of on a long-run expected loss year (about twice as much), has allowed the fund to cover insurance claims as well as program and administrative costs without borrowing from the U.S. Treasury. However, the nation experienced severe flood damage in fiscal year 1993, primarily because of the December 1992 nor'easter, the March 1993 flooding in western Florida, and the July 1993 Midwest

flooding. Claims during fiscal year 1993 were about $984 million, which is more than double the average historical loss year.

At the end of fiscal year 1993, according to Insurance Administration officials, the fund had a positive cash balance, but the fund's obligations for outstanding claims were about $110 million more than the program's available resources.[4] In December 1993, the Insurance Administration borrowed $100 million from the U.S. Treasury. As of February 1994, about $12 million has been used to pay claims. Whether the Insurance Administration will have to further exercise its borrowing authority will depend on (1) the relative timing of payments on its current obligations and expected monthly premium receipts of about $55 million and (2) future insurance claims.

Increasing Premiums for Subsidized Policies or Expanding Participation in the Program May Have Adverse Financial Impacts

The government's expenditures on disaster assistance include both direct disaster payments through Small Business Administration loans and FEMA grants as well as the government's costs of subsidizing some flood insurance rates. The amount of direct disaster assistance is the result, in part, of the level of participation in the flood insurance program.

Therefore, efforts to build reserves to improve the financial health of the program by charging higher premiums for subsidized policyholders may not minimize the federal government's overall expenditures on flood-related disaster relief. On the other hand, expanding participation in the program is likely to reduce the cost of other federal efforts to provide flood relief, but greater participation by subsidized property owners could increase the program's unfunded liability.

Two bills introduced in the 103rd Congress—S. 1405 and H.R. 62—would revise the program by, among other things, expanding participation in the program by increasing compliance with the mandatory purchase requirement or extending the mandatory purchase requirement to mortgages not held by federally regulated lenders. Both bills would establish an interagency task force to conduct studies and make recommendations to revise the program. S. 1405 requires the task force to study the possibility of revising the rate structure to account for

[4]Insurance Administration officials noted that beginning in fiscal year 1986, the Congress required all program and administrative costs to be paid for by the fund without a commensurate rate increase. In 1991, the Congress authorized the Insurance Administration to charge policyholders a federal policy fee to pay for these costs. However, because costs were not collected between 1986 and 1991, program assets were reduced by about $355 million, according to Insurance Administration officials. These officials noted that the fund at the end of 1993 would have had a positive balance of $245 million had these costs been funded from commensurate premium increases.

catastrophic events and propose strategies to establish an actuarially based premium structure to account for all insurable risks.

Increasing Premiums on Subsidized Policies May Lead Some Policyholders to Cancel Their Policies

Increasing premiums on subsidized policies may not minimize the federal government's overall expenditures on flood-related disaster relief. Because they were built before the program's building standards became applicable, pre-FIRM structures are generally not as elevated as post-FIRM structures, and if their owners were to be charged true actuarial rates, these rates would be much higher than current subsidized rates.[5] For example, if the subsidy on pre-FIRM structures were eliminated, insurance rates on currently subsidized policies would need to rise, on average, approximately threefold, implying an annual average premium of about $1,100 for these structures. Significant rate increases for subsidized policies, including charging actuarial rates, would be likely to cause some pre-FIRM property owners—we do not know how many—to cancel their flood insurance. Although the information is dated, our analysis in the early 1980s indicated that if the program doubled the then-existing average premiums (both subsidized and actuarial), about 40 percent of the policyholders would be expected to cancel their policies.[6]

If owners of pre-FIRM structures, which suffer the greatest flood loss, canceled their insurance policies, the federal government would be likely to face increased costs, as the result of future floods, in the form of low-interest loans from the Small Business Administration or grants from FEMA. The effect on total federal disaster assistance costs of phasing out subsidized rates depends on the number of the program's current policyholders who would cancel their policies, which is unknown. Thus, it is difficult to estimate if the increased costs of other federal disaster relief programs would be less than or more than the cost of the program's current subsidy.

Expanding Participation Will Increase the Program's Potential Liability

Expanding participation in the program by increasing the rate of compliance with the mandatory purchase requirement or by extending the mandatory purchase requirement to property owners not now covered will be likely to increase the number of both subsidized and unsubsidized

[5]Also, Insurance Administration officials told us that making all rates actuarially based would not make the program actuarially sound. They noted that an initial capitalization would be necessary to establish some reserves in the event that a catastrophic year were to occur before sufficient reserves were accumulated from premium income.

[6]National Flood Insurance Program: Major Changes Needed If It Is to Operate Without a Federal Subsidy (GAO/RCED-83-53, Jan. 3, 1983).

policies. Although greater participation in the program is likely to reduce the cost of FEMA grants and Small Business Administration loans, the resultant increase in subsidized policyholders will put greater financial stress on the flood insurance program because the premiums received from subsidized policyholders are not sufficient to meet the future estimated losses on these policies.

The Program's Rate-Setting Procedures

Insurance rate-setting for national flood insurance differs, depending on whether a structure is covered by actuarial or by subsidized insurance rates. Subsidized insurance rates are available for pre-FIRM structures. However, post-FIRM structures, and certain pre-FIRM structures that qualify, are assessed actuarial rates.

Flood insurance can cover a structure and/or its contents. The maximum limits differ, depending on the structure; for example, the limits for a single-family structure are $185,000 for the structure and $60,000 for its contents.

Actuarial Rates Are Based on Actual Risk Exposures

Rates for post-FIRM construction are actuarial and are not subsidized by the federal government. The Insurance Administration's method for establishing these rates for post-FIRM structures lying within the 100-year floodplain follows a hydrologic method that is based on studies performed by the U.S. Army Corps of Engineers and private engineering companies. These rates are based on available hydrologic data, flood insurance claims, and simulations, as well as on engineering and actuarial judgment.[7] According to the Insurance Administration, the basic data elements it needs to predict expected flood loss include (1) probability estimates of the frequency with which floods of different severity will occur and (2) estimates of structural property damage caused by different types of floods. The Insurance Administration accounts for several program expense items, such as agents' commissions and the program's administrative costs, in the actuarial rates. (See app. II for more details on the actuarial rate-setting process.)

Actuarial rates are based on actual risk exposures and generally vary according to several risk-related factors. The following are the most important of these factors:

[7]We have not independently reviewed the studies on which the Insurance Administration's data for actuarial rate-setting are based.

- The flood-risk zone. Owners of structures in zones subject to greater flooding risk pay higher rates than owners of structures in zones that have less severe flood risk.
- The elevation of the structure relative to the base flood level. Even within a given flood-risk zone, the higher a structure is elevated relative to the base flood level, the lower the rates charged, because buildings at a higher elevation face a lower risk of flooding.
- The amount of insurance purchased. Rates vary depending on how much insurance is being purchased. The Insurance Administration sets rates for the "first layer" (the first $45,000 of insurance purchased on a single-family dwelling) at a higher rate than for coverage above that amount. This feature of the program's rate structure reflects differential risks, since claims are more likely to be made against the first several thousand dollars of coverage than against much higher levels of coverage.

Subsidized Rates Are Set by Administrative and Legislative Procedures

Owners of buildings constructed before the completion of a community's FIRM or before January 1, 1975, whichever is later, can purchase subsidized insurance. In 1993, about 41 percent of the program's policies were subsidized, but this percentage will decline over time as newer properties join the program and are charged actuarial rates. Subsidized rates on pre-FIRM properties have never been set by an analysis of the underlying flood risk. Instead, they are set by an administrative and legislative process. Insurance Administration officials stated that the use of the average historical loss year as an overall financial goal for the program helps to provide a more objective standard for the setting of subsidized rates than was true in the past.

To encourage greater participation in the program, rates for subsidized policies were decreased during the 1970s. By contrast, in the 1980s subsidized rates were raised, and coverage became more limited as the Insurance Administration attempted to meet its financial goal of collecting revenues sufficient to at least meet an average historical loss year. Insurance Administration officials said that they would keep taking steps to make subsidized rates more reflective of their actual risk exposure by decreasing policy coverage and increasing policy deductibles.

For setting rates on subsidized policies, the Insurance Administration's current method is to first determine the revenue needed to cover non-loss-related costs, such as that for program administration, as well as to collect sufficient premiums to at least meet an average historical loss year, on the basis of the current policies in force and the current price

level. Next, the Insurance Administration determines the revenue it will receive from policies with actuarially based rates. The Insurance Administration then subtracts the expected revenue from actuarially based policies from the average historical loss year level to determine the minimum premium income needed from policies with subsidized rates. Finally, the Insurance Administration computes the subsidized rates on the basis of the minimum revenue needed and the expected number of subsidized policies. The proposed subsidized rates are published in the Federal Register for public comment and submitted for congressional approval as part of the Insurance Administration's budget and authorization proceeding.

For single-family pre-FIRM properties, subsidized rates are available only on the first $35,000 of insurance coverage; rates for any additional insurance coverage are actuarially based. Although subsidized, rates for the first $35,000 of coverage for single-family pre-FIRM properties are generally significantly higher than actuarial rates for the first $35,000 of coverage on single-family post-FIRM structures that were built in compliance with the program's building standards. For example, the actuarial rate on the first layer of coverage for a one-story single-family post-FIRM structure with no basement in an AE zone (an Insurance Administration-designated flood zone lying within the 100-year floodplain) that is built at the elevation of the base flood level is 33 cents per $100 of insured value. On the other hand, the subsidized rate on a similarly located pre-FIRM structure that does not meet the program's building standards is 55 cents per $100 of insured value. Subsidized rates are generally higher than actuarial rates because of the substantially greater flood risk posed by pre-FIRM properties when they are compared to well-situated post-FIRM properties.

Because of the lower rates for actuarially based policies, owners of pre-FIRM construction often apply for actuarial rates if they can qualify to do so. In order for a pre-FIRM structure lying within the 100-year floodplain to qualify for actuarial rates, the owner must obtain an elevation certificate that specifies that the lowest floor of the structure is at least at the base flood level. Approximately 29 percent of all of the program's policies are for pre-FIRM structures that have qualified for actuarial rates.

Conclusions

The program is not actuarially sound because it does not collect sufficient premium income to build reserves to meet future expected flood losses. This situation occurs because premiums for 41 percent of the program's policies are subsidized. Therefore, it is inevitable that claims losses and

program expenses will exceed the funds available to the program in some years, and if a catastrophic loss year were to occur, not even the Insurance Administration's borrowing authority would be sufficient to cover claims losses.

Efforts have been made recently, such as S. 1405 and H.R. 62, to study revising the program by increasing the premiums paid by subsidized policyholders and expanding program participation. Increasing the premiums paid by subsidized policyholders to the actuarial level, or to some level between the current rate and the actuarial rate, may improve the program's financial health. However, higher premiums would also be likely to increase the costs of other disaster-related relief programs, because some policyholders would cancel their insurance but would receive other disaster assistance grants or loans, in the event of a flood. On the other hand, increased participation in the program by subsidized and unsubsidized property owners is likely to reduce the cost of other federal disaster assistance programs, but greater participation would also put greater financial stress on the program, to the extent that additional subsidized properties are covered under the program.

Matters for Congressional Consideration

Any attempt by the Congress to revise the flood insurance program in ways that will affect program participation, such as by expanding or strengthening the mandatory purchase requirement, should be considered in the context of the integral relationship between this program and other disaster assistance programs. Similarly, a revision of the subsidized premium rate structure that would eliminate all or part of the present subsidy should be analyzed in the context of the potential financial impact on other federal disaster assistance programs through, for example, the possible cancellation of policies by policyholders.

Agency Comments

We discussed the facts of this report with the Federal Insurance Administration's Deputy Administrator, the Executive Assistant to the Federal Insurance Administrator, and FEMA's Acting Deputy Chief Financial Officer. They generally agreed with our facts as presented on the actuarial soundness of the program, the potential financial impacts of either increasing subsidized flood insurance rates or expanding program participation, and the program's rate-setting procedures. They also agreed with our matters for congressional consideration. We incorporated, where appropriate, changes suggested by the officials to clarify certain

information presented. As requested, we did not obtain written agency comments on a draft of this report.

Scope and Methodology

We reviewed the actuarial soundness of the program and rate-setting procedures for both actuarial and subsidized policies. To complete this work, we reviewed the Insurance Administration's documents and interviewed relevant officials, including the Deputy Administrator of the Federal Insurance Administration and an Executive Assistant to the Administrator. In addition, we reviewed literature on actuarial rate-setting and spoke with two officials—one from a state insurance agency and one from a private insurance organization—familiar with the flood insurance program.

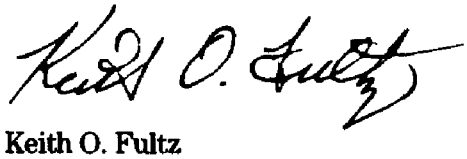
To identify the potential financial impacts of increasing subsidized rates and expanding program participation, we held discussions with Insurance Administration officials, analyzed data obtained from our review work mentioned above, and analyzed proposed legislation.

In reviewing the financial management of the program, we relied on the FEMA Inspector General's recently completed reviews of the program's financial statements. We talked to members of the Inspector General's staff and examined their workpapers. We also interviewed FEMA's Chief Financial Officer and flood insurance program staff responsible for the financial management of the program.

We conducted our review from January through September 1993 and updated certain information through February 1994.

Unless you announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will send copies to interested congressional committees; the Director, FEMA; the Director, Office of Management and Budget; and other interested parties. We will make copies available to others upon request.

This work was performed under the direction of Judy A. England-Joseph, Director of Housing and Community Development Issues. If you or your staff have any questions, she can be reached at (202) 512-7632. Major contributors to this report are listed in appendix III.



Keith O. Fultz
Assistant Comptroller General

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Abbreviations

BFE	base flood elevation
BFEWH	base flood elevation with wave height
DED	deductible offset
DELV	damage by elevation
EXLOSS	expense item factor
FEMA	Federal Emergency Management Agency
FIA	Federal Insurance Administration
FIRM	flood insurance rate map
GAO	General Accounting Office
LADJ	loss adjustment factor
OIG	Office of Inspection General
OMB	Office of Management and Budget
PELV	probability of elevation
SFHA	special flood hazard area
UINS	underinsurance factor

Actions Taken by FEMA on the National Flood Insurance Program's Financial Management Problems

Since 1979, FEMA has acknowledged problems with its financial operations. In 1989, the Office of Management and Budget (OMB) designated FEMA's financial management system and internal controls program as high-risk areas. In January 1993, OMB voiced reservations about the adequacy of FEMA's progress and future corrective action plans. Some of FEMA's financial management problems affect the flood insurance program.

FEMA's Office of Inspector General (OIG) audited FEMA's financial statements for fiscal years 1991 and 1992 in accordance with the Chief Financial Officer's Act. The audits identified problems in the program's financial management system and internal control structure that prevented accumulation and reporting of reliable financial information. That information includes the fund's balance on deposit in the U.S. Treasury and its other assets and costs of operation.

On September 14, 1993, we testified on these issues before the Subcommittee on Housing and Urban Affairs, Senate Committee on Banking, Housing, and Urban Affairs. Subsequent to our testimony, FEMA took action, or agreed to take action, to correct the problems identified in the OIG audits.

FEMA's Records Did Not Effectively Track or Monitor the Program's Fund Balance

OIG's Audit Results

As a result of a review of the program's financial statements as of September 30, 1991, FEMA's Inspector General concluded that FEMA does not have systems or records to effectively track or monitor the program's fund balance with the U.S. Treasury. He also reported that the program's cash balance with the U.S. Treasury is commingled with all other FEMA funds. Furthermore, for many years FEMA has not consistently reconciled its records with reported U.S. Treasury funds. Therefore, FEMA's Inspector General reported that it could not verify the fund balance with the U.S. Treasury. The Inspector General recommended that FEMA begin reconciling the fund's cash balance on deposit at the U.S. Treasury each month.

Although FEMA reconciled the balance for only some months during fiscal year 1992, the Inspector General was able to validate the program's receipts and disbursements for fiscal year 1992. Subsequently, after reviewing the program's statements as of September 30, 1992, the Inspector General again reported that it could not verify the reported ending fund balance because the beginning balance could not be verified and no separate account existed at the U.S. Treasury for the fund. The Inspector General recommended that FEMA establish a separate account in the U.S. Treasury for the flood insurance fund.

FEMA's Response

FEMA officials acknowledged the inaccuracies with the fund balance and stated that they were working at resolving the problems and anticipate performing reconciliations needed to validate the account balance. They stated that the potential misstatements concerning the fund's balance were not significant enough to affect the day-to-day decisions they make to ensure that sufficient resources are available to continue program operations and to make payments on claims.

GAO's Testimony

We concluded in our testimony that FEMA's determination of when, and if, the flood insurance fund needs to borrow from the U.S. Treasury may not be based on adequate data that FEMA maintains on the amount of program funds it has on deposit in the U.S. Treasury. Because FEMA may have to exercise its borrowing authority to pay claims, we stated that FEMA should implement the OIG's recommendation to establish a separate flood insurance program balance in the U.S. Treasury.

Action Taken by FEMA

Subsequent to our testimony, in October 1993 FEMA received notification from the Financial Management Service of the Department of the Treasury that confirms the establishment of a separate fund balance at the U.S. Treasury for the flood insurance fund.

FEMA's Financial Reporting Is Unreliable

OIG's Audit Results

FEMA's Inspector General was unable to express an opinion on the program's financial statements for fiscal years 1991 and 1992 because it found that (1) property and equipment accountability was inadequate, (2) inventories of its flood maps were not accounted for, and (3) administrative expenses were not accurately reported.

In the area of property and equipment accountability, FEMA's Inspector General reported that FEMA's policy is to expense property and equipment, such as digital and engineering equipment, as acquired. FEMA has no system to monitor or track its property, including its property and equipment held by contractors.

A contractor maintains FEMA's inventory of flood maps in a warehouse and purportedly has a perpetual inventory system to account for the quantities. However, FEMA did not report any flood insurance program inventory in its fiscal year 1991 financial statements, and in fiscal year 1992 it reported an inventory amount based on estimated quantities and unit costs rather than on a physical inventory. The costs of the maps, estimated to be 15 cents per map, are not documented, and as a result, the Inspector General could not validate the reported inventory of $6 million.

FEMA policy requires administrative expenses to be reported on an accrual basis that ensures that revenues and expenses are matched to the period in which the revenue is earned or the costs are incurred. However, the Inspector General found that some expenses incurred in administering the program are reported on an obligation basis. As a result of the inconsistent reporting, FEMA's Inspector General concluded that the financial reports do not provide an accurate, reliable perspective on the costs incurred nor the results of operations for the fiscal year.

The Inspector General made various recommendations, including short-term actions to correct these problems. For example, FEMA should conduct physical inventories of the program's assets and report administrative expenses on an accrual basis.

FEMA's Response

FEMA agreed to take some steps to improve its financial management problems, but it did not agree to implement either of the above recommendations. Instead, it said it would rely on the implementation of FEMA's Five-Year Financial Plan for fiscal years 1992-96 to provide long-term solutions to the program's financial management problems.

GAO's Testimony

We concluded in our testimony that FEMA should reexamine its decision not to make short-term improvements in the program's financial management system.

Actions Taken by FEMA

FEMA officials told us that, as discussed in our testimony, they have decided to make improvements in the program's financial management system. FEMA officials said they are in the process of awarding a new contract to maintain their inventory of flood maps. The new contract will require the contractor annually to make a physical inventory of the maps. FEMA officials told us that, other than the flood maps, they have very little equipment or property at contractors. The physical inventory required by the new contractor will correct the problems noted in the OIG report concerning property accountability, according to these officials. Also, FEMA officials told us that they are now reporting expenses on an accrual basis as recommended in the OIG report.

Actuarial Rate-Setting for Post-FIRM Structures

This appendix discusses the methodology used by the Federal Insurance Administration (FIA) for setting actuarial rates for structures that were built after flood insurance rate maps (FIRM) were prepared (referred to as post-FIRM construction). As discussed in the letter of this report, actuarial rates are charged on post-FIRM construction and on pre-FIRM construction that have been certified as meeting the National Flood Insurance Program's elevation standards. This appendix (1) describes actuarial rate-setting, (2) discusses key characteristics used to classify post-FIRM properties according to flood risk, (3) describes data elements necessary and the methodology used in the application of the hydrologic model for actuarial rate-setting, (4) discusses other components of actuarial rates, and (5) provides examples of post-FIRM actuarial rates for properties lying both inside and outside of the 100-year floodplain.

Actuarial Rates Are Based on Flood Risk

Insurance is a mechanism through which policyholders can pay a specific price in order to transfer a risk that they face to some other entity. For example, homeowners face the risk that their houses will burn down. By purchasing insurance at a predetermined price, a homeowner can effectively transfer, to an insurance company, most of the financial risk associated with losing a house to fire.

For a private-sector insurance firm to offer such risk transfer through the provision of insurance and remain profitable, it must set insurance rates high enough to cover expected claims losses, as well as non-loss-related expenses. To do this, a firm needs to set insurance rates in accordance with risk exposure or, in other words, the expected financial loss that the firm takes on by providing insurance on the current set of policies in force. Insurance rates that are set by taking into consideration estimated risk exposure are known as actuarial rates.

In the case of flood insurance, FIA uses a class-rating rather than an individual-rating system. That is, FIA classifies properties according to key characteristics of flood risk. All owners of properties in the same group are then charged the same rates. Even though individual risks may vary among properties within each risk group classification, these rates are actuarial in the sense that risk exposure for each classification of like properties is taken into consideration when setting the group's rates.

Key Characteristics Used to Classify Properties According to Flood Risk

In order to set actuarial rates for national flood insurance, information about the risk of flooding is essential. One of the primary objectives of the National Flood Insurance Act was to identify flood-prone areas. In doing so, flood insurance rate maps, which have been completed for nearly all communities that were considered to be flood-prone, provide information that is crucial for classifying properties according to flood risk. The key characteristics that are used to classify properties according to flood risk include the flood zone and the elevation of a structure relative to the base flood elevation (BFE). Information about both the zone and the BFE are obtained from FIRMs.

Flood Zones

Knowledge of the flooding risk zone is important for actuarial rate-setting because areas of differential flood risk should be charged different rates. Each FIRM outlines the flood zones throughout the community. The zones with a first letter of either A or V, are classified as "special flood-hazard areas" (SFHA). These areas are believed to face a 1-percent or greater chance of being flooded in a given year and are also known as the 100-year floodplain. V zones include coastal areas that incur wind velocities and associated wave heights that pose additional risks to properties during flooding events.[1] The other major zone is zone X, which includes areas outside the identified 100-year floodplain.

Base Flood Elevation

The maps, in most cases, also delineate the BFE for areas that lie within the identified 100-year floodplain. The BFE is the elevation relative to mean sea level at which there is a 1-percent chance of flood waters rising to 1 foot or more in a given year. The level of the BFE within a community can change throughout the floodplain, and those changes are delineated on FIRMs. The establishment of the BFE in V zones also takes into account the elevation of storm surges and the expected height of wave crests above storm surges. Thus, they are called BFEWH—"base flood elevation with wave height."

Knowledge of the BFE is important for a couple of reasons. First, the program's building standards require that the bottom level of structures be built at least to the elevation of the BFE to ensure that structures are not subject to a greater than 1-percent chance of flooding in a year. Second, in terms of classifying properties according to flood risk, knowledge of the BFE is important, because flood risks vary with the elevation of a structure relative to the BFE: The more elevated a structure is, the less likely flood

[1]The majority of policies under the flood insurance program are for structures in an A zone or the X zone. Relatively few structures are in the V zones, accounting for less than 2 percent of all post-FIRM properties.

waters will reach it. Thus, rates are set so that structures with the lowest floor elevated above the BFE are charged lower rates than those elevated only to the BFE or below the BFE.[2]

The Hydrologic Model[3]

The basic method for establishing actuarial rates on post-FIRM construction lying within the 100-year floodplain follows the hydrologic model described in a 1966 report by the Department of Housing and Urban Development entitled Insurance and Other Programs for Financial Assistance to Flood Victims.[4] The basic logic of the hydrologic model is to set flood insurance rates for a property according to its risk of being flooded. Thus, a major portion of flood insurance rates is based on the per annum expected dollar flood loss for a property of a given classification.

In the previous section, we noted that the key characteristics of the zone and the elevation of a structure relative to the BFE, which are available from FIRMs, are important for categorizing post-FIRM properties according to flood risk. Certain characteristics of the property, such as whether it has a basement, are also used for classifying properties according to risk. However, once a property is thus classified, all properties within the same group are charged the same flood insurance rates.

In the remainder of this section, we discuss the primary data sources necessary to apply the hydrologic model of rate-setting. These data provide information on the risk of flood for a given type of property within a given zone and of a particular relative elevation. We also discuss the hydrologic rate-setting model.

[2]Although post-FIRM properties are supposed to be elevated at least to the BFE, some properties may not meet this code. FIA provides rates for properties out of compliance on rate sheets as long as they are not more than 1 foot below the BFE. Rates for properties with the lowest floor elevated below the BFE are considerably higher. If a post-FIRM structure is more than 1 foot below the BFE, rates can be obtained by submitting to FIA directly.

[3] The method discussed in this section is used to determine actuarial rates for both the building structure as well as the insured's personal belongings, or the "contents" contained within the structure. Rates differ for these types of coverage, and buyers specifically purchase each type of coverage in order to be covered for both. Most of this discussion, however, focuses on coverage for the structure.

[4]Rates for post-FIRM properties in zone X, which are outside the 100-year floodplain, are set primarily through an analysis of previous years' claims.

Elevation-Frequency Relationship—"PELV" Values

A very important data element needed for the application of the hydrologic model is an estimate of the probabilities that floods of different severities, relative to the BFE, will occur in a given year. FIA calls these data probability of elevation (PELV) values. Within any zone, there is a 1-percent chance that flood waters will reach the BFE. However, across zones the likelihood that flood waters will reach 1-foot above or below that level will vary. For example, FIA notes that in zone A10 (currently part of zone AE), the probability of water rising to or above 1 foot below the BFE is 1.6 percent per year, and the probability of water reaching or exceeding 1 foot above the BFE is 0.6 percent per year.

PELV tables provide detailed information, by zone, about the frequency with which we can expect floods of all possible water surface elevations to occur. These data were generated on the basis of detailed engineering studies, available flood insurance data, simulations, and professional judgments and were established for each flood-hazard zone to meet generally accepted scientific parameters and legal considerations. One of the problems in establishing PELV tables, however, was that the flood histories on which these studies were based were generally not very long. Statistical literature has shown that when the history of these events is too short, the number of occurrences is generally, small which causes a bias toward establishing frequency probabilities that are too low. Consequently, the original PELV values were modified to account for this statistical bias.

Depth-Damage Relationship—"DELV" Values

A second necessary data element for the hydrologic model are estimates of the structural damage that will be suffered when a flood occurs. For a variety of depths of floods, and the associated depth of water in a structure, FIA has data, which it calls the depth-percent-damage relationship, or damage by elevation (DELV) values, that provide estimates of the percent of the value of a structure that is expected to be damaged. Information is presented by 1-foot increments of flood level within the structure and expressed as the average percentage of the property's value that will be damaged due to a flood of that elevation. For example, in 1987 DELV information, it was predicted that if water reached a depth of 2 feet within a one-story, no-basement structure located in the AE zone, 21 percent of the property's value would be damaged, and a depth of 4 feet of water within the same structure would cause a 29-percent value damage rate.

In A zones, it is assumed that damage will not begin to occur to a structure until water reaches the bottom of its lowest floor. However, depth damage tables for the VE zone include damage estimates before water actually reaches the lowest floor of the structure. In estimating expected damage to a structure in the V zones, it is assumed that damage—because of erosion, for example—begins to occur before water or wave action rises to the level of the structure.[5]

As with the PELV data, information used in establishing DELV values was obtained primarily from engineering studies. In 1973, data for DELVs were selected on the basis of studies done by the U.S. Army Corp of Engineers and available flood claims at that time. Currently, DELV values in the AE zone are updated on the basis of claims data available from flood insurance policies since 1978.[6]

Expected Damage Estimates

Knowledge of the elevation-frequency relationship and the depth-damage relationship allows a summing up of the range of flood probabilities and their associated damage to property and contents.[7] That is, each possible flood is multiplied by the expected damage should such a flood occur, and each of these multiplications is then added together. This summing up of each possible flood's damage provides an expected per annum percent of the value of property damage due to flooding. This expected damage can then be converted to an expected loss per $100 of property value covered by insurance. This per annum expected loss provides the fundamental component of rating-setting.

[5]These additional risks of damage below the lowest floor of a structure are included in rate-setting by adding expected damage due to 20-year events and successively more serious events, each measured by an additional foot of flood waters, up to the point that water actually reaches the structure. Those additional damage estimates are then factored into the DELVs used in the actuarial rate formula, which assumes the damage does not begin until water reaches the lowest floor of the structure.

[6]FIA determines whether it has sufficient data on floods of different severities since 1978 to actually replace the original DELV values. If data are sufficient, then there is "full credibility," and the original DELVs are replaced with DELVs based on experience under the program since 1978. If not enough claims data exist for full credibility, DELVs are based on a weighted average of the original base table values and the experience data since 1978, where the weight of the latter is the ratio of actual experience claims to the number of experience claims necessary for full credibility. This would mean that, over time, the original, theoretical DELV values will have less weight in determining actual DELV values used for rate-setting, although this will happen much faster in the case of shallow-depth floods for which data (that is, claims from flood losses) will accumulate much more rapidly to allow credibility analysis.

[7]The method of summation approximates calculating the area under a curve through integration. The estimation approximates the area defined by a function that expresses expected damage due to floods that occur with different probabilities.

Expressing this mathematically, where i is measured in increments of 1-foot or less, the fundamental concept of rate-setting is:

$$\sum_{m}^{M} (PELV_i * DELV_i)$$

Where:

$PELV_i$ is the probability, in a given year, of water surface reaching or exceeding elevation i, relative to the BFE.

$DELV_i$ is the percentage of property value damage to a structure due to a flood of elevation i.

m is the elevation at which flood waters reach the lowest floor of a structure.

M is the elevation at which the maximum amount of value damage to the structure is incurred—floods of a higher elevation are extremely rare.

The equation indicates that, for the set of structures of a given type, in a given zone, and of a given elevation relative to the BFE, expected damage through flooding is estimated by summing the damage that could occur to such a structure through a set of possible flooding events, beginning with a flood that brings waters high enough to reach the lowest floor of the structure, at elevation m.[8] Increments of 1 foot for successively worse (and less likely) flood possibilities are then added until the point at which the maximum probable amount of damage is incurred—elevation M; at that point, worse floods are extremely unlikely to occur. Since the damage that will occur with different types of flooding are multiplied (that is, weighted) by the probability of a flood of that type occurring, the summation equals a per annum expected damage (as a percent of value) due to all possible flooding events.

Each zone is characterized by different probabilities of floods occurring (that is, different PELVs), and some have different damage consequences when a flood of a given elevation does occur (that is, different DELVs). Therefore, the formula provides different expected damage estimates

[8]In the AE zone, the elevation of a structure is measured at the top of the finished flooring of the lowest floor, while in the VE zone, it is measured at the bottom of the floor beam below the lowest floor.

across zones. Additionally, within a zone, the estimation is repeated for all different elevations of structures, relative to the BFE. Thus, the formula will generate lower rates for structures elevated above the BFE than for structures elevated to the BFE because it will take a storm of a greater severity to bring flood waters to elevation "m" for the more elevated structure. Finally, within a zone and for a given elevation of structure relative to the BFE, the calculation is repeated for several categories of structures. For example, structures with basements generally pay more than those without them, and structures with more than one floor above basement level generally pay less than those with only one floor above the basement level.

The formula shown above will provide a rate per $100 of purchased insurance. The rate is then multiplied by how many hundreds of dollars of insurance coverage are being purchased to determine the premium for an individual policy. Several other considerations about the per $100 rate, as well as policy fees, need to be considered, however. The next section discusses these additional issues.

Other Components of Actuarial Rates

The formula for actuarial rates discussed in the previous section is not the complete actuarial rate-setting formula. Mathematically, the more complete formula is:

$$\left(\sum_{m}^{M}\left(PELV_i * DELV_i\right) * LADJ * DED * UINS\right) / EXLOSS$$

Here, additional variables are included to take into consideration several issues or effects that are important for modifying expected losses or for building additional expense items into the rates. The rest of this section describes each of these additional variables.

The Loss Adjustment Factor—LADJ

Rates are "loaded," or adjusted upwards, by approximately 4.2 percent to account for costs associated with claims and loss adjustment. This is called the loss adjustment factor, or LADJ, in the actuarial formula. Data on previous years' costs for these tasks are used to develop the LADJ factor, which can change from the 1993 level of 4.2 over time.

The Deductible Offset—DED

Currently, the deductible is $500 for most actuarial policies.[9] This means that the first $500 of any claim that is filed is not covered under the program's policies. The fact that some portion of each claim will not be covered needs to be taken into account so that rates can be adjusted downward to reflect a lower risk to the program in insuring properties for flood loss. To do this, FIA uses a formula that converts the dollar level of the deductible, which was $500 in 1993, into a factor for the rating formula. This formula is based on experience data on the degree to which losses have been reduced due to the deductible, with any adjustments necessary to account for the current policies in force and inflation.[10] Currently, the deductible factor is approximately .95 for structures that accommodate one to four families, meaning that rates, per $100 of insured value, are reduced by about 5 percent due to the existence of the $500 deductible.

The Underinsurance Factor—UINS

The basic (PELV*DELV) relationship implicitly assumes that all policies are for full insurance, meaning that each policy covers the full value of the insured property. However, this may not be the case. The fact that people often underinsure causes the risk, per $100 of insurance premium, to be greater, since claims are more likely to be made against the first few thousand dollars of insurance coverage. Therefore, with underinsurance, the per $100 rate of insurance needs to be higher than in the full insurance case. The UINS factor adjusts rates for the degree to which people, on average, underinsure. FIA uses experience data on underinsurance factors and claims data since 1978 to develop the UINS factor for different zones and types of structures. More recent experience is given a greater weight in determining UINS factors. According to FIA officials, rates are currently adjusted upwards by about 20 percent due to underinsurance.

Expense Items—EXLOSS

EXLOSS is a factor that loads rates for certain expenses, such as agents' commissions, certain costs of policy sales, as well as for contingency costs due, for example, to risk of unknown hazards. The factor was equal to .74 in 1992 for the AE zone, so that rates are increased by over 30 percent due

[9]Lower flood insurance rates are available if the policyholder agrees to have a significantly larger deductible. This type of policy is not very common, however.

[10]If the level of the deductible does not change, the rise in the general price level will cause the percent of damage that the deductible represents to decline. That is, a constant deductible will represent a smaller percentage of expected claims damage over time. Therefore, the formula underlying the DED factor takes into account the effect of inflation.

to estimated EXLOSS costs.[11] The costs accounted for in EXLOSS are those that are related in part to the amounts of insurance that people are buying and the price (that is, the rate) for that insurance.[12]

Examples of Flood Insurance Rates

This section contains examples of flood insurance rates to show how risk factors considered in the application of the hydrologic model result in differences in actual flood insurance rates. As noted throughout this appendix, rates are set for several categories of properties defined by the key characteristics of flood risk, including the zone within which the property lies; the elevation of a structure relative to the BFE; and the type of structure. Another issue, however, has not been previously discussed—rate differences between rates for "basic" limits coverage and rates for "additional" limits coverage.

Basic limits rates apply to the first $45,000 dollars of insurance that is purchased by a policyholder for a single-family structure. If the buyer purchases more than $45,000 of coverage, the additional limits rates apply on any coverage over that amount.[13] The reason that rates differ depending on the amount of insurance that is purchased is that claims are more likely to be made against the first several thousand dollars of coverage; therefore, rates for basic limits coverage need to be considerably higher than rates for additional limits. The formula discussed earlier, with several important differences in the treatment of underinsurance considerations, is used to determine rates on both basic limits and additional limits. Since the probability values for floods creating very high levels of damage are lower, the formula generates rates for additional limits that are considerably less than basic limits rates.[14]

[11]For V-rated zones, EXLOSS was only .69 in 1992 because FIA builds in higher contingency costs for these zones.

[12]Two additional fees are added into premiums. These fees are not part of the rate per $100, but rather are added into each policy as flat fees no matter how much insurance a particular policyholder is buying. These fees cover certain expenses spread equally over all policies, as opposed to risk-related costs. The "expense constant," a $45 per policy charge, recaptures certain costs that are incurred in writing flood insurance policies. In addition, the "federal policy fee," a $25 per policy charge, supports flood insurance studies, floodplain management activities, and the administration of the program by the federal government.

[13]Over time, FIA has adjusted the level of insurance sold at basic limits rates. FIA uses experience data to determine the appropriate level at which rates per $100 of insured value should decline. In setting the $45,000 level, FIA examines available data on past claims and looks for a natural break in the relationship between premiums and losses. The rise in the price level over time will cause that break to rise.

[14]It would actually be more accurate to have several rate levels that decline as a higher level of insurance is purchased. FIA officials told us, however, that they use only two rate levels for simplicity, so as not to complicate the work of insurance agents in pricing insurance for the potential insured.

Zones A1-A30, AE

The majority of post-FIRM structures lying within the 100-year floodplain are in what is currently called the AE zone. At one time, there were 30 numbered A zones, each of which was charged different rates. Because rate differences across these zones were very slight for post-FIRM properties, FIA now rates all numbered A zones together and has renamed the zone AE. Zone AE has many different post-FIRM rates, depending on the certain characteristics of the structure. In table II.1, we show rates for a one-floor, no-basement, single-family structures in the AE zone. In addition, the table shows rates for building coverage, as opposed to rates for contents coverage (which are generally higher). The table shows rates for both basic limits coverage—coverage up to $45,000—and additional limits, which is the rate for coverage over $45,000.

Table II.1: AE Zone Premium Rates for Certain Structures Per $100 of Insured Value

Elevation of lowest floor above or below BFE	Rate for basic limits	Rate for additional limits
+3 or more	$0.14	$0.06
+2	0.16	0.06
+1	0.21	0.06
0	0.33	0.06
-1	0.86	0.06

Note: These are the rates for a one-floor, single-family building without a basement.

Zones V1-V30, VE

As with the numbered A zones, the original 30 numbered V zones have been combined and renamed zone VE. Less than 2 percent of post-FIRM structures are in the VE zone, which includes coastal areas subject to wind and wave action. In table II.2, we show rates for a structure in the V zone that is in compliance with the program's current building standards for the V zone. In the V zone, rather than having basic limits and additional limits rates, there are three sets of rates; the rates depend on the degree of underinsurance, relative to the replacement cost of the structure, that the policyholder has purchased. FIA uses this rate structure for the V zone because rates are high, and people have a greater tendency to underinsure. The rate structure in V zones gives people an incentive to insure more fully, since rates per $100 of insured value are lower the greater the coverage one buys: The table shows that rates in the V zone are substantially higher than in the A zone.

Table II.2: VE Zone Premium Rates for Certain Structures Per $100 of Insured Value

Elevation of lowest floor above or below BFE	Structure is insured for		
	75 percent or more of replacement cost	50 to 74 percent of replacement cost	Under 50 percent of replacement cost
+4 or more	$0.36	$0.48	$0.71
+3	0.41	0.56	0.83
+2	0.53	0.71	1.06
+1	0.71	0.96	1.35
0	0.93	$1.25	1.69
−1	$1.23	$1.63	$2.12

Note: These rates are for a one-floor, single-family building without a basement.

Outside the Identified 100-Year Floodplain

Most properties not in the identified 100-year floodplain are in zone X, which includes properties outside of a special flood hazard area, or the 100-year floodplain.[15] One of the most important differences in rates in the X zone is that they are not set using the hydrologic model. Rates are the same across the entire zone for a given type of building, since BFEs are not defined within the zone. Table II.3 gives examples of building rates in the X zone for single-family structures with no basement.

Table II.3: Zone X Premium Rates for Certain Structures Per $100 of Insured Value

Basic limits	Additional limits
$0.25	$0.07

Note: These rates are for a one-floor, single-family structure without a basement.

[15]Zone X includes areas that used to be classified as either zone B or C.

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