

C O M M E N T S

Changing the National Flood Insurance Program for a Changing Climate

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Congress established the National Flood Insurance Program (NFIP) in 1968 to reduce flood damages nationwide and ease the federal government's financial burden for providing disaster recovery.¹ To achieve this goal, the program was designed to perform three primary functions. First, the program provides federally backed insurance to property owners and renters. Second, the program established minimum requirements for building, land use, and floodplain management practices that local communities must adopt in order for their residents to be eligible to purchase NFIP insurance coverage. Third, the program is responsible for mapping high flood-risk areas. These maps inform local land use decisions as well as the pricing of flood insurance premiums.

Theoretically, the NFIP should have deterred development in flood-prone areas, ensured that any new development in the floodplain was designed to minimize the risk of flood damage, and reduced federal expenditures on disaster recovery costs. In practice, the rising debts of the program and growing severity and frequency of flood disasters imply the opposite is true. One significant factor contributing to this shortcoming is that the NFIP is predicated on the assumption that flood risks are static and change little over time. Climate change is proving that assumption to be extremely dangerous and costly.

This Comment will assess the current state of the NFIP and the threats to it from climate change (Part I). In addition, it explores several strategies to change the NFIP for a changing climate.

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1. National Flood Insurance Act of 1968, as amended, and the Flood Disaster Protection Act of 1973, 42 U.S.C.A. §§4001 et seq. It was further modified by the National Flood Insurance Reform Act of 1994 and the Flood Insurance Reform Act of 2004.

These strategies include:

- Encourage long-term migration away from coastal areas and floodplains through a national “discounts for buyouts” program that would offer homeowners discounts on their flood insurance premiums now, in exchange for a commitment to accept a future buyout once their home is substantially damaged by flooding (Part II).
- Expedite bringing vulnerable properties into compliance with floodplain development requirements that decrease the potential for flood damage by community adoption of a cumulative and/or lower threshold “substantial damage” or “substantial improvement” standard (Part III).
- Increase the transparency and availability of information on flood damages, number and cost of policies, information on repeatedly flooded properties, costs of the program to the nation, and the level of enforcement by participating communities through a national “homeowner right-to-know” provision, and at the state level improve disclosure policies that inform homebuyers about flood-related risks (Part IV).
- Improve monitoring, tracking, and disclosure of data related to community compliance and provide resources to address barriers to enforcement that impede implementation of the floodplain regulations at the community level (Part V).

Collectively, these reforms can help restructure the NFIP to prevent escalation of debts, reduce taxpayer burden, and most importantly increase the safety of millions of vulnerable homeowners.

I. The NFIP and Climate Change

Today, the NFIP has 5.1 million flood insurance policies providing \$1.3 trillion of insurance coverage to policy-

holders in more than 22,000 communities spanning all 50 states and other U.S. territories.² Over its lifetime, the NFIP has provided more than \$68 billion to help policyholders rebuild their homes in the aftermath of inland floods and coastal storms.³ As a result of the staggering losses from the 2017 hurricane season, the U.S. Congress canceled \$16 billion of debt accrued by the NFIP.⁴ Even so, as of July 2018, the NFIP remained \$20.5 billion in debt because it collects too little in insurance premiums from policyholders to cover the damages it must pay out.⁵

More importantly, these debts represent more than a fiscal crisis and taxpayer burden, they indicate the prevalence of hundreds of thousands of American households living under the threat of devastating loss. Hurricanes Harvey, Irma, and Maria alone damaged close to 100,000 homes and businesses.⁶ And since the inception of the NFIP, more than 1.8 million claims have been paid out.⁷ Many of these claims are for the same repeatedly damaged structures.⁸ When a house floods, damages can include waterlogged drywall, warped floors, damaged mechanical systems, and potential mold infestations, not to mention the disruption to people's lives through the loss of sentimental family heirlooms, income, or, in the worst case, a loved one.

Climate change will continue to drive these debts and hardships ever higher by increasing flood risks through the United States. It is well established that climate change increases flood risk through a number of factors that combine synergistically, including heavier precipitation events, sea-level rise, and greater storm surge. The U.S. Global Climate Change Research Program (USGCCRP), the body designated by Congress to determine the state of climate science to inform federal policy, finds that heavy precipita-

tion events have increased in both intensity and frequency in most parts of the United States.⁹

In their most recent assessment, the USGCCRP concludes that global average sea levels will rise by one to four feet by 2100 and that a rise of as much as eight feet by 2100 is possible.¹⁰ Further, sea-level rise along the East and Gulf Coasts of the United States will exceed the global average. Rising sea levels have already increased the number of tidal floods each year that cause minor impacts (also called “nuisance floods”) by fivefold to tenfold since the 1960s in several U.S. coastal cities, and this trend is already accelerating in more than 25 Atlantic and Gulf Coast cities.¹¹

A Federal Emergency Management Agency (FEMA)-sponsored study conducted by AECOM, a multinational engineering firm, estimates the Special Flood Hazard Area (SFHA), the area within the 100-year floodplain subject to development restrictions under the NFIP, will grow by between 40% to 45% by 2100, depending on whether coastal recession is assumed or not.¹² Under the assumption of a fixed shoreline, AECOM projects that the total number of NFIP policies may increase by approximately 100% by 2100 due to the combination of population growth and a larger SFHA due to climate change.¹³ Under this scenario, the average loss cost per policy may increase approximately 90% by 2100, and the average premium per policy would need to increase as much as 70% in today's U.S. dollars by 2100 in order to offset the projected increase in loss cost.¹⁴

Sea-level rise will also further exacerbate the cycle of “flood, rebuild, repeat” plaguing the NFIP. A proportionally small number of properties that are repeatedly repaired and rebuilt in areas vulnerable to flooding, called “severe repetitive loss” (SRL) properties, contribute to the rising debts of the program. The NFIP paid \$5.5 billion to repair and rebuild more than 30,000 SRL properties between 1978 and 2015.¹⁵ These SRL properties constitute only 0.6% of the 5.1 million properties insured through the NFIP, but have consumed a disproportionate 9.6% of all damages paid out of the NFIP as of 2015.¹⁶ The Natural Resources Defense Council (NRDC) estimates that three feet of sea-level rise by 2100 could result in an additional

2. Federal Emergency Management Agency (FEMA), *Policy Statistics Countrywide*, <https://perma.cc/3NR6-RSZF> (last updated Sept. 30, 2018). Roughly, 20% of the nationwide policy base is subsidized. Holders of these policies pay premiums that are 40% to 45% of their true risk rate. See GOVERNMENT ACCOUNTABILITY OFFICE (GAO), FLOOD INSURANCE: MORE INFORMATION NEEDED ON SUBSIDIZED PROPERTIES 6 (2013) (GAO-13-607).

3. FEMA, *NFIP Loss Statistics Countrywide*, <https://perma.cc/KV55-V7TW> (last updated Sept. 30, 2018).

4. DIANE P. HORN & BAIRD WEBEL, CONGRESSIONAL RESEARCH SERVICE, PRIVATE FLOOD INSURANCE AND THE NATIONAL FLOOD INSURANCE PROGRAM 1 (2018) (stating Congress canceled \$16 billion of NFIP debt to allow the program to pay claims).

5. DIANE HORN, CONGRESSIONAL RESEARCH SERVICE, CRS INSIGHT: NATIONAL FLOOD INSURANCE PROGRAM BORROWING AUTHORITY 5 (2018) (showing the NFIP had accrued \$20.5 billion in debt). See also U.S. GAO, FLOOD INSURANCE: COMPREHENSIVE REFORM COULD IMPROVE SOLVENCY AND ENHANCE RESILIENCE 1 (2017) (GAO-17-425) (stating the debt level in March 2017, before Hurricanes Harvey, Maria, and Irma, stood at \$24.6 billion due and collection of premiums would likely be insufficient to repay the debt), available at <https://perma.cc/F6FL-3GXL>.

6. FEMA, *Significant Flood Events*, <https://www.fema.gov/significant-flood-events> (last updated Jan. 30, 2019).

7. *Supra* note 3.

8. FEMA, Severe Repetitive Loss Property Data, 1978-2015, acquired June 7, 2016, by the Natural Resources Defense Council (NRDC) through a Freedom of Information Act request submitted June 20, 2014 [hereinafter FEMA SRLP Data].

9. Donald J. Wuebbles et al., *Executive Summary*, in CLIMATE SCIENCE SPECIAL REPORT: FOURTH NATIONAL CLIMATE ASSESSMENT, VOLUME I 20 (D.J. Wuebbles et al. eds., U.S. Global Change Research Program 2017), <https://perma.cc/9GYV-ZKDV>.

10. *Id.* at 25-26.

11. *Id.* at 27.

12. AECOM, THE IMPACT OF CLIMATE CHANGE AND POPULATION GROWTH ON THE NATIONAL FLOOD INSURANCE PROGRAM THROUGH 2100, at ES-7 (2013), <https://perma.cc/5RVD-A4VQ>. Coastal recession assumes the shoreline retreats inland, which could serve to reduce the size of the floodplain.

13. *Id.*

14. *Id.* at ES-8.

15. ROBERT MOORE, NRDC, SEEKING HIGHER GROUND: HOW TO BREAK THE CYCLE OF REPEATED FLOODING WITH CLIMATE-SMART FLOOD INSURANCE REFORMS 2 (2017), <https://perma.cc/Q66X-D4HE>.

16. *Id.*

820,000 SRL properties, and six feet of sea-level rise would result in 2.57 million more SRL properties.¹⁷

II. Encouraging Relocation of the Most Vulnerable Homeowners Through “Discounts for Buyouts”

The NFIP’s emphasis on helping policyholders repeatedly rebuild their homes in the aftermath of a flood disaster is an increasingly problematic feature of the program. Typically, when a homeowner with NFIP coverage files a damage claim, he or she will receive payment and rebuild or repair the home in the same exact location. The result is that a growing number of people find themselves trapped in a cycle of “flood, rebuild, repeat.”

The NFIP could be substantially improved through a mechanism that makes it easier for a homeowner to choose to relocate to a safer location, an action millions of Americans may need to do in the coming decades as sea level rises.¹⁸ Below, we discuss the structure and logic behind a “discounts for buyouts” mechanism that would allow homeowners to receive a discount on their insurance premium in exchange for their advance agreement to sell their property and relocate once their home becomes substantially damaged by flooding.

A. The Climate Change-Heightened Challenge of SRL Properties

As discussed above, the debts of the NFIP accrue disproportionately from a small subset of properties that are repeatedly repaired and rebuilt in areas vulnerable to flooding, called SRL properties. FEMA data indicate that SRL properties flood every two to three years and have been rebuilt an average of five times.¹⁹ Climate change and sea-level rise will only deepen the issue of SRL properties. NRDC has estimated that if sea levels rise three to six feet by the end of the century, the NFIP could pay between \$143 billion and \$447 billion in flood insurance claims to the owners of 820,000 to 2.16 million homes to repeatedly rebuild in coastal areas.²⁰ This is only a portion of the estimated 4.2 to 13.1 million homes that may be inundated by three to six feet of sea-level rise.²¹

In at least some cases, it would be more cost effective to purchase SRL properties if homeowners want to relocate, rather than repeatedly rebuild. SRL properties are predom-

inantly single-family homes (81%), but also include multi-unit structures, larger residential buildings, and business properties.²² Generally, it is more likely for homes with a lower property value to suffer flood damages that exceed the property’s value. Among SRL single-family homes worth less than \$250,000, the average sum of all damages (\$133,923) exceeded the value of the average home (\$109,882).²³ For this subset of properties, the NFIP is expending greater resources keeping these homeowners in a highly vulnerable situation than it would expend to help them move to a safer location.

However, if the NFIP placed less emphasis on rebuilding after a flood, and instead offered the homeowners the option to receive assistance to relocate to higher ground, then vulnerable households could avoid the “flood, rebuild, repeat” trap. The assistance to relocate could be provided by the NFIP in the form of a guarantee to purchase qualifying properties, also known as a “buyout.” Buyouts can both lower the amount of flood damage claims paid by the NFIP and enable homeowners to relocate, avoiding the hardship of additional floods. Yet, only one in five of 30,000 SRL properties analyzed by NRDC (5,961 properties) received some form of federal financial assistance to reduce the overall risk of flood damage, usually by elevating the house on pilings, raising the foundation, or relocating.²⁴ Of those who received assistance, only 2,601 property owners received buyouts, enabling them to move to higher ground.²⁵

B. The “Discounts for Buyouts” Proposal

The NFIP can help address these challenges through a “discounts for buyouts” program that would offer qualifying homeowners a guarantee of a future buyout as a benefit of their flood insurance coverage, in exchange for a discounted insurance rate.²⁶ Under the “discounts for buyouts” proposal, qualifying homeowners would voluntarily commit to accepting a buyout of the home when it is substantially damaged in a future flood disaster.²⁷ This agreement would ensure that homeowners who want to move will receive assistance to relocate to higher ground. The local community or the state would be responsible for purchasing the damaged home using funds provided by FEMA through the National Flood Insurance Fund.²⁸ Once the buyout is complete, the damaged home would be demolished, the property would become open space, and the owners would move to a safer location.

17. *Id.* at 12.

18. See generally Matthew Hauer et al., *Millions Projected to Be at Risk From Sea-Level Rise in the Continental United States*, 6 NATURE CLIMATE CHANGE 691 (2016) (projecting three feet of sea-level rise could inundate 4.2 million Americans and six feet of sea-level rise could inundate 13.1 million Americans by 2100).

19. FEMA SRLP Data, *supra* note 8.

20. These projections are based on the likely number of properties that could be affected by sea-level rise, the proportion of those properties that are likely to have NFIP coverage, and the average cumulative amount of damage suffered by repeatedly flooded properties. MOORE, *supra* note 15, at 2, 10-13.

21. See Hauer et al., *supra* note 18, at 691.

22. FEMA SRLP Data, *supra* note 8.

23. *Id.*

24. *Id.*

25. *Id.*

26. Becky Hayat & Robert Moore, *Addressing Affordability and Long-Term Resiliency Through the National Flood Insurance Program*, 45 ELR 10338 (Apr. 2015), available at <https://is.gd/Sulnyh>.

27. “Substantial damage” is defined as damage exceeding 50% of the fair market value of the property. See also 42 U.S.C. §4014(a)(2)(E).

28. Premiums from the sale of flood insurance are deposited in the National Flood Insurance Fund, which is then used to pay damage claims. See also *id.* §4017.

The “discounts for buyouts” approach differs from FEMA’s current practice for purchasing properties in at least one important way: much of the work is done before a flood occurs, rather than months afterward. Under this proposal, the homeowner would have the option to lock in a guaranteed buyout before the next major flood occurs. This option would be available through a three-way agreement between the homeowner, FEMA, and the local community or state that would establish a minimum purchase price. FEMA would agree to provide funding to purchase the home through the NFIP, and the state or local community would be responsible for taking ownership of the property from the owner, demolishing the structure, and maintaining the resulting open space in the future. Key factors such as eligibility and initial valuation of the home would be established in advance of a flood. This buyout agreement would be documented on the deed for the property to ensure transparency and clarity.

This “discounts for buyouts” proposal is not intended to replace FEMA’s current mechanisms for supporting buyouts, but would complement those existing efforts by addressing barriers posed by long lag times and uncertainty in the existing buyout program. Currently, months may pass before a homeowner is even approached about having his or her property purchased. By that time, most affected homeowners have completed repairs and are no longer interested in moving. Even for those who are interested, years can go by before the local government receives funding from FEMA.²⁹ These delays create a race against the clock, leaving the homeowner to hope that the purchase will go through before another flood hits.

Moreover, not all interested homeowners are guaranteed that their homes will be purchased. Ultimately, the number of flood-prone homes purchased is dependent on the amount of funding, the number of homeowners interested in being bought out, and the number of owners who see the process through to the end. This combination of factors injects a huge amount of uncertainty.

The “discounts for buyouts” approach presents a potential win-win scenario, benefiting homeowners, the local government, and FEMA. For the homeowner, it helps avoid the scenario of filing a flood damage claim and repairing a home, only to be approached about a buyout months later and enduring a multi-year wait before knowing whether the property will be purchased. For the local government, securing agreements for purchasing properties in advance of the next flood allows it to plan for a future where fewer people live in flood-prone areas. For FEMA and the NFIP, they could more quickly and cost effectively eliminate the financial exposure of paying future damage claims on a property that has proven to be repeatedly susceptible to flood damage. Voluntary pre-flood agreements would help

expedite the actual purchase of the property after a flood damages a home, sparing both the owner and the community the years of uncertainty that are an unfortunate reality of traditional buyouts.³⁰

C. *Prioritization of Assistance to Low- and Middle-Income Families*

Under the approach recommended here, the NFIP should prioritize assistance to low- and middle-income families who live in areas at high risk of flooding now or in the future. Voluntary participation in the buyout program could be available to individuals meeting the following suggested criteria:

1. The homeowner has flood insurance, and the property is valued at less than \$250,000 (the maximum insurable value under the NFIP).
2. The owner is low- or middle-income (earns less than 120% of adjusted median income for the community).
3. The property has a history of being damaged in floods or is at a high risk of being flooded in the future.
4. The property is located in a community that supports and promotes efforts to help people relocate from flood-prone areas and is willing to take ownership.
5. FEMA determines that it would be cost effective to purchase the property, rather than have the NFIP continue to pay to rebuild.

The “discounts for buyouts” proposal would enable many low- and middle-income homeowners to move out of harm’s way, including those who currently cannot secure assistance to do so. As an added benefit, homeowners would qualify for lower flood insurance premiums and would be able to continue living in their community until their home is heavily damaged, triggering the buyout of the property that enables them to relocate. This reduced premium might also encourage more homeowners to sign up for coverage, addressing a critical challenge of underinsurance in the floodplain. In the NFIP flood zones, the insurance take-up rate is a mere 50% and far less outside these zones.³¹

29. Alex Greer & Sherri Brokopp Binder, *A Historical Assessment of Home Buyout Policy: Are We Learning or Just Failing?*, 27 HOUSING POL’Y DEBATE 372 (2016); SNOHOMISH COUNTY PUBLIC WORKS SURFACE WATER MANAGEMENT, WASHINGTON STATE EMERGENCY MANAGEMENT DIVISION, VOLUNTARY FLOODPLAIN HOME BUYOUT PROGRAM (2016), <https://snohomish-county.wa.gov/DocumentCenter/View/6345>.

30. Under this program, FEMA and the owner would have already settled on an approximate pre-flood purchase price and FEMA would have determined that purchasing the property would save the NFIP more money than paying repeated damage claims above a certain threshold. Once the property passes that threshold of damage, FEMA and the local community would immediately proceed with the purchase using NFIP funds. This would cut the time for buyouts dramatically, compared with the years-long process of FEMA’s laborious grants programs.

31. CENTER FOR INSURANCE POLICY AND RESEARCH, NATIONAL ASSOCIATION OF INSURANCE COMMISSIONERS, CIPR STUDY: FLOOD RISK AND INSURANCE 3 (2017), https://www.naic.org/documents/cipr_study_1704_flood_risk.pdf.

If such an option were made available to low- and middle-income owners of homes valued at less than \$250,000 who meet the criteria described above, NRDC estimated that the NFIP could help 0.51 to 1.59 million eligible families move out of areas vulnerable to sea-level rise. NRDC estimates indicate that acquiring all of these properties would cost from \$52 billion to \$163 billion between now and the end of the century, at an annual cost of about \$600 million to \$2.0 billion.³² Despite the substantial cost, purchasing this many properties would actually represent significant savings over the existing approach of “flood, rebuild, repeat.” NRDC estimates damages to the same pool of properties would be between \$72 billion and \$224 billion, or an annual cost of about \$900 million to \$2.76 billion.³³ Moreover, buyouts offer additional benefits to homeowners, who will be spared the trauma of ruined property and possessions, inability to go to work or school, exposure to mold, and other flood-related problems.

The above estimate assumes that all qualified owners will accept a buyout and relocate. Clearly, some property owners will not. The choice to sell a home and relocate is a challenging decision with multiple variables that could lead homeowners to choose to stay put. However, in many cases, homeowners want to break the cycle of flooding and rebuilding but are unable to afford to simply abandon their home and are unwilling or unable to sell it to the next unsuspecting buyer. A study by the University of Illinois found that 68% of floodplain property owners surveyed would consider signing up for a voluntary pre-flood buyout program.³⁴

III. Lowered and Cumulative Substantial Damage Thresholds

Buyouts will not be appropriate for all homes damaged by flooding, but communities can transition a broader category of existing structures out of the cycle of “flood, rebuild, repeat” by triggering them to come into compliance with previously adopted local building, zoning, and floodplain regulations. When buildings in the SFHA undergo repair or improvement, it creates an opportunity to reduce the vulnerability of individual structures to future flood damages. The NFIP requires participating communities to adopt a local substantial improvement/substantial damage (SI/SD) standard, which requires property owners making significant repairs to bring their structure into compliance with the community’s current building, zoning, and floodplain management requirements.³⁵ For example, the SI/SD

standard may require a structure to be elevated to the base flood elevation level, usually the height of a 100-year flood.

Currently, many communities adopt FEMA’s definition of “substantial damage” as damage of any origin sustained by a structure for which the cost of repairing the structure would equal or exceed 50% of the market value of the structure before the damage occurred.³⁶ The “substantial improvement” standard similarly applies for renovation or improvement work to a structure.³⁷ When the costs of an improvement or repair of damage to a structure surpass this threshold, the structure must be brought into compliance with current community floodplain management requirements. For example, if a home, located in the SFHA (1% annual chance floodplain) was built before the community joined the NFIP and it was damaged by 50% of its pre-damage market value, the home would most likely have to be elevated to, at a minimum, the base flood elevation.

The SI/SD requirement provides a critical lever to enhance resilience to climate change and break the cycle of sinking taxpayer dollars into repeatedly rebuilding and repairing the same vulnerable structures. It creates an opportunity to make communities stronger, safer, and smarter while reducing future damage costs. However, in practice, it has several limitations. First, the prevalence of SRL properties demonstrates buildings are repeatedly damaged by flooding events below the 50% threshold and rebuilt. Since the standard is not cumulative, meaning it requires a one-time event that surpasses the 50% to trigger compliance, it does not sum up these repeated repairs and potentially creates a perverse incentive to do multiple repairs over time to avoid exceeding the threshold with any single repair.

Second, it fails to incentivize increasing resilience to flooding of buildings that are heavily damaged, but below the somewhat arbitrary 50% damage threshold. For example, a lower threshold of 25% damage would more rapidly bring the existing housing stock up to code, decreasing vulnerability for future floods. Third, it creates an incentive to lowball damage estimates to help residents avoid the high costs of bringing structures into compliance with flood ordinances. An investigation by the *Houston Chronicle* indicates the intentional lowballing of damage estimates is pervasive nationwide.³⁸ The *Chronicle* examined claims records for more than 36,000 SRL properties, and found about 16% had “evidence of being substantially damaged—beyond the 50 percent threshold—at least once

32. See MOORE, *supra* note 15, app. 1, for a description of how these estimates were made.

33. *Id.*

34. Collin Reeser, Homeowner Willingness to Pay for a Pre-Flood Buyout Agreement 21 (2016) (M.S. thesis, University of Illinois at Urbana-Champaign).

35. 44 C.F.R. §60.3(a)-(c) (providing regulatory requirements for new construction and substantial improvement under the NFIP); see also FEMA, SUBSTANTIAL IMPROVEMENT/SUBSTANTIAL DAMAGE DESK REFERENCE (2010) (FEMA P-578), <https://perma.cc/UHK8-GXBZ>; Fact Sheet, FEMA, NFIP “Substantial Damage”—What Does It Mean? (Oct. 6, 2017) [hereinafter FEMA Fact Sheet] (offering alternative options to elevating a structure, in-

cluding demolishing or relocating a residential structure or floodproofing a nonresidential structure), available at <https://perma.cc/2B69-F4DU>.

36. See 44 C.F.R. §59.1 (defining “substantial damage” as “damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred”).

37. *Id.* (defining “substantial improvement” to apply for “any reconstruction, rehabilitation, addition, or other improvement of a structure” for which the estimated cost equals or exceeds 50% of the market value of the structure prior to “start of construction” of the improvement).

38. Mark Collette, *Flood Games: Manipulation of Flood Insurance Leads to Repeat Disasters*, HOUSTON CHRON., July 5, 2018, <https://www.houstonchronicle.com/business/article/Flood-Games-How-victims-local-officials-and-an-13031069.php>.

before flooding again.”³⁹ Lax enforcement of the SD standard and its correlation to repeated flooding has been recognized for more than 20 years as a major shortcoming of the NFIP.⁴⁰

A. Lower Flood Insurance Premiums for Communities With More Rigorous SI/SD Standards

The NFIP provides a mechanism to incentivize communities to take on more rigorous SI/SD standards to ensure better flood protection. Communities with stronger flood protection regulations than those mandated by the NFIP can join the NFIP’s Community Rating System (CRS) and receive a discount on flood insurance premiums for their residents. Communities receive credit points for the different activities they take to reduce flood losses. Based on their score classification, communities can receive up to 45% off flood insurance premiums for residents in their communities.⁴¹ As of 2017, nearly 3.6 million policyholders in 1,444 communities participated in the CRS.⁴² Of the more than 22,000 communities participating in the NFIP, only 5% participate in the CRS program, but more than 69% of all flood insurance policies are written in CRS communities.⁴³

The CRS program principally rewards higher regulatory standards for floodplain development, including two reforms for stronger SI/SD standards. The first option is a “cumulative substantial improvement” (CSI) standard under which all improvements or repairs during a certain period of time are counted cumulatively toward the SI requirement. This prevents owners from undertaking many small repairs over time that eventually would add up to a larger repair. For example, this standard may count all repairs from major flood events over a 10-year period cumulatively toward a 50% threshold of SD. The second option is a “lower substantial improvement” (LSI) standard, which uses a threshold lower than 50% of the building’s value to determine when the SI requirement takes effect. For example, it might trigger requirements to elevate or make buildings more flood resilient if a flood causes damages that equal or are greater than 25% of the pre-damage market value.

Among the 1,444 communities participating in the CRS program, roughly one-third receive points for taking some action toward instituting a more rigorous cumula-

tive or lower threshold SI or SD standard.⁴⁴ Among these communities, ISO Community Hazard Mitigation, the consulting company employed to manage the NFIP data set, identifies at least 309 communities receiving CSI credit for a cumulative SI or SD standard with at least a 10-year tracking requirement and at least 90 communities receiving credit for at least a five-year tracking requirement (see Table 1).⁴⁵ Collectively, these communities represent roughly one-quarter of CRS communities (399 of 1,444, or 27.6%), and a much smaller percentage of communities participating in the wider NFIP.⁴⁶

Even fewer communities utilize a threshold below 50% of market value for measuring SD or SI. FEMA data identify 25 communities receiving credit for LSI1, which requires a less than 50% threshold, and 32 communities receiving credit for LSI2, with a regulatory threshold that is no more than 25% of the square footage of the building’s lowest floor.⁴⁷

B. State Model Flood Ordinances

The low penetration of communities with higher SI/SD standards in the NFIP indicates an opportunity to increase

44. FEMA, 2007 and 2013 CSI and LSI Communities Data, E-Mails from David Arkens, ISO/CRS Technical Coordinator, ISO Community Hazard Mitigation, to Joel Scata, Attorney, NRDC (June-Oct. 2018) [hereinafter FEMA CSI and LSI Data] (on file with authors). These datasheets were obtained via e-mail from David Arkens on August 20, 2018. The data are the most recent from FEMA based on their 2007 and 2013 manuals listing all CRS communities that received points toward CSI or LSI standards for those years. The datasheets showed 522 of 1,433 communities received points.

45. ISO CRS SI/SD Standards Data, E-Mails from David Arkens, ISO/CRS Technical Coordinator, ISO Community Hazard Mitigation, to Joel Scata, Attorney, NRDC (June-Oct. 2018) (on file with authors). ISO Community Hazard Mitigation maintains CRS data for FEMA and these estimates are based on their most current spreadsheets, which are based on data from the 2007 and 2013 FEMA manuals, but with a further level of detail than the FEMA CSI and LSI data sheets that he was able to provide to us. David Arkens reported 134 communities with a 10-year CSI requirement, 121 communities with a 10-year cumulative SD requirement from their 2013 data, and an additional 175 communities with a 10-year CSI or cumulative SD requirement from the 2007 data. Mr. Arkens confirmed the 2007 communities did not overlap with the 2013 communities.

To estimate communities with a 10-year cumulative tracking requirement, we combined the 134 “2013 communities” with an SI standard with the 175 “2007 communities.” This may result in a lower estimate of communities because some additional 2013 communities may have an SD standard without an SI standard, but as SI is frequently defined to include SD, this approach avoids a high level of potential overlap between the 2013 SI and SD communities.

The same approach was used for calculating communities with a five-year cumulative standard. The data received on communities with a five-year standard were 80 communities with a five-year CSI requirement in the 2013 manual, 66 communities with a five-year cumulative SD requirement in the 2013 manual, and 10 communities with a five-year CSI or cumulative SD requirement in the 2007 manual.

46. While additional non-CRS communities have adopted cumulative standards, there is no recordkeeping to track what percentage of these communities have adopted higher standards. We assume that adoption of cumulative standards would be much less frequent in non-CRS communities than CRS communities. However, a floodplain manager from Illinois reports that there are many non-CRS communities in Illinois that have adopted the cumulative standard. See E-Mail from Paul Osman, Chief, Statewide Floodplain Programs, Illinois Office of Water Resources, to Joel Scata, Attorney, NRDC (Dec. 10, 2018, 1:39 CST) (on file with the authors).

47. *Id.*

39. *Id.*

40. DAVID CONRAD ET AL., NATIONAL WILDLIFE FEDERATION, HIGHER GROUND: A REPORT ON VOLUNTARY PROPERTY BUYOUTS IN THE NATION’S FLOODPLAINS, A COMMON GROUND SOLUTION SERVING PEOPLE AT RISK, TAXPAYERS, AND THE ENVIRONMENT (1998) (stating “that large numbers of substantially damaged properties have apparently not been elevated or removed as required, and substantial damage requirements have often not been enforced in many communities”), available at <https://perma.cc/3AMV-EQ35>.

41. FEMA, CRS CREDIT FOR HIGHER REGULATORY STANDARDS 1 (2006), available at <https://perma.cc/EM77-YAHT>.

42. Fact Sheet, FEMA, Community Rating System (2017), available at <https://perma.cc/DW5Q-VNMH>.

43. *Id.*

Table I. CRS Communities With a Cumulative SD and/or SI Standard (2007 and 2013 Data)

Standard	Number of Communities Receiving CRS Credit for Standard	Percent of CRS Communities Receiving CRS Credit for Standard
10-Year Tracking Requirement	309	21.4%
5-Year Tracking Requirement	90	6.2%
Total	399	27.6%

Source: ISO CRS SI/SD Standards Data, E-mails From David Arkens, ISO/CRS Technical Coordinator, ISO Community Hazard Mitigation, to Joel Scata, Attorney, NRDC (June-Oct. 2018) (on file with authors).

the resilience of communities to flooding and the adaptability of the NFIP through wider adoption. While communities must individually choose to adopt higher standards, states can help promote greater adoption of more stringent standards through a variety of mechanisms. Many states have model flood ordinances that communities can adopt.⁴⁸ Several states have multiple ordinances that are tailored to meet the respective needs of communities with different zones from the flood maps.⁴⁹ Others distinguish between riverine or coastal communities.⁵⁰ Some states have separate ordinances with higher standards for CRS communities.⁵¹ In addition to model ordinances, states may also provide regulatory language for SI/SD standards through building codes, other flood regulations, quick guides, desk references, or strategic plans.

We surveyed state model flood ordinances and related documents to assess how frequently these documents endorse standard NFIP requirements for SI/SD versus how frequently they provide models for a higher standard (see Table 2). Of 50 states surveyed, we were able to obtain and review ordinances or other regulations containing SI/SD standards for 39 states.⁵² Roughly one-half of these ordinances provided only the standard FEMA definition for

SD. Another 12 provided the standard FEMA definition, but also suggested optional text for more stringent requirements in at least one of their ordinances. It is worth noting that additional states outline options for more protective requirements in instruction documents or guidance associated with their ordinances. Only eight states utilize a more stringent definition of SD or SI as the default text of their ordinances, rather than optional, additional text.

C. Benefits and Challenges

Community adoption of an SI/SD standard to calculate damages cumulatively over time and to be triggered for damages and repair work worth less than 50% of the fair market value of the structure can help the NFIP better weather a changing climate, lessen the taxpayer burden, and increase the safety of millions of homeowners. Through model flood ordinances, building codes, other regulations, and guidance, states have several mechanisms to encourage municipalities and counties to adopt these more protective standards. Communities will yield three primary benefits from adoption of such standards.⁵³

1. Communities can better protect people and property by bringing older housing stock into current floodplain management requirements more expediently.
2. Adoption of a certain cumulative threshold meets Increased Cost of Compliance (ICC) coverage requirements, a program that may provide up to \$30,000 to help cover the cost of flood mitigation measures, like elevation of the home.⁵⁴

48. State-level model ordinances are dependent on municipal-level authorities to adopt the relevant standards. In certain states, legal authority to adopt these standards must be delegated to municipalities. Municipalities and counties should carefully review their local authorities before adopting any standards.

49. See, e.g., State of Delaware, *Shoreline & Waterway Management—Ordinance Revision Resources*, <https://perma.cc/9R6N-KBNB> (last visited Oct. 16, 2018).

50. See, e.g., Alabama Department of Economic and Community Affairs, Office of Water Resources, *NFIP Community Participation Resources* (linking to respective model flood ordinances for coastal and riverine communities), <https://perma.cc/MS9R-FFC4> (last visited Oct. 16, 2018).

51. See, e.g., Idaho's Flood Damage Prevention Ordinance—Idaho Model Ordinance for CRS Communities, E-Mail from Maureen O'Shea, State NFIP Coordinator, Idaho Department of Water Resources (Sept. 19, 2018) (on file with authors).

52. For states without ordinances available online, we contacted state agencies responsible for floodplain management to obtain copies of any existing ordinances. In cases where an ordinance was subsequently provided, we included those in our data set. Twelve states either did not have an ordinance or did not have an ordinance available online and did not respond to our queries to provide a copy. Of the remaining 38 states, we included a building code for Michigan and the Hawaii county ordinances, which are where those states use the FEMA definitions of SD and SI.

53. For further discussion of these benefits, see DENA ADLER & JOEL SCATA, *BREAKING THE CYCLE OF "FLOOD-REBUILD-REPEAT": LOCAL AND STATE OPTIONS TO IMPROVE SUBSTANTIAL DAMAGE AND IMPROVEMENT STANDARDS IN THE NATIONAL FLOOD INSURANCE PROGRAM 14-17* (2019), <https://perma.cc/B9Z6-HEZB>.

54. To be eligible for ICC coverage, an NFIP policyholder must suffer a flood loss and be declared "substantially damaged" or "repetitively damaged." To receive ICC coverage for the latter, the community must adopt and uniformly enforce a repetitive loss provision or a cumulative substantial damage provision in its floodplain management laws or regulations. FEMA defines "qualifying repetitive damage" as damage where "[t]he cost to repair the

Table 2. SI/SD Standards in State Model Flood Ordinances	
Total States for Which Model Flood Ordinance or Similar Document Reviewed*	39
Ordinances Using Standard FEMA Definition of SD/SI	19
Ordinances With Optional Language for a Cumulative Damage Standard	12
Ordinances With Optional Language for a Lower Threshold Damage Standard	4
Ordinances With Primary Definition of SI or SD as a Cumulative Standard	8
Ordinances With Primary Definition of SI or SD as a Lower Threshold Standard	0

* The remaining 11 states either (1) did not have a model flood ordinance or (2) did not have an ordinance publicly available online and officials did not respond to requests to provide a copy of the ordinances.

3. Communities can receive CRS credit, which will help communities attain a higher CRS ranking and, thus, reduced insurance costs for their residents.

Nevertheless, in effectively raising the SI/SD standard challenges arise related to tracking, financing, and equity. Several strategies can mitigate these challenges. First, states should introduce disclosure laws that track expenditures for repairs and damages over time so that new owners are aware of their property's history. Since damages and improvements to a structure carry with the property during a transfer of ownership, disclosure laws that track cumulative improvements and damage would help protect prospective homeowners from expensive surprises. Without such disclosure laws, homeowners could unknow-

ingly purchase a property that is close to the threshold, and then due to a small improvement or repair may cross that threshold and be obligated to bring the entire structure into compliance with the community's floodplain management requirements.⁵⁵ As ICC coverage is only available for flood-related damage that satisfies FEMA's repeatedly flooded damage requirements, the new homeowner could be burdened by a substantial expense.

Second, ICC coverage may not be adequate to assist with all required mitigation measures due to the SI/SD threshold being triggered.⁵⁶ High flood-risk communities may consider innovative supplemental financing mechanisms such as purchasing parametric insurance and catastrophe bonds. Parametric insurance is a risk transfer arrangement that, unlike indemnity insurance, does not indemnify one for the full loss caused by a disaster event.⁵⁷ Instead, a purchaser of parametric insurance buys a pre-defined amount of protection that pays out according to an agreed-upon triggering event.⁵⁸ An example would be a parametric insurance policy that pays out \$10 million if a 0.2% annual chance flood occurs. Parametric insurance can greatly increase the speed of payout and eliminate disputes over the amount of the payout because these policies do not require a claims adjustment process,⁵⁹ but instead rely on objective, independently collected data.⁶⁰

The parametric trigger is also utilized in catastrophe bonds or "cat bonds." Such bonds create risk-linked securities that transfer the risk of a specified event occurring—like a certain category hurricane in a particular city—from an issuer or sponsor to investors. If the qualifying event occurs, then the investors lose some or all of their principal and the issuer receives that money to cover its anticipated losses.⁶¹ Catastrophe bonds with a parametric trigger may be a more attractive alternative than a stand-alone parametric insurance policy, as the cost of coverage may be less as the insurance provider transfers the risks to capital mar-

55. Telephone Interview with Paul Osman, Chief, Statewide Floodplain Programs, Illinois Office of Water Resources (Sept. 10, 2018) (Paul Osman has experienced three to four cases where a home was sold with accumulated 40% to 49% improvement and damage costs, and the buyer was unaware until they triggered the provision due to a small-scale project).

56. Costs to raise a house are highly variable, but consistently estimated to be above the ICC cap. See, e.g., WHARTON CENTER FOR RISK MANAGEMENT AND DECISION PROCESSES, POST-FLOOD MITIGATION: THE NFIP'S INCREASED COST OF COMPLIANCE (ICC) COVERAGE 4 (2017) (estimating that home elevation can cost three to five times the ICC cap), <https://risk-center.wharton.upenn.edu/wp-content/uploads/2017/11/WRCib2017c-NFIP%E2%80%99s-Increased-Cost-of-Compliance-Coverage.pdf>; see also ImproveNet, *How Much Will It Cost to Raise a House Foundation?* (estimating the average cost to elevate a home is between \$30,000 and \$100,000), <https://perma.cc/WX3P-297M> (last updated Oct. 5, 2018).

57. National Association of Insurance Commissioners, Center for Insurance Policy and Research, *Parametric Disaster Insurance*, <https://perma.cc/L6EF-765S> (last updated July 25, 2018).

58. *Id.* (parametric insurance is not affiliated with the NFIP).

59. *Id.*

60. *Id.*

61. Nathaniel Bullard, *Blockchain Used as Settlement Mechanism for Cat Bond With Parametric Trigger*, INS. J., Aug. 14, 2017, at 9, <https://perma.cc/6KJK-GT3Y>. See also RE.BOUND PROGRAM, LEVERAGING CATASTROPHE BONDS AS A MECHANISM FOR RESILIENT INFRASTRUCTURE PROJECT FINANCE (2015), <https://perma.cc/C6QN-8R5R>.

While ICC coverage previously required flood-related damage to equal or exceed 50% of the market value for the structure, FEMA has authorized ICC coverage if a community has adopted a lower threshold. FEMA, National Flood Insurance Program Policy Issuance No. 01-2011, at 2 (2011) (stating that ICC claims are authorized for an SD threshold that has been adopted and uniformly enforced by the community that may be lower than 50%), <https://perma.cc/UP4U-MHG2>.

kets.⁶² A community could potentially sponsor a parametric cat bond designed to be triggered by a flood event likely to substantially damage homes and the payouts could be used by those homeowners to achieve compliance with floodplain regulations.

Third, the disproportionate effect of flooding on vulnerable and low-income communities must be acknowledged and mediated. Overall, the NFIP faces a number of equity challenges. While disasters do not themselves discriminate, a history of discriminatory policies like redlining and segregation, as well as economic and social disparities, have located low-income communities and communities of color in highly vulnerable floodplains in certain states.⁶³ Socially vulnerable communities were some of those most heavily impacted by flooding after Hurricane Harvey.⁶⁴ These vulnerable communities include the elderly, disabled, poor, and those who do not own a car or cannot speak English.

For several reasons, low-value homes are more likely to be assessed as substantially damaged.⁶⁵ First, an equivalent dollar value of damage (e.g., \$55,000) would trigger the 50% SI/SD threshold in a home worth \$100,000, but not a home worth more than \$110,000. Further, low-value homes may be more likely to be more significantly damaged due to location in vulnerable areas, poor construction, or construction under outdated building codes.⁶⁶ At least one study found that officials were more likely to subjectively assess homes in low-income neighborhoods to be substantially damaged than in high-income neighborhoods.⁶⁷ Our proposed changes to the SI/SD standards would likely increase the number of homes assessed as substantially damaged, making it important to bundle these standards with other reforms to financially assist low-income and vulnerable communities in bringing their homes into compliance with local floodplain regulations.

IV. Increase Transparency of Flood-Related Risks

Adequate information about flood risk plays an essential role in identifying properties that can best be served by flood reform programs, like those summarized earlier in this Comment, and enabling property owners and buyers to make informed decisions. Unfortunately, the NFIP is a relatively opaque program with regard to the availability of information on flood damages, number and cost of policies, information on repeatedly flooded properties, costs of the program to the nation, and the level of enforcement by participating communities. Individual homeowners, the public, researchers, local officials, and even members of Congress do not have ready access to basic information that should be publicly available.

This lack of transparency inhibits communities, developers, and prospective homeowners from making informed decisions about flood risk. It further prevents development of informed reforms to the NFIP or complementary state- and local-level policies. Legislative reform at both the federal and state levels can increase transparency of flood-related risks.

A. Federal Transparency Solutions for Flood-Related Risk Disclosures

At the federal level, several legislative reforms could directly improve transparency within the NFIP, including a pair of “right-to-know” provisions and other measures to enhance disclosure and mandatory identification of most vulnerable areas. First, a “homeowner right-to-know” provision could provide all homeowners the right to obtain their property’s history of NFIP claim payments and flood damages, including under previous owners, from FEMA. The greater access to information about a property’s flood risk could spur mitigation actions, thus reducing the fiscal exposure of the program. Shockingly, FEMA will not provide this information to a homeowner upon request, unless the homeowner already has purchased an NFIP policy. This denies homeowners access to critical information that could help them determine whether they should purchase an NFIP policy.

Second, a “public right-to-know” provision could direct FEMA to create a public, open-data system to share information related to a community’s or region’s flood risk, such as current and historical policy information, the total number of multiple-loss properties in a community, and whether a community was in compliance with the NFIP. This would provide information on repeatedly flooded homes and areas with high numbers of such homes, as well as information on outstanding compliance issues in local communities, that would strengthen future reform efforts.

Third, a set of national real property disclosure requirements for sellers and lessors could ensure homebuyers make informed purchases, cognizant of past flood damages, flood risks, and flood insurance obligations that might run

62. Michael Edesess, *Catastrophe Bonds: An Important New Financial Instrument*, 4(3) ALTERNATIVE INVESTMENT ANALYST REV. 6 (2015), available at <https://caia.org/aiar/1957>.

63. See, e.g., Tanvi Misra, *The Ugly Story of South Dallas*, CITYLAB, May 11, 2016, <https://www.citylab.com/equity/2016/05/the-ugly-story-of-south-dallas/482283/>; Marilyn C. Montgomery & Jayajit Chakraborty, *Assessing the Environmental Justice Consequences of Flood Risk: A Case Study in Miami, Florida*, 10 ENVTL. RES. LETTERS (2015), available at <https://doi.org/10.1088/1748-9326/10/9/095010>. For some of the difficulties in analyzing these trends at the national level, see NYU FURMAN CENTER, DATA BRIEF: POPULATION IN THE U.S. FLOODPLAINS (2017), http://furmancenter.org/files/Floodplain_PopulationBrief_12DEC2017.pdf.

64. Jeremy Deaton, *Hurricane Harvey Hit Low-Income Communities Hardest*, THINKPROGRESS, Sept. 1, 2017, <https://thinkprogress.org/hurricane-harvey-hit-low-income-communities-hardest-6d13506b7e60/>.

65. Anne Siders, *Social Justice Implications of U.S. Managed Retreat Buyout Programs*, 152 CLIMATIC CHANGE 239 (2019), available at <https://link.springer.com/article/10.1007/s10584-018-2272-5>.

66. SUBSTANCE ABUSE AND MENTAL HEALTH SERVICES ADMINISTRATION, GREATER IMPACT: HOW DISASTERS AFFECT PEOPLE OF LOW SOCIOECONOMIC STATUS (2017), <https://perma.cc/2KP2-74VK>.

67. Daniel H. de Vries & James C. Fraser, *Citizenship Rights and Voluntary Decision Making in Post-Disaster U.S. Floodplain Buyout Mitigation Programs*, 30 INT’L J. MASS EMERGENCIES & DISASTERS 1-33 (2012), available at <https://perma.cc/PD98-DPGG>.

with a property. A set of national disclosure requirements would require sellers or lessors of a house to disclose past flood damages to potential buyers and lessees prior to the purchase or leasing of the property. This proposal would have an impact nationwide as states would be required to enact sufficient flood disclosure laws in order to remain in the NFIP. These disclosures could also be enacted individually by states, as discussed below. In either case, they would allow buyers to make informed choices during one of their most important financial decisions.

Fourth, NFIP-participating communities could be required to identify their most vulnerable areas and develop plans to mitigate risks to those areas. This information could help communities determine how best to utilize their resources to help individual homeowners increase resilience in place or determine if coordinated relocation might be an option. All of the above provisions were included in federal legislation recently considered by Congress. Indeed, the U.S. House of Representatives passed a bill (H.R. 2874) containing these provisions in November 2017.⁶⁸ However, none of these provisions have yet been passed into law because the U.S. Senate failed to vote on the bill.⁶⁹ As the legislation was introduced during the 115th Congress, new versions of the proposals will need to be drafted and introduced in both the House and Senate.

B. State-Level Solutions for Seller Disclosure of Flood-Related Risks

To fill the federal gap, states can also directly increase transparency by establishing or improving their regulatory or statutory requirements for sellers to disclose flood-related risks before closing. Such disclosures can include whether a property is in a floodplain, a property's history of flood damages, and any requirements to carry flood insurance for the property. Without such requirements, many homeowners may never learn their home is vulnerable to flooding until after they find their home quite literally underwater—a risk increased by sea-level rise and more frequent and intense extreme weather events. Ironically, this information may be readily available either from the seller or from FEMA, which keeps a record of flooding in all properties that receive insurance through its NFIP.

Our review of all 50 states' disclosure laws found room for improvement in the majority of states' policies (see Figure 1).⁷⁰ Twenty-one states lack statutory or regulatory requirements for sellers to disclose a property's history of flood damages or other factors related to flood risk. Many of these states have private realtor associations that provide voluntary disclosure forms referencing potential flood haz-

ards, but these were not counted since they are not mandatory requirements. The other 29 states, plus Washington, D.C., at a minimum, require sellers to disclose whether the property is in a designated floodplain before the point of sale. Of these, only 10 states additionally require disclosure of whether there have been any flood damages to structures on the property.

Even in states with minimum disclosure requirements, loopholes can undermine their effectiveness. For example, though New York's disclosure statute technically prompts a seller to disclose whether the property is located in a designated floodplain, the seller can check a box that this information is unknown.⁷¹ Further, a seller can avoid even this disclosure requirement by paying a \$500 fee at closing. More broadly, among the 29 states, plus Washington, D.C., with disclosure requirements related to flood risk or damages, at least 26 have various exemptions for property transfers related to foreclosures and/or deed transfers in lieu of foreclosures—that is more than 85% of states with flood-related disclosures.⁷²

Inadequate disclosure laws have real consequences in a world where flooding is an ever-growing risk for many communities. In 2017, more than 95,000 NFIP policyholders⁷³ submitted claims to FEMA for about \$8.7 billion in damages—the third highest damages payout since 1978.⁷⁴ The top three most expensive claim years have all occurred within the past 15 years.⁷⁵ State adoption of mandatory seller disclosure of flood risks would help ensure homeowners have the necessary information when making one of their largest financial investments and more broadly help break the cycle of investment in properties increasingly vulnerable to flooding. In the absence of federal action, states can also amend their laws to require sellers to disclose these critical pieces of information.

V. Improve Disclosure of Community Compliance Data and Resources for Enforcement of the NFIP

Even the most stringent local floodplain regulations are only as beneficial as their implementation. Academic research,⁷⁶ FEMA-commissioned reports,⁷⁷ independent

68. H.R. 2874, 115th Cong. (2017) (homeowner right to know, §108; public right to know, §204; seller's disclosure, §109; identification of vulnerable areas, §402).

69. See Congress.gov, *H.R.2874—21st Flood Reform Act: Actions* (showing no action after the bill was referred to the Senate), <https://www.congress.gov/bill/115th-congress/house-bill/2874/actions> (last visited Feb. 18, 2019).

70. NRDC, *How States Stack Up on Flood Disclosure*, <https://www.nrdc.org/flood-disclosure-map> (last visited Feb. 18, 2019).

71. See New York Real Property Law §462 (2002) (requiring all sellers of residential real property in New York to fill out and sign a "property condition disclosure statement" form and deliver it to the buyer or buyer's agent prior to the sale).

72. Dena Adler, *Foreclosure Exemptions to State Flood Risk Disclosure Requirements Sheet*, COLUM. L. SCH. SABIN CENTER FOR CLIMATE CHANGE L., Aug. 16, 2018, <https://bit.ly/2X0rnwO>.

73. FEMA, *Number of Losses Paid by Calendar Year*, <https://www.fema.gov/number-losses-paid-calendar-year> (last updated Jan. 30, 2019).

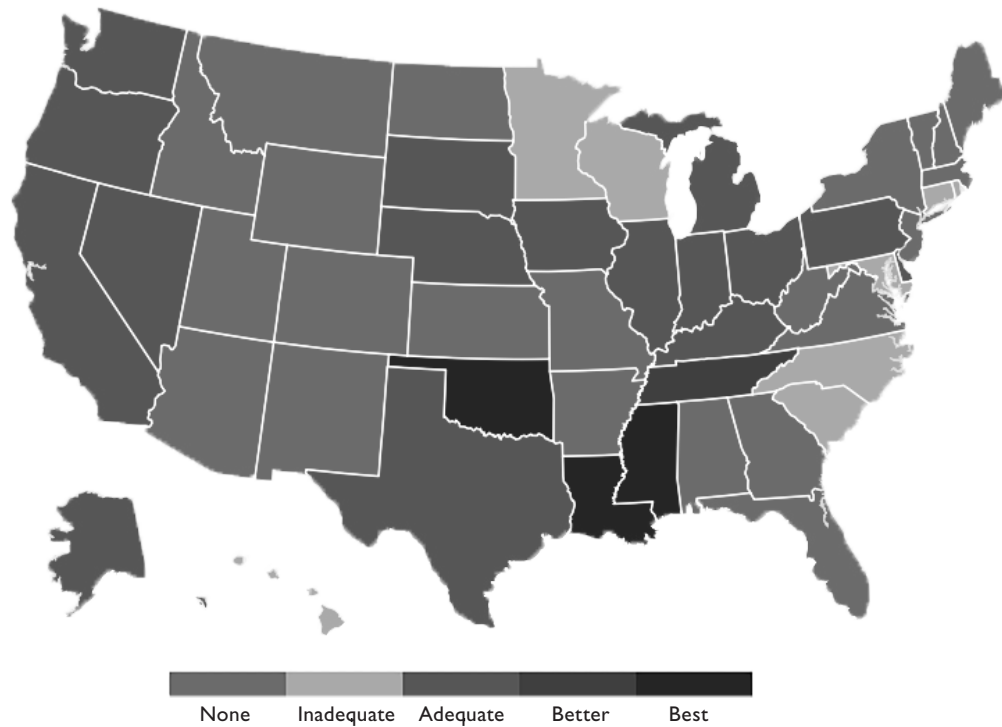
74. *Id.*

75. *Id.*

76. See generally Oliver Houck, *Rising Water: The National Flood Insurance Program and Louisiana*, 60 TUL. L. REV. 61 (1985) (analyzing the problem of NFIP enforcement in Louisiana).

77. See generally JACQUELYN MONDAY ET AL., AMERICAN INSTITUTES FOR RESEARCH, AN EVALUATION OF COMPLIANCE WITH THE NATIONAL FLOOD INSURANCE PROGRAM PART A: ACHIEVING COMMUNITY COMPLIANCE xxi (2006) (conducting a comprehensive evaluation of community compli-

Figure 1. Flood Risk Disclosure Laws (as of June 2018)



Disclosure Grade	
States are graded on a scale of A to F corresponding to the quality of the state’s flood hazard disclosure law (i.e., the level of flood hazard information required to be disclosed). States with a grade of F have no statutory or regulatory requirements for a seller to disclose a property’s flood risks or past flood damages to a potential buyer. However, many of these states have private realtor associations that provide voluntary disclosure forms referencing potential flood hazards. States with grades of A to D have statutory or regulatory real estate disclosure provisions that mandate a seller disclose to a potential buyer flood hazard information associated with the property.	
Grade A (Best)	Requires disclosure of whether the property is in a designated floodplain, whether there have been any flood damages to structures on the property, and whether there is any requirement to carry flood insurance. Also requires additional disclosures, such as the cost of flood insurance or an elevation certificate.
Grade B (Better)	Requires disclosure of whether the property is in a designated floodplain, whether there have been any flood damages to structures on the property, and whether there is any requirement to carry flood insurance.
Grade C (Adequate)	Requires only the disclosure of whether the property is in a designated floodplain and whether there have been any flood damages to structures on the property. Fails to require disclosure of whether flood insurance is mandatory. While some states require disclosure of whether flood insurance is maintained on a property, this provision fails to address a situation in which the current owner does not carry flood insurance even though such insurance is required, for instance, due to receipt of federal disaster aid.
Grade D (Inadequate)	Requires only the disclosure of whether the property is—before point of sale—in a designated floodplain. Fails to require disclosure of any flood damages to structures on the property or disclosure of any requirement to carry flood insurance.
Grade F (None)	No statutory or regulatory requirements for a seller to disclose a property’s flood risks or past flood damages to a potential buyer.

Source: NRDC in collaboration with the Sabin Center for Climate Change Law.

investigations,⁷⁸ and surveys of state and local floodplain managers⁷⁹ indicate the existence of compliance and enforcement challenges that undermine the NFIP's effectiveness. When communities fail to adequately adopt and enforce NFIP building and land use standards, people and property are put at risk, costing the NFIP and the federal government avoidable expenses.⁸⁰ Unfortunately, disclosure and transparency of community compliance data by FEMA is minimal, making a current and comprehensive assessment of the extent and particular challenges of non-compliance difficult. As climate change continues to exacerbate flooding nationwide, ensuring adequate compliance with and enforcement of the NFIP will become increasingly important to minimize unnecessary flood damage.

Failure to check risky development in the floodplain has two primary layers. The first concerns compliance—whether local communities adopt and enforce the building, zoning, and other floodplain development regulations to meet the requirements of participating in the NFIP. The second involves FEMA's willingness to take enforcement action by putting noncompliant communities on probation or suspending them from the NFIP if they fail to correct their violation. FEMA has taken limited probation or suspension enforcement action against noncompliant communities,⁸¹ even when recommended to do so by state coordinating agencies.⁸² Even while reserving probation and suspension as tools of last resort, FEMA can operate other solutions within its “cooperative enforcement” model to increase community compliance with the NFIP through greater provision of financial and training resources for states and local communities and improved monitoring, tracking, and transparency of information regarding community compliance.

This part sets up the case for ramping up these cooperative strategies by piecing together the limited information on community compliance and FEMA enforcement to illuminate the existence of a compliance problem. Greater

reporting, transparency, and resources to address barriers to implementation can help the NFIP better weather climate-related flooding risks.

A. *Limited Information on Community Compliance*

Under the NFIP, communities are considered noncompliant when they fail to adopt or enforce the minimum floodplain management criteria contained in 44 C.F.R. §60.3.⁸³ In general, these criteria include requirements for communities to limit development in the floodplain and ensure that the development and rebuilding that occurs is done in a manner to minimize flood risk. It is currently difficult to assess whether these criteria are adequately implemented by communities because FEMA has never stated what it considers an “optimal level of compliance” for the NFIP,⁸⁴ and NFIP compliance data are not comprehensive or reliable.⁸⁵

The best publicly available information appears to be a 2006 FEMA-commissioned report that estimates that the nationwide rate of community compliance with NFIP standards is 70% to 85%.⁸⁶ However, given the lack of tracking and reporting on community compliance, this estimate was inferred in part from the percentage of communities audited by FEMA for which either (1) no violations or deficiencies were found in the program, or (2) any compliance issues were addressed satisfactorily and the audit process was completed within two years. The report posited that one of the best available indicators of the number of communities with serious compliance problems are communities that have an audit held open for longer than two years, indicating either FEMA or the state coordinating agency had identified compliance problems that were not resolved. Per the report, that number was about 30% of all audits conducted over a five-year period for which records were analyzed.

Though the 2006 report is now more than a decade old, independent news investigations indicate that compliance levels continue to be a problem. Though FEMA recommends a community be audited every five years, a 2017 Reuters investigation found “only 23 percent of the more than 22,000 communities that participate in the flood insurance program had an audit by federal or state floodplain-management authorities in the eight years ending in 2016.”⁸⁷ Per the report, Reuters obtained documents from FEMA that summarized 6,253 audits between 2009 and 2016 in all 50 states. Auditors identified serious compliance issues in 13% of those visits, which included more than 100 communities with audits that remained open after three years.⁸⁸

The *Houston Chronicle* also conducted a study of FEMA data revealing that floodplain management officials in

ance); see also ELLIOTT MITTLER ET AL., AMERICAN INSTITUTES FOR RESEARCH, STATE ROLES AND RESPONSIBILITIES IN THE NATIONAL FLOOD INSURANCE PROGRAM 52 (2006), noting,

regarding remedying violations, some FEMA Region IX staff perceive difficulty enlisting the support of headquarters to suspend a community. This perception, whether real or just suspected, may deter regional staff from conducting mandatory extensive follow-up on major violations because they are not convinced that enforcement actions will ultimately be imposed.

78. See Collette, *supra* note 38; see also Benjamin Lesser & Ryan McNeill, *Unfettered Building, Scant Oversight Add to Cost of Hurricanes in U.S.*, REUTERS, Dec. 12, 2017, <https://www.reuters.com/investigates/special-report/usa-flooding-insurance/>.

79. ASSOCIATION OF STATE FLOODPLAIN MANAGERS (ASFPM), FLOODPLAIN MANAGEMENT 2017: STATE PROGRAMS (2017), available at <https://www.floodsciencecenter.org/projects/floodplain-management-state-programs-update-2017/>; see also SHERRI BROKOPP BINDER ET AL., FLOODPLAIN COMPLIANCE STUDY (2018) [hereinafter BROKOPP BINDER SURVEY] (unpublished report on state and local NFIP compliance prepared for the NRDC) (on file with authors).

80. See MONDAY ET AL., *supra* note 77, at 6.

81. 2007 NFIP Compliance Actions—The Cycle of Probation, Remediation, and Reinstatement, INSIDER (Association of State Floodplain Managers), Mar. 2008, at 7-8, available at https://www.floods.org/ace-files/newsletter/Insider_Mar_08.pdf.

82. See BROKOPP BINDER SURVEY, *supra* note 79, at 22.

83. FEMA, NATIONAL FLOOD INSURANCE PROGRAM COMMUNITY COMPLIANCE PROGRAM GUIDANCE vii (2014) (FEMA P-1022).

84. MONDAY ET AL., *supra* note 77, at 25.

85. *Id.* at iv-x.

86. *Id.* at x.

87. See Lesser & McNeill, *supra* note 78.

88. *Id.*

Texas were failing to enforce the NFIP's SD requirement.⁸⁹ The *Chronicle* examined the damage assessments for thousands of properties flooded by Hurricane Ike, the majority of which were not declared to be substantially damaged, despite being inundated at a depth that FEMA and the U.S. Army Corps of Engineers consider to cause major damage.⁹⁰

B. Potential Under-Enforcement of Violations by FEMA

Despite indications of significant compliance issues, available data sources suggest FEMA applies probation and suspension sparingly. A level of restraint in applying these mechanisms makes logical sense. FEMA employs probation and suspension as tools of last resort, preferring to help communities achieve compliance and remain eligible for the NFIP. However, compliance and enforcement research has found that “the presence of a credible threat of a penalty is useful and perhaps even necessary to achieve the highest level of possible compliance.”⁹¹

The 2006 FEMA-commissioned report noted that for the few times FEMA has formally threatened and/or imposed probation, compliance has been achieved in 85% of cases.⁹² However, the same report noted there is a “widespread perception” among FEMA and state staff (“and perhaps amongst communities”) that FEMA is unlikely to impose sanctions against communities in direct violation of the program.⁹³ A lack of credibility concerning proper enforcement can encourage “bad actors,” which jeopardizes the flood-reduction goals of the program and exposes the American taxpayer.

FEMA's enforcement shortcomings may occur both through a failure to act on reported complaints by issuing probationary notices and a failure to follow through on those notices by putting communities on probation if they fail to correct their program violations. The 2006 FEMA-commissioned report estimated that, nationwide, 250 communities every year likely have serious compliance problems, and, thus, are candidates for probation.⁹⁴ Between 1986 and 2007, the most recent year for which public data are readily available, 114 communities were sent formal notice that they would be placed on probation if they failed to correct or remedy identified program deficiencies or violations.⁹⁵ Out of the 114 communities, only 63 were placed on probation.⁹⁶ Without better monitoring and tracking, it is impossible to determine whether the threat of probation proved sufficient for a community

to correct a violation prior to enforcement action being taken or FEMA failed to act. At a minimum, the data indicate the need for better tracking and reporting related to enforcement action.

Given that FEMA is legally required to publish notice of impending suspensions in the *Federal Register*,⁹⁷ we attempted to determine FEMA's recent suspension practices based on a review of *Federal Register* documents. Our team reviewed 516 *Federal Register* documents, published between January 1, 2009, and July 19, 2018, which revealed more than 11,700 notifications to communities warning them of potential suspension. The vast majority of these communities were notified in batches and these notices did not specify the cause of the suspension. However, an examination of these notices revealed the dates of the proposed suspensions matched or closely correlated with deadlines for the communities to adopt new or revised flood insurance rate maps. Failure to adopt these maps by the stated deadline is grounds to suspend a community from the NFIP.⁹⁸

During this 10-year period, we found only four notices specifying a compliance- or enforcement-related violation that were sent to individual communities. One additional community was notified individually of impending suspension without further descriptive information and for which the suspension date did not correspond to expiration of a flood map.⁹⁹ While optimally communities correct their violations prior to notice of imminent suspension, the data suggest that suspension is sufficiently rare that the threat of enforcement may not be credible.

C. Improving Compliance Through Greater Availability of Information and Resources

As climate change makes flooding more likely and extreme, noncompliance will undercut the nation's ability to adapt and prepare. As such, programmatic changes are necessary that help communities achieve compliance. First, better tracking and transparency of compliance issues can help identify the extent and nature of the most common program violations, allowing FEMA to determine how best to prioritize limited training and financial resources to help communities achieve compliance. Greater transparency could discourage violations through community pressure, especially if residents in noncompliant communities knew there was a likelihood that their flood insurance rates could be raised, or worse, that they could be ineligible for certain types of disaster aid if their community came to be suspended. However, this would require FEMA to use its enforcement sanctions more readily to make such a threat credible. The “public right-to-know” proposal, discussed in

89. See Collette, *supra* note 38.

90. *Id.*

91. MONDAY ET AL., *supra* note 77, at xii.

92. *Id.*

93. *Id.*

94. *Id.* at 106.

95. 2007 NFIP Compliance Actions—The Cycle of Probation, Remediation, and Reinstatement, *supra* note 81, at 7-8.

96. *Id.* at 7 (the remaining communities resolved their noncompliance issues before probation was imposed).

97. 44 C.F.R. §59.24.

98. FEMA, ADOPTION OF FLOOD INSURANCE RATE MAPS BY PARTICIPATING COMMUNITIES 4-6 (2012) (FEMA 495), <https://perma.cc/JQN8-GRFS>.

99. We contacted FEMA officials to confirm or clarify these findings regarding prevalence of suspension, but did not receive a response. Data underlying the analysis of *Federal Register* notices on file with the authors.

Section IV.A., could be a good structure for providing this greater transparency.

Second, more human and financial resources would benefit community compliance. According to FEMA, most program deficiencies and many violations are due to a lack of awareness and full understanding of the NFIP's floodplain management criteria, a lack of technical skills, and a failure to understand the rationale behind NFIP building and land use requirements.¹⁰⁰ At the local level, floodplain managers often wear "multiple hats," have a high turnover rate, and may lack appropriate training.¹⁰¹ A 2018 survey of local state floodplain managers corroborated these conclusions, finding that respondents ranked inadequate human resources and financial resources as the most significant challenges to enforcement, followed by knowledge of NFIP requirements, and insufficient technical support.¹⁰² Providing local and state managers with greater access to training and improved recordkeeping and data-sharing could help

head off noncompliance issues before they rise to a level requiring FEMA enforcement sanctions.

These two measures can help ensure a more robust response to climate change by supporting implementation of smarter floodplain development. While a credible threat of enforcement is part of a cooperative enforcement model, the ultimate goal of the program is not to suspend communities from the program, but to help them reduce the flood risk of their citizens.

VI. Conclusion

Climate is already escalating the flood risks facing communities and exacerbating the rising debts of the NFIP. The four sets of reforms identified by this Comment provide a road map for potential innovations that Congress can consider when it completes long-term reauthorization of NFIP, currently scheduled for May 2019.

100. See FEMA, *supra* note 83, at 2.

101. See generally 2007 NFIP Compliance Actions—*The Cycle of Probation, Remediation, and Reinstatement*, *supra* note 81.

102. See BROKOPP BINDER SURVEY, *supra* note 79, at 4-5.