Chapter 5 NFIP'S Modeling Process

As we've noted before, the NFIP's inability to manage information effectively raises many questions about it operations. Specifically: Its method for setting its full-risk rates may not ensure that the rates accurately reflect the actual risk of flood damage.

The NFIP model combines estimated flood risk with expected flood damage, but a number of factors may affect the accuracy of the rates the model generates. These factors include:

1.some data inputs are outdated or inaccurate. FEMA relies on flood probabilities from the 1980s and damage estimates that do not fully reflect recent NFIP damage experience. While FEMA has made updating its flood maps a priority, most of the maps used in rate setting have not yet been updated;
2.FEMA does not require all properties remapped into higher-risk areas to pay rates based on the new designation. This policy, known as grandfathering, erodes NFIP's ability to charge rates that reflect the risk of flooding. The policy is intended to increase participation, but FEMA does not track the number of grandfathered properties and cannot determine their financial impact on the program;
3.FEMA uses a nationwide rating system that combines flood zones across many geographic areas, so individual policies do not always reflect topographical features that affect flood risk. In fact, some patterns in historical claims and premium data suggest that NFIP's full-risk rates may not always reflect actual flood risk.

The questions raised by these problems add to concerns about the NFIP's overall financial stability.

A related issue: the NFIP's rate-setting process for subsidized properties depends in part on the accuracy of the full-risk rates-so, if the full-risk rates are wrong, the subsidized rates are likely wrong, too.

To set its subsidized rates, the NFIP first subtracts the total amount it expects to collect in full-risk premiums from the average historical loss year - that is, the minimum (target) amount that the program needs to collect from all premiums to cover at least average annual losses, as determined by historical data. The remainder becomes the aggregate target amount the program must collect in subsidized premiums.

To set individual subsidized rates, the NFIP then considers its knowledge of flood risk, previous rate increases for various locations and statutory limits on increases.

Still, the level of subsidized rates charged to policyholders depends, in part, on the full-risk premiums determined by FEMA. For example, if full-risk premiums are too low because they do not accurately reflect flood risk, the total amount FEMA will need to collect from subsidized policies will be higher, resulting in higher subsidized premiums.

So, it should be no surprise that for most of the past 10 years the annual amount collected by the NFIP in both full-risk and subsidized premiums is not enough to cover its operating costs, claim losses and principal and interest payments to the Treasury Department.

Uncertainty about these rates raises questions about all of the NFIP's rate-setting assumptions. For example:

•For a given property type, the rate per $100 of insurance on the first $50,000 of coverage for a single-family structure in the Regular Program (that is, what NFIP terms "basic" coverage) is $1.31. The rate per $100 of insurance on amounts in excess of $50,000 (that is, what NFIP terms "additional" coverage) is $0.10. But the agency has no idea whether these standard rates are valid.

- •Standard rates are refined by multiplying them by factors - which range between 0.75 and 1.50 - designed to reflect specific risks related to a property's location, construction details and history.
- •The "one percent annual chance flood," also known as the "100-year flood," is a statistical construct essential to NFIP rates: It is the baseline risk - a flood that has a certain discharge that produces a specific flood elevation and an estimated one percent chance of occurrence in any one year. But no one is sure that the elevations are even close to right.
- •As a result, the one percent flood represents a range of discharge and elevation values because of the uncertainties and other limitations in the information available for its computation and the resulting need to use specific types of probability distributions to portray the possibilities.
- •So, the SFHA flood zones on the FIRMs can reflect varying degrees of analysis, in some cases using approximate methods while in others using more detailed methods. The accuracy of the flood hazard data depicted on the FIRMs and the delineation of the SFHA are dependent on the data limitations of the computation of the one percent flood and the topographic information available for the area being mapped.

The uncertainties involved in generating flood maps render these maps less definitive and authoritative than communities frequently assume them to be - for example, many interpret the one percent flood line as an assurance that development above that elevation or outside that line is guaranteed to be safe from the one percent flood.

In the high-risk and high-risk coastal zones, the NFIP's model combines estimates of the frequency of flooding with estimates of the magnitude of damage caused by flooding, producing "pure premium" costs intended to cover the actual flood losses.

FEMA then uses factors like the elevation of the lowest floor of the building, the type of building, the number of floors, the presence of a basement, claims data and mapping information to generate loss estimates. The pure premium amount is then adjusted to capture certain program costs, compensate for underinsurance by policyholders and reflect the fact that the program has a deductible.

Property owners are underinsured when they purchase insurance coverage for less than the value of the property, either by or because of limits on the amount of available coverage. To compensate for this possibility, FEMA increases premium rates by an "underinsurance factor" that is based on claims data going back to 1978 for different zones and types of structures. More recent experience is given a greater weight in determining the factors.

FEMA has taken this approach for pricing in high-risk flood zones because it believes the cost of obtaining the information necessary to develop detailed frequency-magnitude relationships for use in a hydrologic model would be extremely high in relation to the benefits.

For the moderate-to low-risk and other full-risk premium zones, rates have been developed based on actuarial and engineering judgments, using the rates generated by the model and the historical experience of the high-risk zones as benchmarks.

The two types of policies in the moderate- to low-risk zones are referred to as "preferred risk" and "standard" policy. The preferred risk policyholders generally pay the lowest flood rates. Preferred risk policies are available on buildings that are outside of the SFHA and have not flooded more than once.

Questions remain about the age and quality of the underlying data FEMA uses in its model to calculate full-risk premiums. The NFIP model for setting full-risk premium rates relies on flood probability estimates and expected damage data, which rely in part on outdated or potentially inaccurate information, including outdated FIRMs.

For other lines of catastrophe insurance, private insurers rely heavily on computer models of simulated damage over many possible events to price their products. But the NFIP - as well as other federal agencies and private insurers involved in flood modeling - rely instead on flood maps and proprietary data on the likelihood of flooding and damages.

And the premises underlying those maps and data may be wrong.

Waves and Flood-Proofing Affect NFIP Ratings

An agent/producer must determine whether or not the BFE on the FIRM includes wave height. With very few exceptions - mostly involving communities on the West Coast - the FIRMs published prior to January 1981 give still water levels that do not include wave height. (FIRMs published in January 1981 and later indicate whether or not wave height is included.)

If wave height is included, the following statement appears on the map legend: "Coastal base flood elevations shown on this map include the effects of wave action."

The additional elevation due to wave crest in V-Zone areas will normally vary from a minimum of 2.1 feet to 0.55 times the still water depth at the site. (BFE including wave height adjustment = still water BFE + 0.55 - [still water BFE - lowest adjacent grade elevation].)

For example, a building's site is determined to be located in Zone V8 with a BFE of 14' NGVD on the appropriate FIRM. Using the information from the Elevation Certificate, the BFE is calculated as follows:

Base Flood Elevation 14'

Lowest Adjacent Grade -6'

Difference 8'

Factor - 0.55

Wave height adjustment (2.1' minimum) 4.4'

Base Flood Elevation + 14'

BFE adjusted 18.4'

When computing a premium for a flood-proofed building, use the following procedure:

1. Determine how far above the BFE the building is flood proofed (For example, the building will be flood proofed at +1 foot, +2 feet, and so forth above BFE.)
2. Subtract 1 foot to determine the elevation to be used in determining the rate and computing the premium for the building.
3. Find the rate for the given building in the proper zone at the "adjusted" elevation.
4. Compute the premium as usual.

The building must be flood proofed to +1 foot in order to receive a rate equivalent to a building with its lowest floor elevated to the BFE.

For example, if the building is located in Zone AO and the community's flood-proofing standards have been approved to a level of 3 feet above the highest adjacent grade (HAG) for the lowest floor of a non-floodproofed building, to qualify for With Certification of Compliance rates, a building must meet the following standards:

Be flood proofed to an elevation of 4 feet above HAG (1 foot above the community's minimum standard of 3 feet above HAG).

The flood-proofing must be certified by a registered professional engineer or architect on the Flood-proofing Certificate or by a responsible local official in a letter containing the same information requested on the Flood-proofing Certificate. And the certificate or letter must accompany the NFIP Flood Insurance Application.

In order to be eligible for lower rates, the insured must have a registered professional engineer or architect certify that the floodproofing conforms to the minimum floodproofing specifications of FEMA. This means that the building must be flood proofed to at least one foot above the BFE. If flood proofed to one foot above the BFE or flood depth, it can then be treated for rating purposes as having a "0" elevation difference from the BFE.

To further illustrate: If the building is certified to be flood proofed to two feet above the BFE, flood depth or comparable community-approved floodplain management standards, whichever is highest, then it is credited for floodproofing and is to be treated for rating purposes as having a +1 foot elevation.

Flood Elevations and Public Policy

FEMA's estimates of probabilities that floods of different severities (relative to the base flood elevation) will occur in a given year, or "probability of elevation" (PELV) values, were generated in the 1970s.

Within any zone, the risk that floodwaters will reach the BFE in any year is one percent, but across zones the likelihood that floodwaters will reach a foot above or below that level varies.

PELV tables provide detailed information, by zone, about the frequency with which floods of different elevations are expected to occur. These data were generated using detailed engineering studies, available flood data, simulations, and professional judgment and were established for each flood zone to meet generally accepted scientific parameters and legal considerations of the time.

FEMA later concluded that flood probabilities were likely underestimated in some cases because of the short flood histories used in some of the studies. As a result, according to FEMA officials, some of the original PELV values were modified in the early 1980s to account for this statistical bias. They have not been revisited or updated since that time.

FEMA currently uses both the original and modified PELV values in the rate-setting process. The original PELV values contribute 80 percent to the ultimate results and the modified values 20 percent, reflecting weights set out by policies from the early 1980s, according to FEMA officials. Flood risk experts have suggested that flood probabilities (and thus flood insurance rates) are likely to change as land use (such as urban or suburban development), infrastructure (such as new bridges and culverts), and weather patterns change. FEMA could capture such changes by updating its flood probability data but has not done so.

FEMA officials also acknowledged that the weighting for the original and modified PELV values was likely out of date but said that other competing priorities, including supporting post-Katrina-related activities and other studies had been given priority.

More troubling still: One FEMA official noted that the weighting might introduce a degree of "conservatism" to the rate-setting process because it would lead to higher rather than lower premium rates. This was just the clearest example of public policy trumping good actuarial management.

And this conflict between politics and risk management is a constant issue with the NFIP. According to FEMA officials, the geographic mix of NFIP policies had become more concentrated in Florida and other communities where the PELV values were more accurate. Nevertheless, FEMA has not updated the PELV data since the 1980s or updated the weighting of the original and modified PELV data. As a result, the accuracy of the flood probability estimates and the probability of elevation values are uncertain, and we could not determine whether the rates based on such data were accurate. Moreover, FEMA was not able to provide any analysis that it had done to determine that the current weighting remained appropriate or that the probabilities had not changed in over 30 years.

FEMA relies on estimates of the percentage of the value of a structure that is expected to be damaged when a flood occurs, or the "damage by elevation" (DELV) values. DELV information is measured in one-foot increments of the flood level within the structure and is expressed as the expected percentage of the property's value that will be damaged by a flood of that elevation.

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 Corps and available flood claims at that time.

Currently, FEMA modifies the Army Corps of Engineers DELV values based on its NFIP claims experience. When FEMA determines that its own loss data are "credible," it uses these data rather than the original data generated by the Corps.

However, FEMA also currently uses updated Corps damage data to supplement NFIP claims data where it lacks sufficient credible loss data. According to a FEMA official, for the most common type of property insured by NFIP, the claims process has become fully credible for a wide range of water depths in the structure.

By not updating the PELV data, NFIP essentially was assuming that the difference between the 10 percent annual chance of flood (that is, the 10-year flood) and the one percent annual chance of flood has not changed since the data were published in the 1970s and 1980s.

Another problem: Claims records were often incomplete because the claims data had been collected in the field by local adjustors for purposes of processing claims.

As a result, many records did not indicate BFE or depth of flooding, clearly differentiate between wind and water losses - or capture losses above the insurance limit when damage exceeded coverage limits. In addition, Corps officials reviewed FEMA's claims between 1998 and 2000 databases and found the data to be unreliable for their purposes.

For example, according to the Corps, in some cases the claims data indicated flood damage, but flood height data were missing. FEMA's database recorded these missing height data as a flood height of zero. According to FEMA officials, zero elevation water is a depth that encompasses up to the first 5 inches of floodwater in a property.

This depth is also sometimes referred to as a "carpet soaker" flood.

The GAO's analysis of NFIP claims paid between 1978 and 2007 supported what the Corps had discovered. Specifically:

We found an increasing percentage of claims with "0" water depth until they leveled off at between 44 and 49 percent from 1998 until 2004. In 2005 when the Gulf Coast hurricanes occurred, this percentage dropped to about 13 percent, but has risen above 22 percent in the more recent years. Thus, an erroneous data combination of positive flood damage and zero flood height was being used to develop damage curves. As a result, the Corps began to collect its own damage data, which FEMA now uses to supplement its own data.

FIRMs provide the information that determines base flood elevations, a key input in the rate-setting model. FEMA formally undertook map modernization efforts in fiscal year 2003. According to FEMA, the agency undertook map modernization for several reasons:

- Flood hazard conditions are dynamic, and many NFIP maps may not reflect recent development and/or natural changes in the environment.
- Updated NFIP maps can take advantage of revised data and improved technologies for identifying flood hazards.
- Up-to-date maps support a flood insurance program that is more closely aligned with actual risk, encourages wise community-based floodplain management, and improves citizens' flood hazard awareness.
- Local communities and various stakeholders want more timely updates of flood maps and easier access to the flood hazard data used to create the maps.

FEMA also revised its goal of having digitized maps that covered 100 percent of the population to having digitized maps for 92 percent of the population so that it could better focus its efforts and thus improve map quality.

According to FEMA, as of May 2008, approximately 4 percent of U.S. counties had maps that accurately reflect the current risk of flooding (fully updated) and were newly digitized and 2 percent had old maps that may or may not accurately reflect the actual risk of flooding but were

newly digitized. For the remaining 94 percent of U.S. counties, the maps were a combination of new and old mapping data that were in production or have not yet begun the process.

However, although FEMA has been working to update FIRMs and improve their quality, a significant portion of the maps reflect data at least 15 years old, which may or may not accurately reflect actual risk of flooding.

As of April 2008:

- 50 percent of the nation's approximately 105,700 flood maps were at least 15 years old,
- 58 percent were more than 10 years old and
- 70 percent were at least 5 years old.

To the extent that these older maps are inaccurate and the risk of flooding has changed, reliance on these older maps could lead to inaccurate flood risk assessments, which in turn could lead to inaccurate premium rates.

As floodplains are developed and more ground surfaces are paved or made impervious (nonabsorbent), the risks and expected elevations of flooding increase. When the predicted elevation of the base flood increases, SFHAs subsequently spread beyond mapped boundaries.

As a result, in rapidly developing watersheds or where characteristics change significantly due to flood control projects or other natural events, some FIRMs may become outdated shortly after their completion.

FEMA's current flood hazard mapping procedures for coastal areas incorporate storm-induced coastal erosion but not long-term erosion. While shorelines, dunes, and bluffs can retreat during a single storm, long-term erosion at a shoreline is the net result of a variety of factors such as sediment losses from storms and inundation from sea level rise, averaged over several decades.

In some cases flood insurance rates may send a false signal that understates the risk exposure faced by current policyholders or prospective development.

FEMA classifies properties according to flood risk using a single, nationwide class-rating system rather than an individual property or community-by-community rating system. That is, all properties grouped into a class - based on structure type and elevation relative to the BFE - are assumed to have the same risk.

Further, FEMA charges the same rate for a given class in the high-risk zone (or separately, in the high-risk coastal zone) regardless of location within the zone. Thus, two properties in the same class but located on vastly different terrain - for example, one in a shallow floodplain and the other in a steep and narrow mountain valley - are charged the same rate per $100 of insurance coverage despite the fact that they may have different expected loss.

The NFIP model can incorporate specific topographic (that is, flood zone) information in rate setting. However, according to FEMA, it was determined that more averaging could be justified, because the differences in rates across flood zones were not significant enough to warrant that level of detail.

According to FEMA officials, NFIP implemented the nationwide class-rating system because of the nature of the program and the desire to make it less complex and easier for agents and customers to understand. In the early years of the program, rates were set on a community-by-community basis. But as the number of communities participating grew, this system became unwieldy and costly to maintain. FEMA analysis indicated that from a technical perspective, this system was not essential to the estimation of flood damages since, for example, flood frequency data were found to be similar across communities.

FEMA has not revisited its class-rating approach since its inception although certain program elements have changed since that time.

For example, program participation has more than doubled from just over 2 million policies to more than 5.2 million from the late 1980s to the late 2000s and increased numbers of properties

have been constructed on SFHAs. As a result of the growth in the program, the rate classes may not accurately reflect the actual flood risk to individual properties and averaging may no longer accurately reflect differences in rates within zones.

Collectively, these factors raise questions about FEMA's rate-setting process and increase the risk that NFIP full-risk premiums rates may not accurately reflect the underlying risk of flood loss. As a result, the premiums collected by FEMA for full-risk policies may not be sufficient to cover the risks associated with those policies. If the premiums are not sufficient, FEMA will likely have to continue to borrow from the Treasury and could face a future of financial instability because of its ongoing inability to cover claims and expenses.

NFIP'S "Flood Mapping" System

Potentially outdated and inaccurate data about flood probabilities and damage claims, as well as outdated flood maps, raise questions about whether the NFIP's full-risk premiums reflect the actual risk of flooding.

Some of the data used to estimate the probability of flooding have not been updated since the 1980s. Similarly, the claims data used as inputs to the model may be inaccurate because of incomplete claims records and missing data.

More importantly - from a risk management perspective - some of the maps that FEMA and the NFIP use to set premium rates remain out of date despite recent modernization efforts. For instance, FEMA does not account for ongoing and planned development making some maps outdated shortly after their completion. And it does not map for long-term erosion, further increasing the likelihood that data used to set rates are inaccurate.

FEMA also sets flood insurance rates on a nationwide basis, failing to account for many topographic factors that are relevant to flood risk for particular locations and individual properties.

At the highest levels, FEMA and NFIP management understands that the NFIP flood maps are outdated and need to be replaced. But, at the frontlines, there is resistance to more accurate data and reporting.

Since the late 2000s, when the NFIP began its efforts to modernize flood maps across the country, it has faced resistance from communities and homeowners when remapping properties into higher-risk flood zones with higher rates.

(With respect to the impact of older maps on rate setting, FEMA states that older maps are not always outdated, and that in many areas the flood hazard has not changed or is possibly decreasing. While some maps may not have changed over the past 10 to 15 years, it is uncertain how many maps fall into this category and FEMA provided no analysis to support this contention.)

As a result, FEMA made a policy decision to allow certain properties remapped into riskier flood zones to keep their previous lower rates. Like subsidized rates, these "grandfathered" rates do not reflect the actual risk of flooding to the properties and do not generate sufficient premiums to cover expected losses.

FEMA officials say that the decision to grandfather rates was based on considerations of "equity, ease of administration, and goals of promoting floodplain management." But FEMA does not collect data on grandfathered properties or measure their financial impact on the program. As a result, it does not know:

- how many such properties exist,
- their exact location, or
- the volume of losses they generate.

FEMA officials have stated that, beginning in October 2010, they would indicate on all new policies whether or not they were grandfathered - but they admit that they would still be unable to identify grandfathered properties among existing policies.

This whole matter of "grandfathering" lower premiums is another example of a subsidy that warps the accurate evaluation of flood risks. And it's another example of a subsidy that the Feds fail to recognize as such - bureaucrats at FEMA and the NFIP insist that grandfathered rates are different than subsidized rates.

Strictly speaking (and extremely strictly speaking), this may be true. But no reasonable person doubts that grandfathering flood insurance policyholders into lower risk categories is a form of subsidy.

Said another way, homeowners who are remapped into high-risk areas and do not currently have flood insurance may be required to purchase it at the full risk rate.

Various individuals and groups have made suggestions about how the NFIP could make its premium rates more reflective of long-term flood risks. These suggestions include:

- •eliminating, reducing or targeting premium subsidies based on need;
- •improving oversight of WYO insurers and payments to them,
- •updating the NFIP rate-setting process,
- •fully applying internal controls, and
- •strengthening oversight of contractors, among others.

But taking any of these steps would raise rates and potentially reduce participation in NFIP.

FEMA and the NFIP could also address the impact of repetitive loss properties by expanding mitigation efforts to target those properties that are at highest risk. However:

1. such an action would require congressional authorization, and
2. doing so would include actions such as elevation, relocation and demolition that would be costly to taxpayers and could take years.

Finally, congress could amend laws regarding coverage for homeowners who refuse to mitigate, and streamline the various mitigation grant programs within FEMA. But making premium rates more reflective of flood risk would require actions by FEMA and Congress. Because subsidized premium rates are required by law, addressing their associated costs would require congressional action.

Targeting subsidies based on need is an approach used by other federal programs and could help ensure that those needing the subsidy would have access to it and retain their coverage. Unlike other agencies that provide - and are allocated funds for - traditional subsidies, NFIP does not receive an appropriation to pay for shortfalls in collected premiums caused by its subsidized rates. It just borrows from the Treasury Department to make up the shortfalls.

According to the GAO:

...one option to maintain the subsidies but improve NFIP's financial stability would be to rate all policies at the full-risk rate and to appropriate subsidies for qualified policyholders. In this way, the cost of such subsidies would be more transparent, and policyholders would be better informed of their flood risk. Depending on how such a program was implemented, NFIP might be able to charge more participants rates that more accurately reflect their risk of flooding. However, raising premium rates for some participants could also decrease program participation, and low-income property owners and renters could be discouraged from participating in NFIP if they were required to prove that they met the requirements for a subsidy.

Of course, FEMA and the NFIP could end grandfathered rates - this would help ease the financial burden of the subsidized premiums. But that's also a political challenge. FEMA decided to allow grandfathering after consulting with congress, its oversight committees and other stakeholders. Groups like the GAO have recommended that the NFIP take steps to:

- •ensure that information was collected on the location, number, and losses associated with existing and newly created grandfathered properties in the NFIP; and
- •analyze the financial impact of these properties on the flood insurance program.

With such information, FEMA and Congress would be better informed on the extent to which these rates contribute to the NFIP's financial challenges. But these suggestions have been resisted by all sides, from congressional staffs to insureds and other "stakeholders."

Catastrophic Loss Fund

Perhaps the simplest suggestion for reforming the NFIP to achieve some level of financial solvency is that it should create a capital surplus fund - from which it could pay claims during years of heavy losses.

Building such a fund would require at least two major predicates:

1. charging premium rates that, in some cases, could be more than double or triple current rates and
2. at least several years without catastrophic losses.

And there are several other challenges to creating a catastrophic loss fund:

- unless NFIP's current debt were forgiven, even with significant premium increases NFIP probably could not collect enough to pay the $766 million in annual interest and also contribute to a loss fund;
- a catastrophic loss fund might not eliminate NFIP's need to borrow funds for larger-than-expected losses that occurred before the fund had been built up. Further borrowing would require either a longer period to rebuild the loss fund or more debt forgiveness from Congress;
- even if NFIP's debt were forgiven, building a catastrophic loss fund could require significant premium rate increases. Higher rates could reduce participation in the NFIP, but without them it could take at least 10 years to fully fund a catastrophic loss fund equal to one percent of NFIP's total loss exposure.

A loss fund equal to one percent of total NFIP exposure would require approximately $18 billion in cash.

While private insurers generally use reinsurance to hedge their risk of catastrophic losses, it is unclear whether the private reinsurance market would be willing to offer such coverage to NFIP.

In the absence of reinsurance and a surplus fund, the Treasury Department will continue to act as the effective reinsurer for the NFIP - and be the financial backstop for the program.

Counting on this backstop has created the NFIP's current $19 billion debt to the Treasury.

The GAO analyzed several loss-funding scenarios. It noted that "the potential for catastrophic losses makes estimating losses complex and difficult." It also requires making a number of assumptions. For its project, the GAO assumed that:

- the number of NFIP policies would remain at 2007 levels,
- Congress would forgive the current $19 billion in debt,
- the NFIP would earn a 4 percent annual investment yield on contributions,
- no catastrophic losses would occur before the fund was fully funded,
- the target would be a catastrophic loss fund of $18 billion no earlier than 2020.

Because no commonly agreed-upon methodology existed for incorporating losses from the 2005 hurricanes into estimates of future losses, the GAO considered two scenarios; one in which losses were not incorporated and one in which they were incorporated. It also analyzed a scenario in which the goal was to fund a catastrophic loss fund more quickly.

Here are the results the GAO found:

Under scenario one (fully-funded one-percent reserve by 2020, losses from 2005 hurricanes not included):

•From 2009 to 2020, the average subsidized premium would increase from $840 to more than $2,116, while average full-risk premium would rise from $358 to around $902.
•The fund could reach the target of approximately $18 billion in 2020 by increasing premium rates by, on average, about 8 percent annually, assuming no larger than average expected losses.
•NFIP could begin making limited contributions to the fund in 2009, but premiums would not be high enough for at least several years to make the proposed annual 7.5 percent contribution and pay expected losses.

Under scenario two (fully-funded one-percent reserve by 2020, losses from 2005 hurricanes included):

•From 2009 to 2020, the average subsidized premium would increase from around $840 to $2,696, and the average full-risk premium would rise from around $358 to $1,149.
•The fund could reach the target of approximately $18 billion in 2020 by increasing premium rates by, on average, about 15 percent in the first 3 years, 14 percent in year 4, and 8 percent thereafter, assuming no larger than average expected losses.
•As with scenario 1, NFIP could begin making limited contributions to the fund in 2011, but premiums would not be high enough for at least several years to make the proposed annual 7.5 percent contribution and pay expected losses.

Under scenario three (fully-funded one-percent reserve by 2016, losses from 2005 hurricanes included):

•Subsidized premiums would increase 25 percent annually until reaching full-risk rates, and full-risk rates would increase by 15 percent a year (the maximum allowable rate under proposed legislation).
•It would take approximately 7 years to reach the loss fund total in 2016.
•From 2009 to 2016, subsidized and full-risk rates would increase from $840 to $3,577 and $358 to $953 in 2016 respectively.

None of these options are considered solid political prospects.

Data-Management Problems at FEMA

More than any other technical matter, the NFIP has major data management problems. We've hinted at some of these before. In this section, we'll drill down a bit into the details of these IT problems.

At FEMA, a Contracting Officer's Technical Representative (COTR) and staff (referred to as "monitors") are responsible for, respectively, ensuring compliance with contract terms and regularly monitoring and reporting on the extent to which NFIP contractors meet standards in performance areas specified in the contracts.

This compliance involves the flow of a lot of information-some involving rating and underwriting data, some involving claims data.

Internal control standards for the federal government state that records should be properly managed and maintained. But the NFIP lacked records for the majority of the monitoring reports that the GAO requested during its 2008 and 2010 examinations.

In its 2010 report, the GAO noted:

FEMA offices did not coordinate information and actions relating to contractors' deficiencies and payments, and in some cases key officials were unaware of decisions on contractors' performance. In particular, our review of monitoring reports for one contract revealed a lack of coordination between the COTR and the contracting officer.

As a result, FEMA could not ensure that the contractor had adhered to the contract's requirements and lacked information critical to effective oversight of key NFIP data collection, reporting, and insurance functions. Given NFIP's reliance on contractors, it is important that FEMA have in place

adequate controls that are consistently applied to all contracts. Consistent with our findings in prior work, the DHS inspector general has also identified weaknesses in FEMA's internal controls and financial reporting related to the NFIP.

In plain English: The problem is so bad that FEMA and the NFIP can't even say how bad the problem is.

To manage flood policy and claims information that it obtains from insurance companies, the NFIP's Bureau and Statistical Agent (BSA) relies on an IT system from the 1980s that's difficult and costly to sustain and that doesn't adequately support the NFIP's mission needs. According to the GAO:

This system consists of over 70 interfaced applications that utilize monthly tape and batch submissions of policy and claims data from insurance companies. The system also provides limited access to NFIP data. Further, identifying and correcting errors in submission requires between 30 days and 6 months and the general claims processing cycle itself is 2 to 3 months.

To address the limitations of this system, NFIP launched a program in 2002 to acquire and implement a modernization and business improvement system, known as NextGen. As envisioned, NextGen was to accelerate updates to information obtained from insurance companies, identify errors before flood insurance policies went into effect, and enable FEMA to expedite business transactions and responses to NFIP claims when policyholders required urgent support. As such, the system would support the needs of a wide range of NFIP stakeholders, including FEMA headquarters and regional staff, WYO insurers, vendors, state hazard mitigation officers, and NFIP state coordinators.

...despite having invested roughly $40 million over 7 years, FEMA has yet to implement NextGen. Initial versions of NextGen were first deployed for operational use in May 2008. However, shortly thereafter system users reported major problems with the system, including significant data and processing errors. As a result, use of NextGen was halted, and the agency returned to relying exclusively on its mainframe-based legacy system while NextGen underwent additional testing. In late 2009, after this testing showed that the system did not meet user needs and was not ready to replace the legacy system, further development and deployment of NextGen was stopped, and FEMA's Chief Information Officer began an evaluation to determine what, if anything, associated with the system could be salvaged.

As this course was written, FEMA had not yet implemented NextGen or any other IT management system-and the legacy system it was using to track flood insurance information was still limping along. Inadequately.

FEMA, the NFIP and Hurricanes

The IT problems limit the NFIP's ability to identify and address financial transaction control breakdowns that occur during times of catastrophic flood losses. The clearest example of this kind of breakdown: after the 2005 hurricane - which included Hurricane Katrina - FEMA wasn't able even to estimate the NFIP's losses for several years.

And its initiatives to improve specific internal control weaknesses and the overall NFIP control environment since the 2005 hurricanes have done little to address the NFIP's financial data deficiencies.

FEMA has made some improvements, such as revising its claim re-inspection selection methodology to provide a true, random selection of statistically-representative claim files. However, the modified re-inspection methodology still doesn't include all claims. FEMA has also implemented a tracking system to monitor the number of WYO biennial audits obtained and reviewed. And it has implemented what it calls "a system modernization development and implementation effort" under way. But these efforts won't produce any measurable results for several years.

In the meantime, flood losses have imposed a significant financial burden on the federal government. Until 2004, NFIP was able to cover most of its losses. However, as we've noted, in order to pay claims arising from the 2005 hurricanes (Katrina, Rita and Wilma) congress had to authorize loans to NFIP of about $16.8 billion from the Treasury that the program used to cover the enormous number of claims.

Given this large debt and ongoing complex financial challenges created by the 2005 Gulf Coast hurricanes, the fiscal sustainability of the flood insurance program has come under scrutiny.

In March 2006, the GAO designated NFIP as a high-risk program - in part because of the program's financial uncertain condition and its near-term inability to repay borrowed funds.

The program remained on the GAO's January 2019 list of high-risk federal programs.

FloodSmart is an integrated mass marketing campaign FEMA launched in 2004 to educate the public about the risks of flooding - and to encourage the purchase of flood insurance. One of the main tools of the FloodSmart program has been a series of television ads that show nicely-appointed residential homes being flooded in dramatic fashion.

According to FEMA marketing materials:

This program was designed to educate and inform partners, stakeholders, property owners, and renters about insuring their homes and businesses against flood damage. Since the start of the FloodSmart campaign in 2004, NFIP has seen policy growth of more than 24 percent and [has] 5.6 million policies in force.

But not all observers are so optimistic. The GAO points out that flood insurance is so poorly marketed and promoted that no one can be sure which efforts really work - because the base against which the efforts are compared is to ineffective.

On a more technical note, the GAO concluded:

Most WYO insurers generally offered flood insurance when it was requested but did not strategically market the product as a primary insurance line. FEMA has set only one explicit marketing goal - to increase policy growth by 5 percent each year - and does not review the WYO insurers' marketing plans. It therefore lacks the information needed to assess the effectiveness of either the WYO insurers' efforts to increase participation or the bonus program itself. For example, FEMA does not know the extent to which sales increases may reflect external factors such as flood events or its own FloodSmart marketing campaign rather than any effort on the part of the insurers.

Pollution Coverage under the NFIP Forms

One key issue - although a bit of a side issue - that comes up in some flood claims disputes is whether NFIP insurance covers damage from "waterborne material" and pollutants such as oil, which are often present in flood waters.

In fact, flood waters frequently contain a toxic mix of pollutants, including sewage, household, lawn care and industrial chemicals, automotive fuels and lubricants, medical waste, garbage, etc.

In the NFIP Dwelling Form, the only exclusion in Section V - Exclusions that references pollution is the following:

Exclusions. We do not pay for the testing for or monitoring of pollutants unless required by law or ordinance.

In Section III - Coverage D Increased Cost of Compliance, the following pollution-related exclusion is included, related to testing and monitoring, etc. of pollution:

Exclusions. 5.b. The cost associated with enforcement of any ordinance or law that requires any insured or others to test for, monitor, clean up, remove, contain, treat, detoxify or neutralize, or in any way respond to, or assess the effects of pollutants.

In the General Property Form, there is no pollution exclusion in Section V - Exclusions. However, in Section III - Other Coverages, there is a sublimit of $10,000 for pollution damage, as follows:

Pollution Damage

Will pay for damage caused by pollutants to covered property if the discharge, seepage, migration, release, or escape of the pollutants is caused by or results from flood. The most we will pay under this coverage is $10,000. This coverage does not increase the Coverage A or Coverage B limits of liability. Any payment under this provision when combined with all other payments for the same loss cannot exceed the replacement cost or actual cash value, as appropriate, of the covered property. This coverage does not include the testing for or the monitoring of pollutants unless required by law or ordinance.

As in the Dwelling Form, the General Property Form also has a pollution exclusion in Section III - Coverage D Increased Cost of Compliance, related to testing and monitoring, etc. of pollution that is identical to Exclusion 5.b. above.

In the Dwelling Form, damage to covered property from a flood that is otherwise covered by the flood policy is not impaired by the presence of pollutants such as oil from the oil spill in the Gulf. In addition, testing or monitoring of pollutants which is required by a law or ordinance is also covered. For claims covered under Coverage D Increased Cost of Compliance (ICC), the testing, monitoring, clean up, etc. that is required by ordinance or law is not covered. Note that ICC only has a limit of $30,000.

Under the General Property Form, there is no pollution exclusion for damage to covered property, but there is a sublimit of $10,000 for damage by a pollutant where a flood caused the discharge, seepage, migration, release, or escape of the pollutant - in this case, oil from the Gulf. It is unclear exactly how a claims-adjustment expense specifically related solely to damage by the pollutant (oil) can be determined in situations like a storm surge. However, to the degree that such costs can be isolated and assigned to the presence of a pollutant such as oil, the sublimit of $10,000 would apply.

Mortgage Portfolio Protection Program

The Mortgage Portfolio Protection Program (MPPP) was introduced in 1991, as an additional tool to assist the mortgage lending and servicing industries in bringing their mortgage portfolios into compliance with the flood insurance requirements of the Flood Disaster Protection Act of 1973.

The MPPP is not intended to act as a substitute for the need for mortgagees to review all mortgage loan applications at the time of loan origination and comply with flood insurance requirements as appropriate.

Proper implementation of the mandatory purchase requirements usually results in mortgagors, after their notification of the need for flood insurance, either showing evidence of such a policy, or contacting their insurance agent/producer or their insurer to purchase the necessary coverage. It is intended that flood insurance policies be written under the MPPP only as a last resort, and only on mortgages whose mortgagors have failed to respond to the various notifications required by the MPPP.

When a mortgagee or a mortgage-servicing company discovers, at any time following loan origination, that there is no evidence of flood insurance on a property in a Special Flood Hazard Area (SFHA), then the MPPP may be used by such lender/servicer to obtain (force-place) the required flood insurance coverage. The MPPP process can be accomplished with limited underwriting information and with special flood insurance rates.

It will be the Write Your Own (WYO) Company's responsibility to notify the mortgagor of all coverage limitations at the inception of coverage and to impose those limitations that are applicable at the time of loss adjustment.

With the implementation of the MPPP, there is no change in the method of WYO Company allowance from that which is provided in the Financial Assistance/Subsidy Arrangement for all flood insurance written.

No portion of the allowance that a WYO Company retains under the WYO Financial Assistance/Subsidy Arrangement for the MPPPmay be used to pay, reimburse, or otherwise remunerate a lending institution, mortgage servicing company, or other similar type of company that the WYO Company may work with to assist in its flood insurance compliance efforts.

The only exception to this is a situation where the lender/servicer may be actually due a commission on any flood insurance policies written on any portion of the institution's portfolio because it was written through a licensed property insurance agent/producer on their staff or through a licensed insurance agency owned by the institution or servicing company.

Any WYO Company participating in the MPPP must notify the lender or servicer, for which it is providing the MPPP capability, of the requirements of the MPPP. The WYO Company must obtain signed evidence from each such lender or servicer indicating their receipt of this information, and keep a copy in its files.

In order to participate in the MPPP, the lender (or its authorized representative, which typically will be the WYO Company providing the coverage through the MPPP) must notify the borrower of the following, at a minimum:

- the requirements of the Flood Disaster Protection Act of 1973;
- the flood zone location of the borrower's property;
- the requirement for flood insurance;
- the fact that the lender has no evidence of the borrower's having flood insurance;
- the amount of coverage being required and its cost under the MPPP; and
- the options of the borrower for obtaining conventionally underwritten flood insurance coverage and the potential cost benefits of doing so.

The MPPP will be allowed only in conjunction with mortgage portfolio reviews and the servicing of those portfolios by lenders and mortgage servicing companies. The MPPP is not allowed to be used in conjunction with any form of loan origination.

Other relevant points:

- The standard NFIP rules apply, and all types of property eligible for coverage under the NFIP will be eligible for coverage under the MPPP.
- The force-placement capability will be offered by the WYO Companies only and not by the NFIP Servicing Agent.
- The policy will be written covering the interest of both the mortgagee and the mortgagor. The name of the mortgagor must be included on the Application Form. It is not, however, necessary to include the mortgagee as a named insured because the Mortgage Clause (section VII.Q. of the Dwelling Form and the General Property Form) affords building coverage to any mortgagee named as mortgagee on the Flood Insurance Application. If contents coverage for the mortgagee is needed, the mortgagee should be included as a named insured.
- NFIP policies written under the MPPP will be for a term of 1 year only (subject to the renewal notification process).
- Both building and contents coverage will be available under the MPPP. The coverage limits available under the Regular Program will be $250,000 for building coverage and $100,000 for contents. If the WYO Company wishes to provide higher limits that are available to other occupancy types such as other residential or non-residential, it may do so only if it can indicate that occupancy type as appropriate. If the mortgaged property is in an Emergency Program community, then the coverage limits available will be $35,000 for building coverage and $10,000 for contents. Again, if the higher limits are desired for other

types of property, then the building occupancy type must be provided at the inception of the policy or when that information may become available, but it must be prior to any loss.
•The current SFIP Dwelling Form and General Property Form will be used, depending upon the type of structure insured. In the absence of building occupancy information, the Dwelling Form should be used.
•The NFIP rules for the waiting period and effective dates apply to the MPPP.
•The lender or servicer (or payor) has the option to follow its usual business practices regarding premium payment, so long as the NFIP rules are followed.
•The MPPP will require less underwriting information than normally required under the standard NFIP rules and regulations. The MPPP data requirements for rating and processing are, at a minimum:

- •Name and mailing address of insured (mortgagor; also see Dual Interest);
- •Address of insured (mortgaged) property;
- •Community name, number, map panel number and suffix, and program type (Emergency and Regular);
- •Occupancy type (so statutory coverage limits are not exceeded. This information may be difficult to obtain. Also see Coverage Offered.);
- •NFIP flood zone where property is located (lender must determine, in order to determine if flood insurance requirements are necessary and to use the MPPP);
- •Amount of coverage;
- •Name and address of mortgagee; and
- •Mortgage loan number.

•In addition to the routine information, such as amounts of coverage, deductibles, and premiums, that a WYO Company may place on the policy declarations page issued to each insured under the NFIP, the following messages are required:

1.This policy is being provided for you as it is required by Federal law as has been mentioned in the previous notices sent to you on this issue. Since your mortgage company has not received proof of flood insurance coverage on your property in response to those notices, we provide this policy at their request.
2.The rates charged for this policy may be considerably higher than those that may be available to you if you contact your local insurance agent/producer (or the WYO Company).
3.The amounts of insurance coverage provided in this policy may not be sufficient to protect your full equity in the property in the event of a loss.
4.You may contact your local insurance agent/producer (or WYO Company) to replace this policy with a conventionally underwritten SFIP, at any time, and typically at a significant savings in premium.

•The WYO Company may add other messages to the declarations page and make minor editorial modifications to the language of these messages if it believes any are necessary to conform to the style or practices of that WYO Company, but any such additional messages or modifications must not change the meaning or intent of the above messages.
•Since the amount of underwriting data obtained at the time of policy inception will typically be limited, the extent of any coverage limitations (such as when replacement coverage is not available or coverage is limited because the building has a basement or is considered an elevated building with an enclosure) will be difficult to determine. It is, therefore, the responsibility of the WYO Company to notify the mortgagor/insured of all coverage limitations at the inception of coverage and impose any that are applicable at the time of the loss adjustment.
•In the event that the premium payment received is not sufficient to purchase the amounts of insurance requested, the policy shall be deemed to provide only such insurance as can be purchased for the entire term of the policy for the amount of premium received.
•There are no changes from the standard practices of the NFIP for these provisions. The coverage basis will depend on the type of occupancy of the building covered and the amount of coverage carried.

•A $1,000 deductible is applicable for policies written under the MPPP.
•The NFIP Flood Insurance Manual rules for cancellation/nullification are to be followed, when applicable.
•An MPPP policy may not be endorsed to convert it directly to a conventionally underwritten SFIP. Rather, a new policy application, with a new policy number, must be completed according to the underwriting requirements of the SFIP, as contained in the NFIP Flood Insurance Manual. The MPPP policy may be endorsed to assign it under rules of the NFIP. It may also be endorsed for other reasons such as increasing coverage.
•Current NFIP rules remain unchanged; therefore, an MPPP policy may be assigned to another mortgagor or mortgagee. Any such assignment must be through an endorsement.
•A list of the WYO Companies that participate in the MPPP is available on FEMA's website.