Understanding the National Flood Insurance Program in New Jersey

Report Prepared for
New Jersey Realtors® Governmental Research Foundation
January 2017

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NEW JERSEY REALTORS®

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The authors would like to thank the New Jersey Realtors® Governmental Research Foundation for supporting this work, and Austin Perez and John Miller for helpful feedback on the content of this report.

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1. INTRODUCTION

The federal National Flood Insurance Program has been providing flood insurance to residents of participating communities since 1968. Communities voluntarily join the program, adopting and enforcing minimum floodplain regulations, and in exchange their residents are eligible to purchase flood insurance. Currently, a flood insurance policy is required for any property located in a 100-year floodplain with a mortgage from a federally backed or regulated lender. The program has grown substantially over the decades. As of June 2016, more than 5.08 million policies were in force nationwide, representing slightly less than $1.245 trillion in coverage. New Jersey currently ranks fourth in the nation (behind Florida, Texas, and Louisiana) in the number of NFIP policies in force and third (behind Louisiana and Texas) in the total value of claims paid. The NFIP thus plays an important role in providing financial protection against flood events to New Jersey residents.

From its inception, the NFIP has had multiple objectives [see: 1]. These include encouraging community participation in the NFIP, encouraging community investment in flood risk reduction measures, increasing insurance purchase, and setting premiums to ensure a fiscally sound program. In reality, however, the program has had to make trade-offs among these multiple objectives. To encourage purchase of insurance, for example, the NFIP historically offered premium discounts for certain classes of policyholders. This and other components of its pricing strategy (discussed in more detail below) meant that the NFIP was not collecting enough revenue to cover losses from catastrophic loss years, such as 2005. The program paid out more in claims after Hurricane Katrina than it had over the life of the program to that date, and in so doing, went billions of dollars in debt to the US treasury. It has yet to pay back that debt, and the payouts after Hurricane Ike and Superstorm Sandy only exacerbated the program's precarious financial position.

In response to the massive debt, as well as other ongoing concerns about the program, Congress passed the Biggert-Waters Flood Insurance Reform Act in July 2012, with overwhelming bipartisan support. This piece of legislation called for increases in rates for many policyholders who had previously received discounts on their flood insurance. Combined with new flood maps being produced in several states—including New Jersey—designating some additional areas as high risk, many communities became concerned about the affordability of flood insurance and the effects that new rates and new maps would have on their residents. Thus, in 2014, Congress again passed NFIP reform legislation—the Homeowner Flood Insurance Affordability Act. This reinstated price discounts for those homeowners mapped into a higher-risk flood zone as a result of map updates, put all properties on different paths for phase out of price discounts currently given to older homes (see Section 4.3), as well as making other changes. The NFIP will be up again for reauthorization in 2017.

This report looks at how the NFIP operates in New Jersey and how price changes will affect New Jersey residents. Section 2 provides background on the general structure and operation of the NFIP. Section 3 examines the NFIP in New Jersey, looking at trends and patterns in policies, premiums, and claims paid. Section 4 provides a detailed discussion of how the NFIP sets rates and how rates are changing with the 2012 and 2014 legislation. In Section 5, we simulate 2016 NFIP annual premiums for example New Jersey homes. Section 6 concludes. The appendices present (A) flood zone definitions; (B) detailed premium calculations for three example properties; and (C) a list of abbreviations.

2. OVERVIEW OF THE NATIONAL FLOOD INSURANCE PROGRAM

The NFIP, now housed in the Federal Emergency Management Agency, was created in 1968 partially in response to a lack of flood coverage in the private market. This is because floods violate some of the ideal conditions of insurability [2, 3]. In particular, flood insurance can be subject to adverse selection, with only the riskiest properties insuring. Losses are also correlated—when a large flood occurs, many properties are all damaged simultaneously—and can be catastrophic. These aspects of flood losses can make it difficult for the private sector to insure against floods, and when private coverage is available, it can be expensive, perhaps more than households are willing or able to pay [4]. At the time the NFIP was created, some observers argued that the government could overcome many of these challenges, particularly by better pooling risks, setting rates to encourage broader participation, and incentivizing risk reduction measures [5].

Since its conception, the NFIP has always had multiple objectives. In presentations and outreach materials, FEMA has previously compared the NFIP to a four-legged stool. Provision of flood insurance is only one of the legs. The second is promoting floodplain management, which is achieved through community regulations. The third is mapping of flood hazards on flood insurance rate maps. The final leg is hazard mitigation, promoted through grants and community incentives.

FEMA FIRMs delineate different flood risk zones (see Appendix A for flood zone definitions). Areas modeled as the 1 percent annual chance floodplain, or 100-year flood zone, are referred to as Special Flood Hazard Areas. These are divided into two broad groups: A zones and V zones. A zones are inland high-risk areas, and V zones are subject to breaking waves of three feet or more. FEMA also maps the 500-year floodplain (referred to as the shaded X zone, formerly the B zone) and areas outside both SFHAs and 500-year floodplains (referred to as the unshaded X zone, formerly the C zone).

Communities can voluntarily choose to join the program. There are now over 22,000 participating communities, covering almost all areas of flood risk in the country. When a community joins, it must adopt minimum floodplain management regulations established by the program [6]. The required regulations vary according to the flood zone but include the following features: (1) the community must require that all new development in SFHAs obtain a permit; (2) new development in floodways (the central portion of a floodplain that carries deep and/or high velocity flows) must not be permitted if it increases flood heights; and (3) all new construction, or substantially improved or damaged properties in SFHAs, must be elevated so that the lowest floor is at or above base flood elevation,[1] which is the estimated height of floodwaters in a 100-year flood (nonresidential structures can also be dry flood proofed). In V zones, additional building requirements apply. All regulations must use the most recent locally adopted FEMA maps. FEMA regional offices or NFIP State Coordinating Agencies provide model ordinances for adoption.

Once communities adopt those regulations, residents are eligible to purchase flood insurance through the program. Single-family homeowners (and two- to four-dwelling residences) can purchase up to $250,000 of building coverage and $100,000 of contents coverage. Nonresidential policies can insure both structure and contents up to $500,000 each. Minimum deductibles vary by policy type but are at least $1,000, with higher ones available.

FEMA has contracts with private companies, referred to as write-your-own companies, to write policies with individual property owners and process claims. The companies are compensated for this effort but bear none of the underwriting risk, which is held by FEMA. The Government Accountability Office [7] has found that the NFIP pays one-third to two-thirds of annual premium revenue to WYO companies. The WYO allowance, as a percentage of written premiums, is roughly 15 percent agent commissions, 2.3 percent voluntary payment of state premium taxes, and 12.5 to 13.5 percent company expenses. The extent to which the WYO allowance may be overly generous has been the subject of ongoing debate.

[1] Some communities may require higher elevations.

2.1. Participation

Participation in the early years of the program was low. This led Congress to introduce lower rates for certain policyholders. Congress also passed the Flood Disaster Protection Act in 1973, amending the 1968 act and establishing the mandatory purchase requirement, which states that a homeowner with a loan from a federally backed or regulated lender in a SFHA must purchase insurance. Other property owners can choose whether to purchase an NFIP policy. The law also requires communities to participate in the program to be eligible for federal disaster assistance. (The National Flood Insurance Reform Act of 1994 added the requirement that property owners in SFHAs must purchase flood insurance if they receive federal disaster aid from a Presidentially declared flood disaster.) The Housing and Community Development Act of 1974 added a notification requirement to the mandatory purchase requirement: federally regulated lenders must inform a borrower if their property is located in a SFHA.

From the program's inception, Congress has always had a goal of having most floodplain property owners purchase flood insurance, but in practice this has been difficult to achieve. The evolution of policies in force in the program by year is shown in Figure 1. Recent years have seen a decline in the number of policies nationwide; some observers have speculated this might be due to the recent price changes in the program. Rate setting in the NFIP, including the recent price changes, is discussed in detail in Section 4. Premiums vary by flood zone, type of property (single family, commercial, etc.) as well as certain characteristics of the insured structure. In addition, certain classes of policyholders have received lower rates. The largest group consists of pre-FIRM properties, built before the flood risk in a community was mapped. These discounts are slowly being eliminated under reform legislation passed in 2012 and 2014.

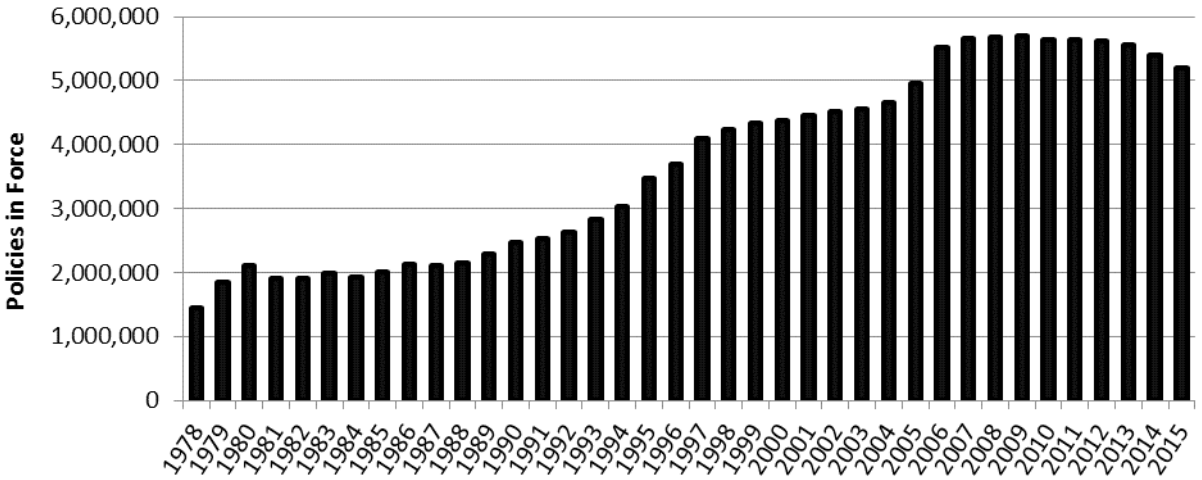
Although the number of policies in force has generally increased over time, it is difficult to determine how well the mandatory purchase requirement is working because of a lack of nationwide data on the number of properties within 100-year floodplains and the number of those with a mortgage from a regulated lender. An estimate of take-up rates from a random sample of homes across the United States by the RAND Corporation a decade ago suggests that about half of single-family homes in 100-year floodplains have flood insurance. This average masks high regional variation, with the Midwest having the lowest take-up rates—20 to 30 percent—and the South and West having take-up rates closer to 60 percent [8]. An estimate of take-up rates in census tracts along the New Jersey and New York coasts immediately preceding Superstorm Sandy suggests market penetration rates were generally in the range of 5 to 50 percent, with a few coastal tracts having take-up rates up to 75 percent [9]. Again, lack of data on housing in SFHAs makes these percentages underestimates of the take-up rate in just the highest risk areas.

The NFIP cannot refuse coverage to any property, including those that sustain flood damage repeatedly. The NFIP defines a repetitive loss property as an insurable building with two or more claims exceeding $1,000 paid by the NFIP within a 10-year rolling period. Severe repetitive loss properties are defined as structures with four or more claims of at least $5,000 each (building or contents), or at least two separate claims (building only) whose cumulative amount exceeds the value of the property. Both definitions specify at least two claims within a 10-year period and more than 10 days apart. GAO reported in 2004 that repetitive loss properties are only 1 percent of policies in force but have accounted for around 38 percent of the paid claims by the NFIP between 1978 and 2004 [10].

The NFIP is by far the largest provider of flood insurance in the country and the state of New Jersey. That said, there is an emerging private market, and a few private companies write flood insurance in New Jersey. Some of these only write coverage in excess of the NFIP caps, but others may write the entire flood policy.[2] At least one company writing flood policies in New Jersey is a surplus lines carrier, meaning it is not backed by the state guarantee fund. This report focuses on the NFIP and not the small, private market.

[2] A list of companies writing flood policies in New Jersey is available on the website of the Department of Banking and Insurance: www.nj.gov/dobi/division_consumers/insurance/homeownercontacts.htm#flood

FIGURE 1. NFIP POLICIES IN FORCE NATIONWIDE, BY YEAR



2.2. Hazard Mitigation

Hazard mitigation of properties has been undertaken to reduce claims to the NFIP. The Flood Mitigation Assistance Program is a grant program that funds flood hazard mitigation that can be shown to be in the financial interest of the NFIP [11]. It was established in 1994 to reduce or eliminate NFIP claims and has been used to mitigate RL properties.[3] In FY 2014, $89 million was available in this program. The Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 took additional steps to mitigate SRL properties.The act authorized using funds to mitigate SRL properties, and if SRL property owners refused a mitigation offer, their insurance premiums would increase.

The NFIP also has a voluntary program called the Community Rating System, which rewards communities that take actions to lower their flood risk. Established in 1990, the CRS awards points to communities for activities in four areas: (1) public information activities; (2) mapping and regulations; (3) flood damage reduction activities; and (4) warning and response. As a community accumulates points, it moves up through levels in the program, from class 10 to class 1. At each new class level, SFHA residents in the community receive another 5 percent discount on NFIP premiums, up to 45 percent.

Outside the SFHA, residents of classes 7–9 receive a 5 percent reduction in premiums and those in classes 1–6 receive a 10 percent reduction in premiums. As of spring of 2014, 1,296 communities nationwide participated in the CRS program. Although these are only 5 percent of all communities in the NFIP, they represent more than 67 percent of all policies in force [12].

New Jersey has 552 NFIP-participating communities.[4] Of these, about 15 percent have participated or continue to participate in the CRS.[5] As of April 2016, the highest rating for a New Jersey community was 5, a class that makes SFHA residents eligible for a 25 percent reduction in premiums. Class 5 ratings have been attained by Avalon, Beach Haven, Brigantine, Lincoln Park, Long Beach, Longport, Mantoloking, Margate, Ocean City, Pompton Lakes, Sea Isle City, Stafford, Stone Harbor, and Surf City.[6]

[3] Note that previously there had been separate programs for these properties, but the 2012 reform legislation consolidated them.

[4] Federal Emergency Management Agency, "Community Status Book Report: New Jersey." Available at: www.fema.gov/cis/NJ.html

[5] Sixty-four are current and 18 are rescinded. Communities with rescinded status are class 10 and receive no discount.

[6] For a full listing of New Jersey communities in the CRS, see the most recent flood insurance rate manual. The April 2016 manual is online at: www.fema.gov/media-library-data/1458756801023-311019d76271533f6b21ce505df7bd3c/20_crs_508_apr2016.pdf

3. OVERVIEW OF THE NFIP IN NEW JERSEY

As of June 30, 2016, the NFIP had 232,184 policies in force in New Jersey, representing $56.83 billion in coverage. Between 2013 and 2016, New Jersey saw a slight decline in policies in force, but between 2011 and 2013, the number had been increasing. Figure 2 shows the most recent counts of policies in force by NFIP community (equivalent to New Jersey municipalities). This figure shows simply raw counts of policies and it is clear they are much higher near the coast, likely due to the risk of storm surge and coastal flooding.

Rate setting will be discussed in detail in Sections 4 and 5. Here, we simply present some summary statistics of premiums paid by single-family New Jersey policyholders in 2014 (the most recent year for which policyholder-level data is available). Note, these rates include lower rates given to grandfathered and pre-FIRM properties. Table 1 shows annual premiums paid by single-family New Jersey policyholders for various levels of coverage purchased. In 2014, single-family policies were three-quarters of all policies in the state. The table shows the median and mean, as well as the 1st and 99th percentiles to give a sense of the lowest and highest premiums that a New Jersey household paid in 2014. From the table, we see that across all single-family policies in the state, the median premium was $600 and the average was $1,064, indicating the presence of some higher outlier premiums pulling up the mean: this is a skewed distribution. For all single-family policies, the 99th percentile was greatest when building coverage was in excess of $200,000; in this case, the highest premiums are close to $4,000. Policies for 2-4 family residential units were roughly 13 percent of policies in New Jersey in 2014. For this group, the mean premium was $1,176 and the median was $764 (not shown in table). As we discuss in Section 5, annual premiums have gone up for some policyholders since 2014 and will continue to do so for certain policy classes. Snapshots of 2016 rates are presented in Section 5. Premiums vary by the flood zone of the property and are higher in SFHAs, where the risk of flooding is greater.

FIGURE 2. NFIP POLICIES IN FORCE IN NEW JERSEY, BY COMMUNITY

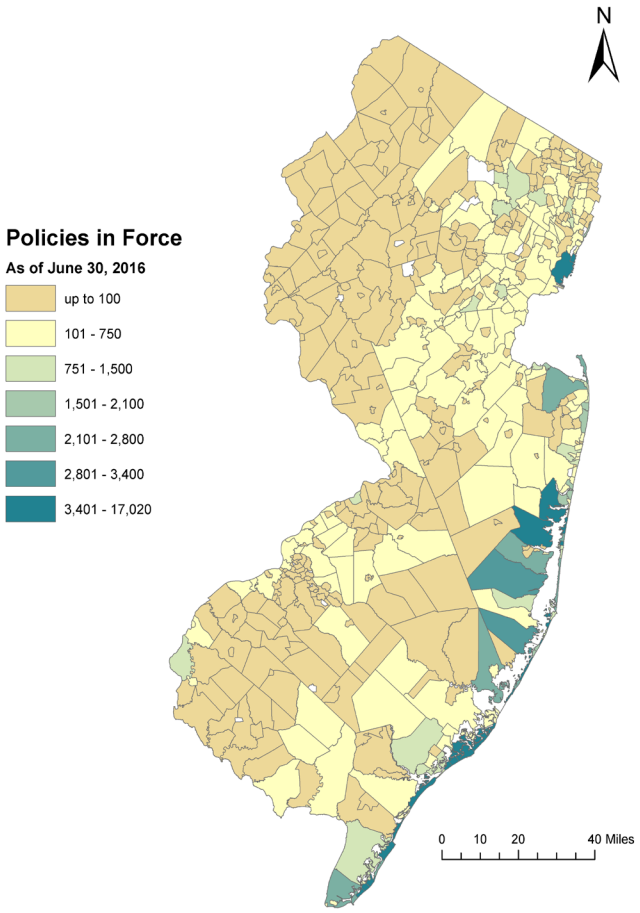


Table 2 shows 2014 premiums in New Jersey by flood zone. The mean premium outside the SFHA is $492, while it is $1,224 in A zones. The highest premiums are paid in V zones. Here, the mean premium is $3,958 and the 99th percentile is $10,269 (for A zones the 99th percentile is $3,755). When we look at the policies with 2014 premiums above the 90th percentile in V zones (which is a premium of $7,472), we find that only 25 percent are primary residences and only 20 percent are post-FIRM. This indicates that the high rates tend to be paid on properties that are second homes and/or built before the first flood maps were available. We do not know their grandfathering status. For 17 percent of these policies there are no elevation data available, but for the remainder, 47 percent are below BFE, indicating they were built before the current regulations, and another 22.5 percent are at BFE. Finally, the mean amount of building coverage for this group is $247,800—very close to the maximum of $250,000. It is worth emphasizing that V zones are often a narrow patch of coastal land and accounted for less than 1 percent of all New Jersey policies in 2014. Thus, very few residents face these rates. Figure 3 shows a map of flood zones in New Jersey from the effective FIRMs as of early July 2016 (note that some counties did not have their maps yet digitized; these are shown in gray as no DFIRM, or digital FIRM).

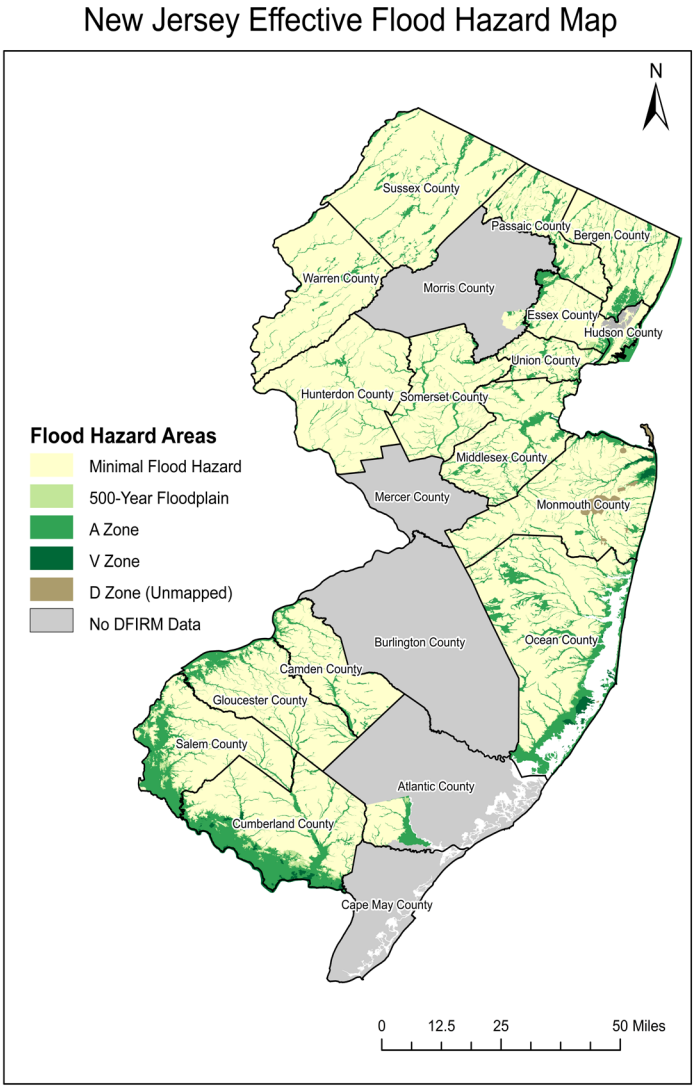
TABLE 1. 2014 PREMIUMS FOR SINGLE-FAMILY NEW JERSEY HOMES, BY COVERAGE LEVEL

	Annual premium	*Annual premium if building coverage < $100,000*	*Annual premium if building coverage > $200,000*	*Average annual cost per $100 of coverage*
1st percentile	$154	$81	$237	$0.10
Median	$600	$588	$528	$0.30
Mean	$1,064	$537	$1,127	$0.53
99th percentile	$3,804	$1,445	$3,989	$1.82

TABLE 2. 2014 PREMIUMS FOR SINGLE-FAMILY HOMES, BY FLOOD ZONE

	Annual premium outside SFHA	*Annual premium in all A zones*	*Annual premium in all V zones*
1st percentile	$149	$181	$301
Median	$438	$875	$3,408
Mean	$492	$1,224	$3,958
99th percentile	$1,997	$3,755	$10,269

FIGURE 3. EFFECTIVE NJ FLOOD INSURANCE RATE MAP



Note: This shows the effective FIRMs as of July, 2016. FEMA is in the process of updating the FIRMs for coastal areas of New Jersey. At the time of writing, only Salem County and Cumberland counties had adopted these new maps. Flood zone definitions are given in Appendix A.

We turn now to look at NFIP claims paid in the state. Between 1978 and the spring of 2015, New Jersey received more than $6.1 billion (in 2015 dollars) in claims payments from the NFIP. Reflecting the large proportion of single-family NFIP policies in New Jersey, 77 percent of these claims were for single-family homes. Another 12.5 percent were paid to two- to four-family homes, 2.9 percent to other categories of residential policies (e.g., mobile homes), and 7.4 percent of claims were paid to nonresidential policies (commercial or government buildings). Figure 4 shows the total NFIP claims paid by year in New Jersey, all adjusted to 2015 dollars using the consumer price index. The figure shows that total paid claims in 2012 from Superstorm Sandy were dramatically more than the state had experienced in any other year. Claims in 2012 account for 65 percent of all paid claims to the state over this time period.

NFIP claims are not evenly distributed across the state, as flood risk, exposure, and take-up rates of NFIP policies are not constant across the state. Figure 5 shows the top 10 NFIP communities in New Jersey ordered by total claims payments received (in 2015 dollars) between 1978 and mid-2015. First is the Township of Toms River, which has received $544 million. This is more than twice as much as the second highest community, the Township of Brick.

The outlier nature of Sandy can again be seen if we focus on paid claims that were for the NFIP maximum coverage level of $250,000. This indicates a substantial amount of flood damage (note that the property owner would have needed to purchase the maximum amount of coverage to be paid at this level). No single-family homes in the state had claims payments at this level until 2004. For the years 2004, 2005, 2006, and 2011 there were, respectively, 1, 2, 1, and 9 claims at the coverage cap. In 2012, however, there were 625.

FIGURE 4. NFIP CLAIMS PAID IN NEW JERSEY, BY YEAR

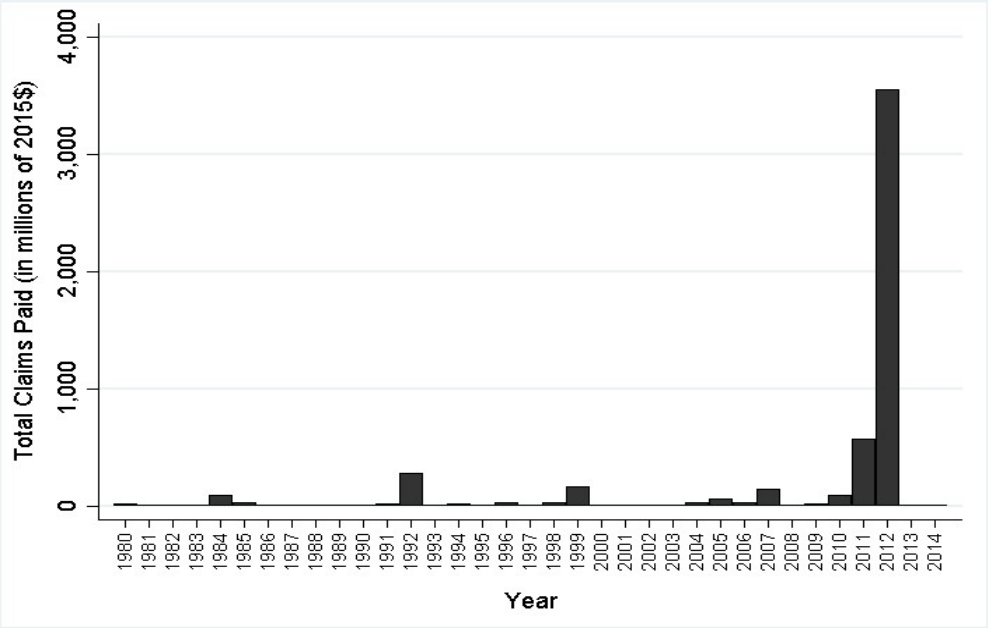


FIGURE 5. TOP 10 NFIP COMMUNITIES BY CLAIMS PAYMENTS, 1978-MID-2015

Roughly 3 percent of claims were missing data on the value of the structure. For the remaining claims, again limiting attention to single-family homes, 50 percent of claims over all the years were for 10.5 percent or less of the building's value. However, 10 percent of claims were for more than 60 percent of the building's value. Figure 6 shows the median paid claim by year. The figure again highlights the extreme nature of Superstorm Sandy. Between 1978 and 2014, the median paid claim for single-family homes in 2015 dollars was $16,853, and the mean claim was $35,883, indicating some very high claims payments pulling up the mean. When we compare pre- and post-FIRM paid claims separately, we find that the median claim for post-FIRM properties is $14,387, and the median claim for pre-FIRM properties is somewhat higher, at $17,930.

Table 3 shows claims by flood zone. Remembering again that most policies are in A zones and very few are in V zones, we see that the highest claims are to V zone properties, and it is in V zones where the outlier claims of very high amounts occur (this also means V zone residents are purchasing high amounts of coverage).

Although coastal areas have most of the policies and receive most of the claims, V zones are only a small percentage of these communities. Table 4 shows the percentage of total claims—for all residential policies, not just single family—and total claim dollars by flood zone over all years, as well the percentage of total policies and premiums in 2014 as a point of comparison (note that the 2014 distribution of policies and premiums across zones may not reflect their historic distribution, as in the first two columns covering claims). The majority of policies and claims are in A zones.[7]

RL and SRL properties are known to account for a disproportionate share of claims. As of the end of September 2014, New Jersey had 15,237 RL buildings, with 10,613 of those insured. New Jersey is fourth in the nation for the number of RL properties, behind Louisiana, New York, and Texas. Of the insured RL buildings, only 858, or roughly 8 percent, were post-FIRM and in the SFHA, indicating that many of the repeat loss properties are also pre-FIRM. As of end of September 2014, RL properties in New Jersey had had more than $1.13 billion in insured losses.

[7] Coastal AE zones are subject to breaking waves of 1.5 to 3 feet. While pricing is the same as other AE zones, the state may have different building regulations to account for this wave energy.

FIGURE 6. MEDIAN FLOOD CLAIM IN NEW JERSEY FOR SINGLE-FAMILY HOMES, BY YEAR

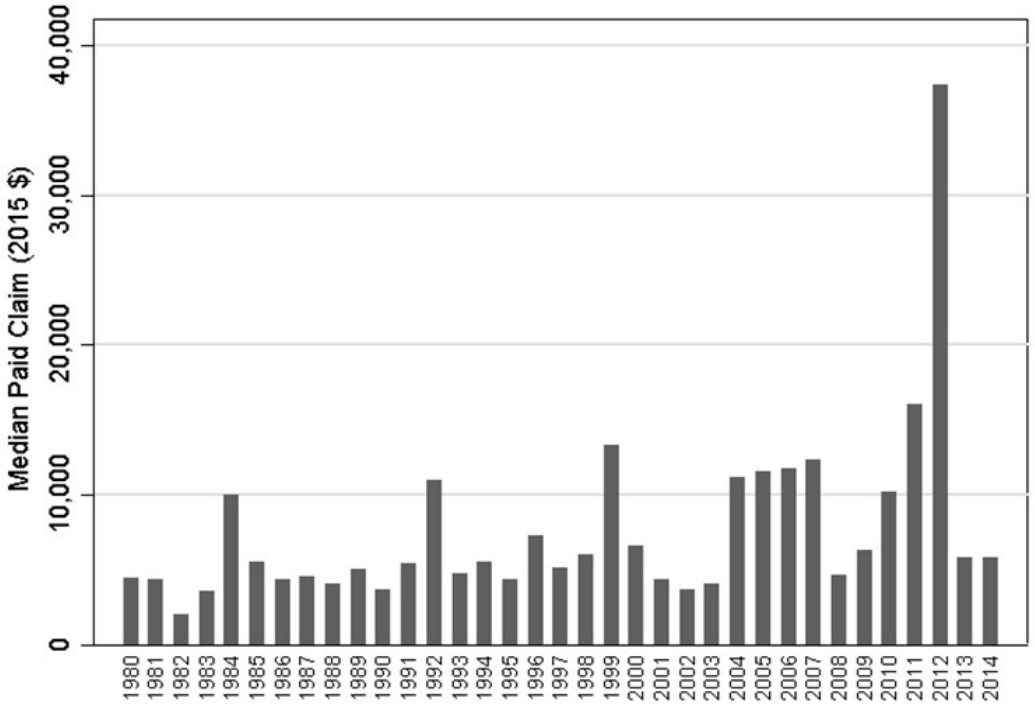


TABLE 3. TOTAL CLAIMS (BUILDING & CONTENTS) FOR SINGLE-FAMILY HOMES 1978-2014, BY FLOOD ZONE (2015 US$)

	Median claim	*Mean claim*	*95th percentile*
Outside the SFHA	$10,345	$25,200	$103,742
All A zones	$18,052	$37,028	$127,957
All V zones	$21,809	$54,957	$258,083

TABLE 4. RESIDENTIAL CLAIMS AND POLICIES BY FLOOD ZONE FOR NEW JERSEY

	Percent of total number of claims 1978-March 2015	*Percent of total paid claim dollars 1978-March 2015*	*Percent of policies in force in 2014*	*Percent of premiums in force in 2015*
Outside the SFHA	11.3	7.3	20.4	9.4
All A zones	87.6	91.3	77.1	86.9
All V zones	1.1	1.4	0.8	2.8

4. PRICING IN THE NFIP

This section describes NFIP pricing: first the full-risk rate structure within the SFHA, then rates outside the SFHA, and finally the classes of policyholders that receive premium discounts. We discuss the changes from the Biggert-Waters Flood Insurance Reform Act of 2012 and the Homeowner Flood Insurance Affordability Act of 2014 (HFIAA14). BW12 reauthorized the NFIP for five years, through September 30, 2017; since 2008 the program had been operating under multiple short-term extensions and had even been allowed to lapse. BW12 would have increased rates substantially and abruptly for some homeowners. As the new rates were beginning to be phased in—particularly in response to new FEMA maps, such as those being produced for the region damaged by Sandy—concern began to mount regarding the affordability of flood insurance. Some homeowners felt that the proposed premium increases were unjustified and/or unaffordable. In response, Congress passed HFIAA14. This law repealed and modified certain provisions of BW12 related to pricing. BW12 and HFIAA14 made several changes and modifications to the program; the focus in this report is on the pricing changes.

4.1. NFIP Risk-Based Rates in the SFHA

The majority of policies pay NFIP full-risk rates. FEMA defines a full-risk premium rate as one "charged to a group of policies that results in aggregate premiums sufficient to pay anticipated losses and expenses for that group."[8] These rates are not subject to any of the price discounts discussed in Section 4.3, although they may qualify for CRS discounts if applicable. NFIP full risk rates may not be equivalent to private sector rates, however, for a variety of reasons [see: 13]. The NFIP classifies the first $60,000 of building coverage for single-family homes ($175,000 for businesses) as the "basic limit" and charges higher rates per $100 of coverage for coverage under this amount, since losses are more likely to occur in this range.

The NFIP full-risk rating method used by FEMA for properties in SFHAs is based on a hydrologic model coupled to damage curves. The probabilities of various-magnitude floods are modeled, and curves that relate these probabilities to damages based on the value of the property and characteristics of the structure (such as elevation) are used to estimate expected damage. The same rate is applied to properties that have similar characteristics. Rates are not geographically differentiated. In 2008, GAO raised concerns that some of the data used in FEMA's modeling was outdated or inaccurate. FEMA has been updating FIRMs and making other improvements, but certain items, such as probability estimates of floods, have not been updated in some time [14]. A recent study released by FEMA, based on models from a private sector catastrophe-modeling company, found that more than 40 percent of properties exposed to storm surge were not located in an SFHA [15].

Inside an SFHA, full-risk rates vary according to the type of property (e.g., single-family residential, commercial, etc.), flood zone, characteristics of the building (e.g., number of floors; presence and type of basement or crawlspace), elevation of the building above/below BFE, amount of coverage purchased, and the deductible chosen. For post-FIRM, V zone properties, rates also vary by year of construction, the presence or absence of obstructions,[9] and the replacement cost ratio (RCR; the amount of building coverage purchased through NFIP divided by the replacement cost of the building).

[8] See: www.fema.gov/national-flood-insurance-program/definitions

[9] A building is deemed to have an "obstruction" if the area below the lowest elevated floor is enclosed by breakaway walls (see: www.fema.gov/breakaway-wall), is enclosed by two or more breakaway walls and remaining sides are of certain materials (such as screening or lattice), or when equipment below the lowest elevated floor is above the BFE. See rating manual for more details.

Premiums are then adjusted by several factors. First is a loss adjustment factor, which covers the costs of loss adjusters and special claims investigations. Second is a deductible offset (premiums are lower for higher deductibles), and third is an underinsurance factor, which accounts for the fact that many policyholders do not insure to value (and rates are calculated based on full values), making lower claims more likely. Finally, an expected loss ratio adjustment loads rates for agents' commissions and other expenses, and a contingency loading of 10 percent of premiums is applied in A zones and averages 20 percent in V zones (loadings in V zones increase as structures fall further below BFE). The NFIP does not include a loading for the cost of capital, as a private firm would do, nor does it price to account for the risk of its aggregate portfolio.

4.2. Rates Outside the SFHA

For properties outside the SFHA, the NFIP has two primary rates: X zone and Preferred Risk Policy rates. Zone X comprises areas both within (labeled shaded X on FEMA maps) and outside (unshaded X) the 500-year floodplain; rates are the same in both. Outside SFHAs, rates are based on actuarial and engineering judgments based on the results of the rate model and historical experience, since FEMA deems the cost of developing detailed frequency-magnitude relationships in these areas as too high relative to the benefits [16]. In these zones, FEMA does not rate based on elevation relative to the BFE, and thus rates are not fully risk-based. Zone X is also likely subject to adverse selection in that only the riskiest properties in this zone voluntarily purchase insurance; FEMA accounts for this in the rate. Zone X rates do not distinguish between pre- and post-FIRM.

For properties that have a favorable loss history and are outside the SFHA, FEMA offers PRP rates. These are lower rates for properties that are currently in an X zone and have not had any of the following: two claims of more than $1,000 each, three or more claims of any amount, two federal disaster aid payments of more than $1,000 each, three federal disaster aid payments for separate occurrences for any amount, or one insurance claim and two federal aid payments of more than $1,000 each. PRP rates are offered in certain fixed combinations of building and contents coverage or contents-only coverage. There are different rates for properties with basements and without basements/enclosures. For contents only coverage, properties with contents located above the ground level pay lower premiums.

4.3. Discounted Policies

The largest group of policies paying discounted premiums consists of so-called pre-FIRM properties. At the time the NFIP was created, more than a million structures in the nation's floodplains had been constructed, often without being subject to any building code. Congress, concerned that full-risk insurance rates for these existing structures would be extremely high and not affordable for many households, created a discounted rate structure for preexisting development, referred to as pre-FIRM policies. As of July 2012, there were 5.6 million NFIP policies, with just over 19 percent receiving pre-FIRM discounted rates (Andy Neal, personal communication, July 19, 2012).

Pre-FIRM rates are not set according to the height of the first floor relative to the BFE, as is done for full-risk properties in SFHAs. FEMA does not receive taxpayer funds to offset these lower rates. Even with this discount, most pre-FIRM policyholders are paying more than would be paid under full-risk rating for buildings constructed in compliance with building codes [1]. Pre-FIRM properties sustain more damage and have higher claims than post-FIRM properties [17, 18].

Under BW12, pre-FIRM premiums were to increase 25 percent a year beginning in 2013 for non-primary residences, severe repetitive loss properties, and business properties, until they reached the NFIP full-risk rate. Pre-FIRM rates were to be eliminated for single-family households under the following conditions: a policy lapses, the property is sold, the property sustains substantial flood damage (defined as damage greater than 50 percent of the home's value), the property is substantially improved, or a new policy is purchased. GAO estimated that roughly 438,000 policies nationwide would have seen higher rates immediately; 715,000 policies would have seen their premiums remain at the current level until one of the triggers was met [19]. HFIAA14 eliminated the triggers that

would have led to the loss of pre-FIRM discounts when a property was sold or a new policy purchased and refunded homeowners who had begun to pay premium increases under BW12 that were no longer required. HFIAA14 still requires rates on pre-FIRM properties to increase annually. The increase must be a minimum of 5 percent but cannot exceed 18 percent per year for single-family residences, with limited exceptions. Elevation certificates are required to rate post-FIRM properties. As pre-FIRM rates are eliminated, property owners are encouraged to submit an elevation certificate to the NFIP. Until they do so, their rates will continue to increase. If no certificate is given, their premium could increase beyond their full-risk rate. FEMA is thus encouraging all pre-FIRM property owners to obtain an elevation certificate as this will let them know when it would be beneficial to switch to post-FIRM rates. We examine this further in Section 5.2. Non-primary residences, businesses, SRL properties, and properties substantially damaged or improved with pre-FIRM rates will see their premiums increase 25 percent a year until they reach the full-risk rate.

The second significant group of properties that pay lower rates are grandfathered properties. These properties are given a lower rate if a new map indicates they are at higher risk as long as they maintain a flood insurance policy or, if the property is post-FIRM, if they can demonstrate the home was built in compliance with the hazard map in effect at the time of construction. Zone grandfathering occurs when a property is "mapped into" a higher risk area and can keep the rate of the lower risk zone. When moving from outside the SFHA to inside, a policyholder will be transitioned over time from a PRP to an X Zone rate.[10] There is no long-term grandfathering of PRP rates. Elevation grandfathering occurs when a new map increases the elevation of the mapped 1 percent flood but without changing the zone itself. As an illustration, a property that was previously mapped as being three feet above BFE but is now, according to the revised map, only one foot above could still pay the three-foot above BFE rate. BW12 had eliminated grandfathering, but HFIAA14 reinstated it.

The NFIP tries to recoup the lower rates of grandfathered properties by charging higher rates across all other properties in the zone. This is an explicit cross-subsidization between grandfathered properties and all other properties in the SFHA. It is not clear, however, whether the NFIP is increasing other SFHA policy premiums by an amount equal to the discount from the grandfathered properties, since it has not historically kept data on grandfathered policies.

Currently, a few other small groups pay lower insurance rates. These include post-FIRM properties in V zones constructed between 1975 and 1981, for which premiums do not account for wave action; A99 properties, which are those that will be protected by structural flood control currently under construction (properties receive rates as if it was finished); and AR properties, those protected by a levee that has been decertified, but a restoration plan is in place (properties get charged the rate for outside SFHAs).

4.4 Other Recent Pricing Changes

BW12 contained other provisions aimed at improving the program's ability to cover claims payments from program revenue. It set higher minimum deductibles. It required FEMA to consider catastrophic loss years in calculating the average historical rate. And it directed FEMA to build a reserve fund equal to 1 percent of the sum of potential exposure of all outstanding policies by assessing a fee on policyholders (which varies by type of policy). FEMA is directed to report to Congress on repaying the debt within 10 years.

HFIAA14 requires a $25 fee on all residential policies and a $250 fee on nonresidential policies to help offset the costs of reinstating other classes of lower rates. In this respect, HFIAA14 introduces more cross-subsidization into insurance premiums than the program had prior to BW12. These fees are not subject to any caps on premium increases. The law also requires a maximum deductible of $10,000 for single-family and two- to four-family dwellings. Choosing this deductible would result in a 35 percent discount from base premiums for single-family homes.

[10] Properties are given a PRP rate the first year but with a higher Reserve Fund Assessment and Federal Policy fee. After this, rates increase at no more than 18% a year until the X Zone rate is reached.

5. PRICE SIMULATIONS

In this section we present 2016 NFIP annual premiums for an illustrative example set of single-family properties. We limit our examination to primary residences and look only at the costs of building coverage (contents coverage up to $100,000 is also available through the NFIP). We do not include any discounts due to community participation in the CRS. Appendix B presents a few examples of premium calculations in greater detail, with a breakdown of the different components of the annual premium. All premiums presented in this section were calculated using the most recent Flood Insurance Rate Manual [20] and the Specific Rating Guidelines [21], which took effect April 1, 2016. The premiums give a snapshot of rates for different types of single-family residences as of 2016. At this point, some rate changes from the 2012 and 2014 legislation are already in effect, such as a $25 surcharge and a reserve fund assessment; these are included in the premiums shown below. Following presentation of the premiums for the example properties we present information on the savings (or not) from pre-FIRM rates, how they will be phasing out over time, and an examination of the premium savings provided by grandfathering.

5.1. Price Simulations for Example Homes

In all of the following tables we present annual premium estimates for both $100,000 of building coverage, as well as $250,000 of coverage. Premiums increase with the amount of coverage purchased, but as shown in Appendix B, for certain zones, the rate per $100 of coverage is lower for coverage beyond the first $60,000. Homeowners subject to the mandatory purchase requirement must insure for at least the lesser of the outstanding principal balance of the mortgage, the NFIP coverage cap, or the insurable value of the property. Beyond this requirement, the choice of coverage is up to the homeowner. Some may prefer to have low limits and low deductibles, insuring against more frequent events. Some may prefer higher coverage levels to cover the possibility of more catastrophic damage. Homeowners with higher valued homes will clearly need to purchase more coverage than those with lower valued homes for any purchasing strategy. For reference, the median value of owner occupied housing in New Jersey between 2010 and 2014 as estimated by the US Census is $319,900. Of course, this varies by county. It can be much lower, such as in Cumberland County, where it is $165,700 or much higher, such as in Bergen County where it is $443,500. Across the entire state, the median building coverage purchased by single-family residences in 2014 was $250,000 and the mean was $211,875 (65 percent of single-family policies with some building coverage in New Jersey in 2014 purchased $250,000 of coverage; contents coverage for this group is quite variable with spikes at zero and the maximum of $100,000).

Table 5 presents annual premiums for post-FIRM AE properties with a variety of combinations of deductibles and coverage levels, basements, and number of stories. The table shows that premiums are much lower as a home is elevated above BFE. At two feet above BFE, premiums range for our example homes from about $300 (for the highest deductible and $100,000 of building coverage) to almost $600 (for the lowest deductible and highest coverage). For AE zone properties two feet below BFE, however, premiums can reach several thousands of dollars annually. For properties even further below BFE, premiums would be higher.

Note, however, that new homes (post-FIRM) must be built at or above BFE in the SFHA. Pre-FIRM homes may be below BFE and we discuss these below. If a new map alters BFEs such that a home previously at or above BFE finds themselves now below BFE, they should be able to grandfather a lower rate. We do not have data on the actual elevation of buildings in the SFHA of New Jersey. North Carolina, which collected statewide data on elevations, found that in their state, 45 percent of properties in the SFHA were greater than 2 feet above BFE, 23 percent were 1-2 feet above BFE, 10 were at BFE, 12 percent were 1-2 feet below BFE, and 10 percent were more than 2 feet below BFE [22].

It is difficult to make any statements about how premiums compare to income or housing expenses for families in New Jersey since the NFIP does not collect this data for its policyholders. As a crude point of reference, Census estimates that between 2010 and 2014, the median monthly homeowner costs for those with a mortgage in New Jersey were $2,428. This, however, masks substantial variation. Still, for an AE property at BFE with more than one floor, no basement, $250,000 of building coverage and the minimum deductible, the

annual premium is $1,348 or $112 a month. Having to pay this premium would increase monthly living costs for the median family by roughly 4.5 percent (more for those below the median). That said, for a property below BFE, insurance could be 200-300 percent or more of this estimate of median housing expenses. Also note that for second homes, annual premiums will be $225 higher than those reported in Table 5, since the surcharge put in place by the 2014 legislation called for $25 fees on primary residences and $250 fees on other properties. For more discussion of affordability of premiums in the context of the NFIP in New Jersey, see [23].

We now again consider an AE property but one eligible for pre-FIRM discounted rates, recognizing that these discounts are now being phased out over time. Pre-FIRM rates do not vary with elevation. The minimum deductible is $1,500. For a primary residence, premiums range from about $1,000 with low levels of coverage to more than $3,500 for the highest coverage level. Rates are higher if the property is not a primary residence or is a severe repetitive loss property.[11] For these properties, the premium ranges from around $2,000 at low coverage levels to $4,000–$6,000 for the maximum coverage. Different rates apply if a building has been substantially improved—that is, it has undergone reconstruction, rehabilitation, addition, or other improvement costing 50 percent or more of the building's previous market value. If the improvement occurred before April 1, 2015, a substantially improved property is rated as post-FIRM. If it occurred after that date, it faces the rates in Table 6. Note that if a pre-FIRM property is above BFE, obtaining an elevation certificate and using post-FIRM rates can often be a cost savings to the policyholder, as seen below.

Next we examine a post-FIRM property in a VE zone. Rates for these properties vary with the replacement cost ratio—how much coverage is purchased compared with the value of the structure. The higher the RCR, the lower the premium. We assume the post-FIRM VE zone property is elevated (if it is not, the owner must submit for a special rate).

Table 7 shows annual premiums for sample policies. Note that while the table shows a range of elevations—which is a primary driver of rates—we do not have data on the actual range of property elevations. As with the AE zone, there should be very few properties post-FIRM below BFE that are not eligible for grandfathering.

For reference, in 2014, for single-family homes nationwide, the average coverage in the VE zone was roughly $200,000 (slightly higher in New Jersey, with a median of $250,000) and 68 percent had a RCR at or above 0.75 (in New Jersey it is roughly 50 percent of single-family polices). It is clear from Table 7 that VE zone rates are substantially higher than AE zone rates, given the risk of wave action. Elevation also again drives premiums, with properties above BFE paying substantially less. It is not shown in the table, but rates drop even further above +2 above BFE. For properties at or below BFE in the V zone, annual premiums can range from a few thousand dollars to over $10,000. Note again, however, that even in oceanfront communities, the V zone is very small geographically, and so there are not many VE zone policies in force nationwide, or in New Jersey (see Section 3). Much of the SFHA in coastal areas is designated as AE zone.

Pre-FIRM rates in the VE zone can provide savings to some properties, particularly those at or below BFE. Since the lower pre-FIRM rate is on the first $60,000 of coverage, the savings are greatest for those purchasing lower amounts of coverage. Pre-FIRM rates, as seen in Table 8, can still be high in the VE zone for coverage near the cap; if these properties are above BFE, post-FIRM rates may be preferable. Again, pre-FIRM rates are now being phased out annually.

[11] The pre-FIRM SRL rates are used regardless of whether a property is a non-primary residence or substantially improved. The substantially improved rates are used for non-SRL, primary residences that were substantially improved on or after April 15, 2015.

TABLE 5. ANNUAL PREMIUM FOR POST-FIRM HOUSE IN AN A ZONE (AE OR A1-A30*)

		Elevation: +2 feet		*Elevation: At BFE*		*Elevation: –2 feet*	
Deductible	***Property***	***$100,000 coverage***	***$250,000 coverage***	***$100,000 coverage***	***$250,000 coverage***	***$100,000 coverage***	***$250,000 coverage***
Minimum** deductible	1 floor, no basement	$446	$593	$1,573	$1,890	$4,919	$6,347
	More than 1 floor, no basement	$380	$510	$1,196	$1,348	$3,256	$3,842
	More than 1 floor, with basement	$338	$469	$587	$714	$1,453	$1,575
$3,000 deductible	1 floor, no basement	$404	$541	$1,402	$1,706	$4,367	$5,713
	More than 1 floor, no basement	$345	$466	$1,067	$1,219	$2,895	$3,463
	More than 1 floor, with basement	$308	$429	$528	$650	$1,299	$1,425

* Flood zones are defined in Appendix A. AE refers to zones where the base flood elevations have been determined and are replacing numbered A zones in all new maps.

** For building coverage of $100,000 or less, the minimum deductible is $1,000. For more than $100,000 in building coverage, the minimum deductible is $1,250.

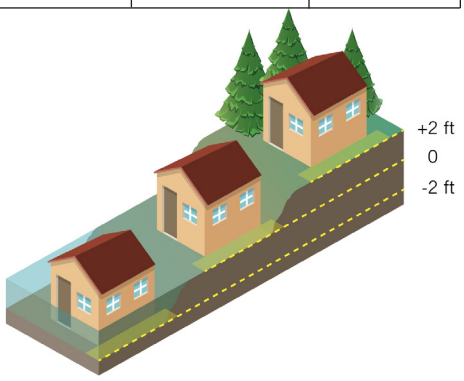


TABLE 6. ANNUAL PREMIUM FOR PRE-FIRM HOUSE IN AN A ZONE (A, AE, A1-A30, AO, AH*)

		Primary residence		*Non-primary residence*		*Severe repetitive loss*		*Substantially improved*	
Deductible	***Property***	***$100,000 coverage***	***$250,000 coverage***	***$100,000 coverage***	***$250,000 coverage***	***$100,000 coverage***	***$250,000 coverage***	***$100,000 coverage***	***$250,000 coverage***
Minimum* deductible	No basement	$1,237	$2,644	$2,212	$4,540	$1,708	$3,891	$1,555	$3,399
	With basement	$1,476	$3,581	$2,615	$6,065	$2,067	$5,322	$1,866	$4,612
$3,000 deductible	No basement	$1,138	$2,506	$2,046	$4,310	$1,567	$3,685	$1,427	$3,219
	With basement	$1,355	$3,392	$2,410	$5,751	$1,892	$5,037	$1,709	$4,366

*Flood zones are defined in Appendix A.

**For building coverage of $100,000 or less, the minimum deductible is $1,500. For more than $100,000 in building coverage, the minimum deductible is $2,000.

TABLE 7. ANNUAL PREMIUM FOR POST-FIRM HOUSE IN A V ZONE (POST-1981, VE, V1-V30*)

		Elevation: +2 feet		*Elevation: At BFE*		*Elevation: –2 feet*	
Deductible	***Property***	***$100,000 coverage***	***$250,000 coverage***	***$100,000 coverage***	***$250,000 coverage***	***$100,000 coverage***	***$250,000 coverage***
Minimum** deductible	No obstruction RCR*** .5 – .74	$2,476	$5,952	$3,948	$9,576	$5,558	$13,542
	No obstruction, RCR > .75	$1,982	$4,735	$3,327	$8,048	$4,822	$11,729
$3,000 deductible	With obstruction, RCR .5 – .74	$3,261	$8,003	$4,431	$10,929	$6,019	$14,899
	With obstruction, RCR > .75	$2,599	$6,349	3,516	$8,639	$5,113	$12,634
	No obstruction, RCR >0.75	$1,759	$4,263	$2,950	$7,240	$4,273	$10,547

*Flood zones are defined in Appendix A.
**For building coverage of $100,000 or less, the minimum deductible is $1,000. For more than $100,000 in building coverage, the minimum deductible is $1,250.
***RCR: replacement cost ratio (amount of coverage purchased divided by replacement cost of building).

TABLE 8. ANNUAL PREMIUM FOR PRE-FIRM HOUSE IN A V ZONE (V, VE, V1-V30*)

		Primary residence		*Non-primary residence*		*Severe repetitive loss*		*Substantially improved*	
Deductible	***Property***	***$100,000 coverage***	***$250,000 coverage***	***$100,000 coverage***	***$250,000 coverage***	***$100,000 coverage***	***$250,000 coverage***	***$100,000 coverage***	***$250,000 coverage***
Minimum* deductible	No basement	$2,065	$5,700	$3,614	$9,700	$2,928	$8,479	$2,617	$7,318
	With basement	$2,627	$8,034	$4,569	$13,671	$3,784	$12,080	$3,354	$10,372
$3,000 deductible	No basement	$1,890	$5,394	$3,319	$9,186	$2,675	$8,020	$2,392	$6,923
	With basement	$2,400	$7,599	$4,186	$12,940	$3,453	$11,423	$3,062	$9,810

*Flood zones are defined in Appendix A.
**For building coverage of $100,000 or less, the minimum deductible is $1,500. For more than $100,000 in building coverage, the minimum deductible is $2,000.

Finally, we turn to properties outside the SFHA, where there are no pre-FIRM rates. X zone rates vary by type of basement, as shown in Table 9. They are not elevation rated and thus not "risk-based." Note that X zone rates—like all other policies—are subject to the reserve fund assessment of 15 percent as well as the $25 surcharge for primary residences.

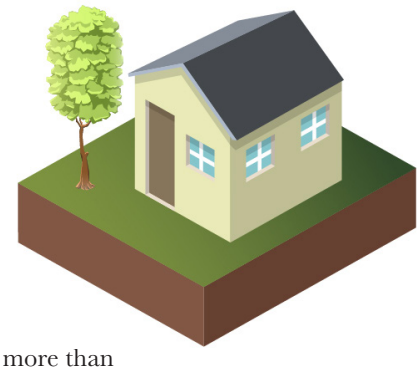
Rates for the hypothetical examples in the table range from around $750 to almost $1,800. Since they are not elevation rated, they can be higher than the AE zone for properties above BFE. This may discourage purchase of flood insurance for elevated homes outside the SFHA, unless they qualify for a PRP rate.

The PRP premium is for properties with a favorable loss history, as described above. It is offered only in set combinations of building and contents coverage (or contents only) and varies by presence of a basement or enclosure. A few examples are shown in Table 10. Properties must be located in a B, C, or X zone and meet the loss criteria. There is no long-term grandfathering of this rate. If a new map moves a property into an SFHA, the policy-holder is transitioned overtime to an X zone rate. For building coverage up to $100,000, the deductible is $1,000 for both building and con-tents coverage; over $100,000, the deductible is $1,250.

The above calculations can serve as general indications of NFIP premiums for New Jersey homeowners. They are not the actual distribution of premiums in the program. They should also not be taken as estimates for individual properties; for any specific property, an agent should be contacted for an accurate premium quote.

TABLE 9. ANNUAL PREMIUM FOR POST-FIRM HOUSE IN AN X ZONE*

Deductible	***Property***	***$100,000 coverage***	***$250,000 coverage***
Minimum* deductible	No basement or enclosure	$939	$1,417
	With basement	$1,084	$1,764
$5,000 deductible	No basement or enclosure	$755	$1,146
	With basement	$869	$1,422



*Flood zones are defined in Appendix A.
**For building coverage of $100,000 or less, the minimum deductible is $1,000. For more than $100,000 in building coverage, the minimum deductible is $1,250.

TABLE 10. ANNUAL PREMIUM FOR A PRP QUALIFYING PROPERTY

	$50,000 building, $20,000 contents	$100,000 building, $40,000 contents	$250,000 building, $100,000 contents
Basement	$302	$385	$499
No basement	$272	$349	$450

5.2. Rate Comparisons and Projections

As discussed in Section 4, there are two primary groups of policyholders that receive lower rates: pre-FIRM properties and grandfathered properties. For reference, this section will first provide some indication, for an example pre-FIRM property, of the savings (or cost) of using pre-FIRM rates and an indication of the increase in rates these policyholders may see in the future, and then examine the savings that a homeowner receives from grandfathering.

Properties in the SFHA that are at or above BFE will generally do better with post-FIRM rates, which are elevation rated, than with pre-FIRM rates, which are not. At the current time, the burden is on households to obtain an elevation certificate, but once done, this can result in lower annual premiums for these households. (Households can get an elevation certificate and if it shows a savings from pre-FIRM rates, continue with pre-FIRM pricing.) For example, a single-family residence in an AE zone with 1 floor and no basement choosing $250,000 of coverage and the minimum deductible would save over $2,000 annually by switching to a post-FIRM rate if they were +2 above BFE. Savings amounts will be greater for homes raised a greater amount above BFE. They will also vary according to the coverage level chosen and type of structure. For example, a property in an AE zone with only $100,000 of building coverage, with the minimum deductible, more than one story, and with a basement that is at BFE would save $889 annually by switching to post-FIRM rates. This all said, we have no data on the number of pre-FIRM homes that might actually be above BFE.

Properties below BFE, however, currently receive cost savings from pre-FIRM rates. Focusing here on primary residences, we consider a single-family home in an AE zone that has one floor, no basement, $250,000 of building coverage, and the minimum deductible. (In 2014, over half of single-family policies nationwide purchased $250,000 of coverage.) If the home is below BFE, the pre-FIRM rate provides savings of thousands of dollars every year: $7,599 at -4 and $3,683 at -2. At BFE, however, post-FIRM rates are lower, and thus, there is a cost to using pre-FIRM rates, which becomes greater as the property is raised above BFE. At +4 above BFE, pre-FIRM rates are $2,195 greater than post-FIRM rates. This general pattern of the benefits of pre-FIRM rating falling with elevation holds for other types of properties and policy choices.

As discussed in Section 4, pre-FIRM rates are being slowly eliminated. This will impose costs on properties below BFE that are currently receiving this discount. Every year, rates on residential, pre-FIRM properties will be increasing between 5 percent and 18 percent. For our example property that is two feet below BFE, this will bring their premium to a post-FIRM premium in 8 years if the increase is 18 percent a year, the maximum property-level increase allowed under current legislation (and assuming post-FIRM rates grow at constant 3 percent a year[12]). When the post-FIRM rates becomes preferable, the property owner should provide the needed elevation data to FEMA for post-FIRM rating. At an annual increase of only 5 percent a year (the minimum increase required), however, pre-FIRM rates still will not have reached a post-FIRM rate in two decades. Thus the impact on the homeowner of losing the pre-FIRM rate will depend substantially on how much FEMA raises these rates each year. For primary residences, FEMA increased pre-FIRM rates by 15 percent in 2015 and by 5 percent in 2016.[13] Note that for non-primary residences, businesses, severe repetitive loss properties, cumulative loss properties, and those substantially damaged or improved, FEMA must increase rates at 25 percent a year, leading to a much faster elimination of pre-FIRM rates for these properties.

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[12] This was the assumption made in a presentation by Andy Neal of FEMA to the 2016 Association of State Floodplain Managers Conference.

[13] See: www.adeca.alabama.gov/Divisions/owr/floodplain/Documents/w-14053_NFIP-Program-Changes_04-01-2015.pdf and nfipiservice.com/Stakeholder/FEMA7/ATTACHMENT%20A%20-%20Summary%20of%20the%20NFIP%20April%202016%20Program%20Changes%20final.pdf

Turning now to grandfathering, there are two important points about the savings (or costs) that zone grandfathering can provide to households newly mapped into higher risk areas. First, if a property is below the new BFE, the financial savings from grandfathering can be substantial. That said, for homes above BFE, it may be cheaper to use the full risk rates of the new flood zone and not the X zone rate possible with grandfathering. This is because X zones rates are not based on elevation; for homes above BFE, therefore, it may be better to use the SFHA rate that accounts for elevation. Note that when newly mapped, properties will first be given a PRP rate (with a higher Reserve Fund Assessment and Federal Policy Fee), which will then be increased annually until the X zone is reached. We are simply comparing the full X zone premium to the AE zone premium. The PRP will be lower and thus make grandfathering more favorable.

A comparison of zone grandfathering can be seen in Table 11 which compares a full risk AE zone rate to a grandfathered X zone rate. As can be seen for the two different example homes in the table, grandfathering only provides savings when the home is below BFE. This can be a substantial savings for such a property, as seen for the 1 story home without a basement. For this home at -4, grandfathering saves $8,399 annually. When a home is above BFE, the X zone rate may actually be costlier than being rated at the full risk AE zone rate. If the same home was 4 feet above BFE, grandfathering would cost $919 annually. These properties would do better opting out of grandfathering. Note that these patterns of savings/costs from zone grandfathering are roughly the same for lower coverage levels, as well.

For elevation grandfathering, however, the grandfathered rates will always be preferable to the insured. The savings from this type of grandfathering can be seen by simply comparing the rates of a home at different elevations in Table 5 or Table 7. As another example, consider a single-family home in the AE zone with one floor and no basement currently at BFE with $250,000 of building coverage and a $1,250 deductible. This home would pay $1,890 annually. If a new BFE drops the home to -4, the rate without grandfathering would skyrocket to $10,263. In this case, grandfathering saves them over $8,000 annually. FEMA does not currently have data on the number of properties paying either type of grandfathered rate nor do they provide summary data on how BFEs have been changing on average around the country with new maps.

TABLE 11. SAVINGS FROM ZONE GRANDFATHERING

Property	*Building coverage/ deductible*	*Elevation*	*X zone (grandfathered) premium*	*AE zone (full risk) premium*	*Savings from grandfathering*
2 stories, basement	$250,000/ $2,000	-4	$1,678	$2,675	$997
		0	$1,678	$682	- $996
		+4	$1,678	$398	- $1,280
1 story, no basement	$250,000/ $2,000	-4	$1,349	$9,748	$8,399
		0	$1,349	$1,798	$449
		+4	$1,349	$430	- $919

Note: These rates do not include any CRS discount. They do include the ICC coverage premium, the 15% reserve fund assessment, the $25 HFIAA surcharge, and the $50 federal policy fee.

6. CONCLUSION

This report provides a snapshot of the NFIP in New Jersey as of mid-2016. The NFIP plays an important role in offering financial protection against flood events to New Jersey residents. New Jersey has the 4th highest number of policies in force in the country and has received over $6.1 billion (2015 USD) in claims payments since 1978. Due to the extreme nature of Superstorm Sandy, 65 percent of these claims were in 2012. This report discusses pricing in the NFIP in detail, focusing on the current policyholders that are receiving discounted rates and where those rates may go in the future. Currently, homes that are elevated above the base flood elevation receive much lower rates. Properties outside of 100-year floodplains, however, are not rated based on elevation, which at times can make premiums in this area higher than in riskier areas but where properties are elevated. Pre-FIRM discounts will be slowly removed from the program. This will substantially increase premiums for older homes below the BFE. Grandfathering currently provides premium protection for households that are newly mapped into higher risk areas. If this were to be eliminated, however, premiums could increase for homes that face a change in flood zone or BFE. The NFIP is up for renewal in 2017 and it remains to be seen whether Congress will adopt any substantial changes.

APPENDIX A. FLOOD ZONE DEFINITIONS

The following table provides descriptions of the flood zones depicted on FEMA Flood Insurance Rate Maps. The descriptions are taken from the FEMA website,[14] as well as CoreLogic [23]. Areas subject to the mandatory purchase requirement are shaded in light gray.

TABLE A1. FEMA FLOOD ZONES

Flood zone	*Description*
A	Areas subject to inundation by flood with 1% or greater annual chance of occurrence but for which no detailed hydraulic analyses have been done. These zones thus do not show base flood elevations.
AE, A1-A30	Areas subject to inundation by flood with 1% or greater annual chance of occurrence. BFEs are shown. Note: Numbered A zones are being replaced with zone AE on new FIRMs.
AH	Areas subject to inundation by shallow flood with 1% or greater annual chance of occurrence. Flooding in this zone is usually from sheet flow, with average depths of 1 to 3 feet. BFEs are shown.
AO	Areas subject to inundation by shallow flood with 1% or greater annual chance of occurrence. Flooding in this zone is usually from sheet flow, with average depths of 1 to 3 feet. BFEs are shown.
AR	Areas subject to inundation by flood with 1% or greater annual chance of occurrence because of temporarily increased flood risk caused by ongoing restoration of flood protection system.
A99	Areas subject to inundation by flood with 1% or greater annual chance of occurrence but that will ultimately be protected by federal flood protection system that has made enough progress to be considered complete for insurance rating purposes. BFEs are not given.
V	Coastal areas subject to inundation by flood with 1% or greater annual chance of occurrence and subject to storm-induced waves. No detailed hydraulic analyses have been done and so these zones do not show BFEs.
VE, V1-V30	Coastal areas subject to inundation by flood with 1% or greater annual chance of occurrence and subject to storm-induced waves. BFEs are shown. Note: Numbered V zones are being replaced with zone VE on new FIRMs.
D	Areas with possible but undetermined flood risk.
X (shaded), B	Areas of moderate flood hazard between limits of 100-year and 500-year floodplain. Note: zone B is being replaced with shaded zone X on new FIRMs.
X (unshaded), C	Areas of minimal flood hazards outside 500-year floodplain. Note: zone C is being replaced with unshaded zone X on new FIRMs.

[14] Retrieved May 12, 2016, from http://www.fema.gov/flood-zones

APPENDIX B. DETAILED PREMIUM CALCULATIONS

This appendix presents detailed premium calculations for three example properties to illustrate the components of NFIP annual premiums. A few notes on the following calcula-tions are in order.

Deductibles. Premium rates vary based on the deductible a policyholder chooses. Premiums are discounted for higher deductibles. The minimum deductible a policyholder may choose depends on the level of coverage and whether the property is rated for full-risk or is pre-FIRM. The minimum deductible for a post-FIRM single-family, building-only policy is $1,000 for coverage of $100,000 or less, and $1,250 for coverage over $100,000. The minimum deductible for pre-FIRM properties is $1,500 for coverage under $100,000, and $2,000 for coverage over $100,000.

Basic and additional coverage. For single-family dwellings, the basic insurance limit is $60,000 and the policyholder is charged a certain rate per $100 of coverage. The additional insurance limit is $190,000 and this coverage is charged a lower rate. The total insurance limit is $250,000. For example, a policyholder who chooses to purchase $100,000 worth of building coverage is charged one rate per $100 of coverage for the first $60,000 of coverage and a different rate for the remaining $40,000 [see: 20, RATE 1]

Reserve fund assessment. The reserve fund assessment is applied to all policies except group flood insurance policies. Its purpose is to build up a reserve fund to help cover costs when claims are greater than the annual pre-mium that NFIP collects. As of April 2016, the rate is 15 percent for all policies.

HFIAA surcharge. The Homeowner Flood Insurance Affordability Act of 2014 added an annual surcharge for all new and renewal policies. It aims to offset the slowdown in the phasing out of discounted rates. The surcharge is $25 for primary residences and $250 all oth-er policies.

Federal policy fee. The federal policy fee is a flat charge that policyholders are required to pay on each new or renewal policy to offset certain administrative expenses incurred by the NFIP. For PRP, the fee is $25. For all other policies, it is $50.

Example Property 1: Regular program, post-FIRM, $1,000 deductible, zone AE or A1-A30, primary residence, building-only policy, $100,000 building coverage, 0 feet above BFE

Regular Program

- Flood zone: AE or A1-A30
- Occupancy: Single-family
- Number of floors: 1
- Basement/enclosure: None
- Deductible: $1,000
- Deductible factor: 1.00
- Date of construction: Post-FIRM
- Elevation difference: 0
- Building coverage: $100,000
- Building rates: 2.03/.2
- ICC premium: $5
- CRS rating: N/A
- CRS discount: N/A
- Reserve fund assessment: 15%
- Probation surcharge: $0
- HFIAA surcharge: $25
- Federal policy fee: $50

	Total Coverage	***Basic Limits***			***Additional Limits***				
		Coverage	***Rate***	***Annual premium***	***Coverage***	***Rate***	***Annual premium***	***Deductible factor***	***Total***
Building	$100,000	$60,000	2.03	$1,218	$40,000	.20	$80	$0	$1,298
Contents	0	-	-	-	-		-		
								Annual subtotal	$1,298
Rates for basic/additional building coverage range from 0.68/0.08 (more than one floor, with a basement) to 2.03/0.20 (1 story, no basement).								ICC premium	$5
								CRS discount	$0
								Reserve fund (15%)	$195
								Probation surcharge	$0
								HFIAA surcharge	$25
								Federal policy fee	$50
								Total amount due	$1,573

Premium Calculation

1)	Multiply rate x $100 of coverage:	Basic:	2.03 x ($60,000/ $100) = $1,218
		Additional:	.20 x ($40,000/ $100) = $80
		Subtotal:	$1,298
2)	Apply deductible factor:		1.00 x $1,298 = $1,298
3)	Annual subtotal:		$1,298
4)	Add ICC premium:		$5
5)	Subtotal:		$1,303
6)	Subtract CRS discount:		N/A
7)	Subtotal:		$1,303
8)	Add Reserve fund assessment:		.15 x $1,303 = $195
9)	Subtotal:		$1,498
10)	Add probation surcharge:		$0
11)	Add HFIAA surcharge:		$25
12)	Add federal policy fee:		$50
13)	**Total amount due:**		**$1,573**

Example Property 2: Regular program, post-FIRM, post-1981, $1,250 deductible, zone VE or V1-30, primary residence, building-only policy, $250,000 building coverage, 0 feet above BFE

Regular Program

- Flood zone: VE or V1-V30
- Occupancy: Single-family
- Number of floors: N/A
- Basement/enclosure: None
- Deductible: $1,250
- Deductible factor: 0.985
- Date of construction: Post-FIRM/Post-1981
- Elevation difference: 0
- Building coverage: $250,000
- Building rate: 3.35
- Replacement cost ratio: 0.5-0.74
- ICC premium: $13
- CRS rating: N/A
- CRS discount: N/A
- Reserve fund assessment: 15%
- Probation surcharge: $0
- HFIAA surcharge: $25
- Federal policy fee: $50

	Total Coverage	***Basic Limits***			***Additional Limits***				
		Coverage	***Rate***	***Annual premium***	***Coverage***	***Rate***	***Annual premium***	***Deductible factor***	***Total***
Building	$250,000	$60,000	3.35	$2,010	$190,000	3.35	$6,365	0.985* ($2,010+$6,365)	$8,249
Contents	0	-	-	-	-		-		-
Rates for building coverage range from 2.81 (no obstruction, RCR = 0.75 or more) to 5.84 (with obstruction, RCR under 0.5).								Annual subtotal	$8,249
								ICC premium	$13
								CRS discount	$0
								Reserve fund (15%)	$1,239
								Probation surcharge	$0
								HFIAA surcharge	$25
								Federal policy fee	$50
								Total amount due	$9,576

Premium Calculation

1)	Multiply rate x $100 of coverage:	Basic:	3.35 x ($60,000/ $100) = $2,010
		Additional:	3.35 x ($190,000/ $100) = $6,365
2)	Apply deductible factor:		.985 x $8,375 = $8,249
3)	Annual subtotal:		$8,249
4)	Add ICC premium:		$13
5)	Subtotal:		$8,262
6)	Subtract CRS discount:		N/A
7)	Subtotal:		$8,262
8)	Add Reserve fund assessment:		.15 x $8,262 = $1,239
9)	Subtotal:		$9,501
10)	Add probation surcharge:		$0
11)	Add HFIAA surcharge:		$25
12)	Add federal policy fee:		$50
13)	**Total amount due:**		**$9,576**

Example Property 3: Regular program, post-FIRM, $1,000 deductible option, zone X, primary residence, building-only policy, $100,000 building coverage

Regular Program

- Flood zone: X
- Occupancy: Single-family
- Number of floors: N/A
- Basement/enclosure: None
- Deductible: $1,000
- Deductible factor: 1.0
- Date of construction: Post-FIRM
- Elevation difference: N/A
- Building coverage: $100,000
- Building rates: 1.05/0.29
- Replacement cost ratio: 0.5-0.74
- ICC premium: $5
- CRS rating: N/A
- CRS discount: N/A
- Reserve fund assessment: 15%
- Probation surcharge: $0
- HFIAA surcharge: $25
- Federal policy fee: $50

	Total Coverage	***Basic Limits***			***Additional Limits***				
		Coverage	***Rate***	***Annual premium***	***Coverage***	***Rate***	***Annual premium***	***Deductible factor***	***Total***
Building	$100,000	$60,000	1.05	$630	$40,000	.29	$116	$0	$746
Contents	0	-	-	-	-		-		
								Annual subtotal	$746
Rates for basic/additional building coverage range from 0.68/0.08 (more than one floor, with a basement) to 2.03/0.20 (1 story, no basement).								ICC premium	$5
								CRS discount	$0
								Reserve fund (15%)	$113
								Probation surcharge	$0
								HFIAA surcharge	$25
								Federal policy fee	$50
								Total amount due	$939

Premium Calculation

1)	Multiply rate x $100 of coverage:	Basic:	1.05 x ($60,000/ $100) = $630
		Additional:	.29 x ($40,000/ $100) = $116
2)	Apply deductible factor:		1.00 x $746 = $746
3)	Annual subtotal:		$746
4)	Add ICC premium:		$5
5)	Subtotal:		$751
6)	Subtract CRS discount:		N/A
7)	Subtotal:		$751
8)	Add Reserve fund assessment:		.15 x $751 = $113
9)	Subtotal:		$864
10)	Add probation surcharge:		$0
11)	Add HFIAA surcharge:		$25
12)	Add federal policy fee:		$50
13)	**Total amount due:**		**$939**

APPENDIX C. ABBREVIATIONS

BFE	base flood elevation (estimated height of water in a 100-year flood)
BW12	Biggert-Waters Flood Insurance Reform Act of 2012
CRS	Community Rating System (a program that discounts premiums for property owners in communities that reduce risks of flooding)
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FY	Fiscal year
GAO	Government Accountability Office
HFIAA14	Homeowner Flood Insurance Affordability Act of 2014
NFIP	National Flood Insurance Program
Pre-FIRM	A property built before a community's flood risk was mapped
PRP	Preferred Risk Policy (a policy with a lower rate for a property with a favorable loss history)
RCR	Replacement cost ratio (amount of coverage divided by replacement cost of the building)
RL	Repetitive loss
SFHA	Special Flood Hazard Area
SRL	Severe repetitive loss
WYO	Write-your-own (a company that writes policies on behalf of NFIP)

REFERENCES

1. T.L. Hayes and D.A. Neal, "Actuarial Rate Review: In Support of the Recommended October 1, 2011, Rate and Rule Changes" (Washington, DC: Federal Emergency Management Agency, 2011).

2. Swiss Re, "Innovating to Insure the Uninsurable," in Sigma (Zurich: Swiss Reinsurance Company, 2005).

3. C. Kousky, "Revised Risk Assessments and the Insurance Industry," in Policy Shock: Regulatory Responses to Oil Spills, Nuclear Accidents, and Financial Crashes, E. Balleisen et al. (eds.) (Cambridge University Press, forthcoming).

4. C. Kousky and R. Cooke, "Explaining the Failure to Insure Catastrophic Risks," Geneva Papers 37 (2012): 206–27.

5. D.A. Grossman, "Flood Insurance: Can a Feasible Program Be Created?" Land Economics 34(4) (1958): 352–57.

6. FEMA, "Managing Floodplain Development through the National Flood Insurance Program," in Home Study Course (Washington, DC: Federal Emergency Management Agency, 1998).

7. GAO, "Opportunities Exist to Improve Oversight of the WYO Program" (Washington, DC: US Government Accountability Office, 2009).

8. L. Dixon et al., "The National Flood Insurance Program's Market Penetration Rate: Estimates and Policy Implications" (Santa Monica, CA: RAND Corporation, 2006).

9. C. Kousky and E. Michel-Kerjan, "Superstorm Sandy, Storm Surge, and the National Flood Insurance Program: A Primer on New York and New Jersey," RFF Issue Brief 12-08 (Washington, DC: Resources for the Future, 2012).

10. GAO, "Actions to Address Repetitive Loss Properties," Testimony of William O. Jenkins Jr., Director, Homeland Security & Justice Issues (Washington, DC: US Senate, Subcommittee on Economics Policy, Committee on Banking, Housing, and Urban Affairs, 2004).

11. FEMA, "Hazard Mitigation Assistance Unified Guidance" (Washington, DC: Department of Homeland Security. Federal Emergency Management Agency, 2013).

12. FEMA, "Community Rating System Fact Sheet" (Washington, DC: Federal Emergency Management Agency, Federal Insurance and Mitigation Administration, 2014).

13. C. Kousky and L. Shabman, "Pricing Flood Insurance: How and Why the NFIP Differs from a Private Insurance Company," RFF Discussion Paper 14-37 (Washington, DC: Resources for the Future, 2014).

14. GAO, "Flood Insurance: FEMA's Rate-Setting Process Warrants Attention" (Washington, DC: US Government Accountability Office, 2008).

15. FEMA, "National Flood Insruance Program: Report to Congress on Reinsuring NFIP Insurance Risk and Options for Privatizing the NFIP" (Washington, DC: Federal Emergency Management Agency, 2015).

16. D. Garcia-Diaz, Testimony to the Subcommittee on Housing and Insurance, Committee on Financial Services, House of Representatives (Washington, DC: US Government Accountability Office, 2014).

17. C. Kousky and E. Michel-Kerjan, "Examining Flood Insurance Claims in the United States," Journal of Risk and Insurance, 2015, DOI: 10.1111/jori.12106.

18. GAO, "Continued Actions Needed to Address Financial and Operational Issues," in Testimony of Orice Williams Brown, Director of Financial Markets and Community Investment, before the Subcommittee on Housing and Community Opportunity, Committee on Financial Services, House of Representatives (Washington, DC: US Government Accountability Office, 2010).

19. GAO, "Flood Insurance: More Information Needed on Subsidized Properties" (Washington, DC: US Government Accountability Office, 2013).

20. FEMA, National Flood Insurance Program Flood Insurance Manual (Washington, DC: US Department of Homeland Security, Federal Emergency Management Agency, 2016).

21. FEMA, National Flood Insurance Program Specific Rating Guidelines (Washington, DC: US Department of Homeland Security, Federal Emergency Management Agency , 2016).

22. North Carolina Floodplain Mapping Program, National Flood Insurance Program Premiums in North Carolina: Case Study on Data Availability, Modeling and Analysis Sup-porting Premium and Affordability Discussions (Raleigh, NC: North Carolina Floodplain Mapping Program, North Carolina Emergency Management, 2015).

23. Kousky, C. and H. Kunreuther, "Addressing Affordability in the National Flood Insurance Program," Journal of Extreme Events, 1(1) 2014.

24. CoreLogic, "Definitions of FEMA Flood Zone Designations" (Irvine, CA, 2010).