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Harvey, Irma, and the NFIP: Did the 2017 Hurricane Season Matter to Flood Insurance Reauthorization?

Robin Kundis Craig*

Abstract

The National Flood Insurance Program (NFIP) has become a coastal hurricane insurance program—a fact that is bankrupting it. As a result of climate change, the ocean surrounding the United States is both rising and becoming warmer, and hurricanes and other coastal storms are projected to become both more frequent and more destructive. While no particular hurricane can yet be blamed exclusively on climate change, these projections nevertheless have real implications for the future of the NFIP.

In 2017, Congress was gearing up to reauthorize the NFIP just as the United States entered its worst hurricane season in over a decade. This Article examines how hurricanes and other coastal storms have affected the NFIP, both in terms of its solvency and its potential goals. Specifically, after reviewing the NFIP’s history and its interactions with coastal hurricanes and storms, the Article explores the process of re-authorizing the NFIP in 2017 and 2018 while the United States was suffering through Hurricanes Harvey and Irma. It concludes that Congress is showing some signs of reforming the NFIP to take account of the increasing vulnerability of coastal properties but that the NFIP could do much more to promote climate change adaptability.

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INTRODUCTION: INSURANCE AND CLIMATE CHANGE ADAPTATION

In April 2014, Farmers Insurance Company filed nine high-profile class-action lawsuits on behalf of itself, other insurance companies, and policyholders with damaged properties against approximately 200 Chicago-area municipalities, arguing that these municipalities were failing to deal with climate change.¹ Specifically, Farmers Insurance alleged that these cities and counties were aware that climate change was leading to heavier rains but were failing to upgrade their water infrastructure—especially sewers and stormwater drains—in response.² The lawsuit came almost exactly one year after Illinois Governor Pat Quinn (D) declared a state of emergency in the face of unprecedented rains that flooded Chicago, overwhelming sewers, creating “geysers of wastewater,” and turning city streets to rivers navigable by kayak and canoe.³ The losses from the spring 2013 flooding totaled at least $218 million—and much of that loss was covered by insurance.⁴

While Farmers Insurance dropped its lawsuits in early June 2014,⁵ those lawsuits still served to highlight the potential role of insurance in climate change adaptation. For example, ThinkProgress noted in May 2014 that:

Insurance companies are becoming increasingly concerned, and more vocal, about the rising costs of climate change. With large fossil fuel companies reluctant to take greenhouse gas mitigation efforts in the face of potential profit losses, the behemoth insurance industry could provide a

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² Id. The municipalities acquired this knowledge, the lawsuit further claimed, through a 2008 climate change action plan and a 2011 report from the regional water management authority detailing the deficiencies. Gail Sullivan, “Climate change: Get ready or get sued,” The Washington Post, https://www.washingtonpost.com/news/morning-mix/wp/2014/05/19/climate-change-get-ready-or-get-sued/?utm_term=.609be5771e1f (May 19, 2014).
counterbalance to the energy industry when it comes to incentivizing near-term emissions cuts, or at least adaptation to the effects of climate change.\textsuperscript{6}

The Christian Science Monitor reported similarly that “insurance companies are vocal about the rising costs of global warming and want to push cities to invest in prevention as a way to avoid future lawsuits.”\textsuperscript{7} Somewhat perversely, however, one of the immediate responses to Farmers Insurance’s lawsuits was to strengthen governments’ immunity from such tort liability.\textsuperscript{8}

The fact that the law can create incentives is well-documented in the literature\textsuperscript{9}; indeed, creating incentives to guide human behavior is often one of law’s primary goals and purposes.\textsuperscript{10} The fact that some of these legal incentives are or become perverse is also well-documented in the literature,\textsuperscript{11} especially in environmental and natural resource regulation.\textsuperscript{12}

Insurance, in turn, operates primarily to mitigate risk.\textsuperscript{13} By changing the costs or potential costs to private actors of certain behaviors, insurance makes those behaviors less risky to specific individuals by effectively spreading the costs over a larger population of at-risk individuals, not all of whom will actually suffer harm.\textsuperscript{14} As a result, insurance can

\begin{thebibliography}{10}
\bibitem{He2016} Qihao He, Mitigation of Climate Change Risks and Regulation by Insurance: A Feasible Proposal for CHINA, 43 BOSTON COLL. ENVT'L. AFFAIRS L. REV. 319, 325 (2016); Edward P. Richards, Applying Life Insurance Principles to Coastal Property Insurance to Incentivize Adaptation to Climate Change, 43 BOSTON COLL. ENVT'L. AFFAIRS L. REV. 427, 430 (2016).
\bibitem{He2016a} He, supra note 13, at 324-25; Richards, supra note 13, at 431.
\end{thebibliography}
directly incentivize actions—like living on the coast—that would otherwise be too risky for anyone except the extremely wealthy to undertake.¹⁵

Both the law and the availability of insurance have been instrumental in promoting coastal development. This Article focuses on the National Flood Insurance Program (NFIP) and its relationship to coastal hurricanes, arguing that the NFIP provides a quintessential example of perverse legal incentives for the coast in a climate change era. By allowing homeowners both to pay below-market insurance rates and to recover multiple times for flooded properties, the NFIP incentivizes development of the floodplains and coast—two geographic areas where climate change adaptation strategies would benefit from legal incentives for infrastructure withdrawals. Instead, the NFIP is increasingly becoming a National Hurricane Insurance Program, with major hurricanes along the Gulf and East Coasts of the United States driving most of the program’s major payouts. Hurricane-related payouts are a significant reason why the NFIP is close to bankruptcy, and the prominence of hurricanes in the NFIP is also creating regional tensions, with western states largely subsidizing states on the Gulf and East Coasts.

The NFIP came up for reauthorization in 2017—just as the United States was experiencing its worst hurricane season in over a decade. As a result, this most recent reauthorization process offers a window into how—or whether—Congress is thinking about the relationships among climate change, insurance incentives, and federal fiscal liabilities. This Article begins with an overview of the NFIP and its growing relationship with coastal hurricanes. Part II will then review the 2017 hurricane season, including the implications of Hurricanes Harvey and Irma for the NFIP. Part III then examines the NFIP reauthorization process in more detail, focusing on H.R.2874, “The 21st Century Flood Reform Act,” which the House of Representatives passed in November 2017 and which is still awaiting a Senate response. The Article concludes that, while Congress appears to be taking some important steps toward recognizing the vulnerability of coasts, it could still do much more to transform the NFIP into a program that actively promotes climate change adaptation.

I. THE NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

Specifically because private insurance would not cover flood-prone areas, Congress enacted the National Flood Insurance Program in 1968. Today, coastal property owners are both the primary beneficiaries and the primary bankrupters of the program, particularly because of increasing numbers of increasingly expensive losses caused by hurricanes. Given that climate change is expected to increase both the frequency and the

¹⁵ Richards, supra note 13, at 428.
severity of these costly coastal storms, it is worth re-examining the NFIP’s role in the Anthropocene.

A. Overview of the National Flood Insurance Program (NFIP)

The National Flood Insurance Program attempts to “correct” decades of increasing flood damage for which the federal government was limited to providing post-disaster relief. After Hurricane Betsy devastated the Gulf of Mexico coast in 1965, Congress enacted the Southeast Hurricane Disaster Relief Act, which authorized an insurance feasibility study. The resulting 1966 study recommended a federal flood insurance program, and in 1968 Congress created the National Flood Insurance Program (NFIP) through the National Flood Insurance Act (NFIA). The primary purposes of the NFIP are to “[b]etter indemnify individuals for flood losses through insurance; [r]educe future flood damages through State and community floodplain management regulations; and [r]educe Federal expenditures for disaster assistance and flood control.”

Unlike most private insurance, the NFIP directs its incentive structures toward municipalities, not private behavior. Specifically, the NFIP uses insurance coverage as an incentive to local governments to encourage them to regulate to reduce flood damage, enabling “property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages.” As such, unlike much traditional property insurance, the NFIP generally focuses less on how individual property owners behave than on how municipalities regulate: “If a community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in floodplains, the Federal Government will make flood insurance available within the community as a financial protection against flood losses.”

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22 *Id.* at 1.
The NFIP does, however, seek to make both governments and individuals more cognizant of flooding risks. For example, the NFIP requires the Federal Emergency Management Agency (FEMA) to identify and map floodplains, which “creates broad-based awareness of the flood hazards and provides the data needed for floodplain management programs and to actuarially rate new construction for flood insurance.” Since the 1973 amendments, moreover, the NFIP also requires property owners to “purchase flood insurance if they live in a ‘Special Flood Hazard Area’ (SFHA) and have a mortgage from a federally backed or regulated lender.” As FEMA explains,

the 1973 Act required that Federal agencies and federally insured or regulated lenders had to require flood insurance on all grants and loans for acquisition or construction of buildings in designated Special Flood Hazard Areas (SFHAs) in communities that participate in the NFIP. This requirement is referred to as the Mandatory Flood Insurance Purchase Requirement. The SFHA is that land within the floodplain of a community subject to a 1 percent or greater chance of flooding in any given year, commonly referred to as the 100-year flood.

In 2009, the federal government issued 5,700,235 flood insurance policies to individual homeowners within communities participating in the NFIP, which was the highest number of policies issued in a given year. While the number of issued policies has slightly declined since 2009, the federal government still issues over five million flood insurance policies every year.

B. The NFIP on the Coasts

Originally, the goal of the NFIP was to “mov[e] people out of harm’s way,” but it has “morphed into a program that moved them right into harm’s way, indeed paying

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them with cheap insurance to move [to flood prone areas.]”  

As scholars have emphasized, “[b]y providing subsidized flood insurance to coastal properties, the NFIP encourages Americans to purchase property on the coast.”Moreover, while the NFIP still encourages better building codes and land use regulation along the coast, those measures are often inadequate. For example, raised houses in New Orleans were still “smashed by walls of water fifteen- to twenty-feet high” during Hurricane Katrina.

Property owners in coastal states are the primary beneficiaries of the NFIP. Of the states where more than 60,000 NFIP policies were in force in 2016, for example, all but Pennsylvania (64,588 policies) are coastal states—in descending order by number of policies, these states include Florida (1,813,592), Texas (589,357), Louisiana (452,680), California (304,388), New Jersey (233,789), South Carolina (201,373), New York (188,530), North Carolina (130,258), Virginia (106,005), Georgia (89,295), Maryland (68,386), Mississippi (66,169), Massachusetts (64,689), and Hawaii (60,199).

Coastal properties also dominate repetitive loss payments from the NFIP—that is, repeat payments resulting from more than one flooding disaster. Repetitive-loss properties are the primary evidence of the NFIP’s perverse incentive structure because they represent the program’s facilitation of rebuilding in risky areas, rather than encouraging property owners to migrate inland.

Repetitive-loss properties are also an important cause of the NFIP’s insolvency. According to the Union of Concerned Scientists, “NFIP has paid out almost $9 billion in claims to repetitive-loss properties, which amounts to about a quarter of all payments since 1978. Repetitive-loss properties . . . account for just 1.3 percent of all policies but are responsible for fully 25 percent of all NFIP claim payments since 1978.” Some of

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31 Houck, supra note 29, at 1078–79.
32 2016 GAO FLOOD INSURANCE REPORT, supra note 23, at 7 fig. 1.
33 2013 UCS FLOOD INSURANCE REPORT, supra note 28, at 9 & fig. 6.
34 “[S]horeline and climate experts, public officials and others have grown increasingly critical of [programs like the NFIP that insure repetitive losses along the coast], arguing that they encourage rebuilding in places that have already shown themselves to be flood-prone and are likely to become more so because of climate change and its associated sea level rise.” Jan Ellen Spiegel, “CT’s repeat flood damage dilemma: move out or rebuild?”, The CT Mirror, https://ctmirror.org/2015/10/09/cts-repeat-flood-damage-dilemma-move-out-or-rebuild/ (Oct. 9, 2015).
35 2013 UCS FLOOD INSURANCE REPORT, supra note 28, at 9 fig. 6. According to Scientific American, “Properties that flood repeatedly represent about 1 percent of the total policies of the program but add up to 25 to 30 percent of the claims. The also represent about $12 billion of the program’s $23 billion debt.” Erika Boldstad, “Insurance May Be Dropped for Properties That Repeatedly Flood,” Scientific American,
the individual stories defy common sense: Some properties have made over 40 claims each; “[o]ne property in Houston received 16 payouts totaling $806,591, more than seven times the structure’s value;” and “[o]ne house in Alabama, valued at $153,000, has received $2.25 million in NFIP payouts . . .”36 As of April 2016, FEMA had identified approximately 11,900 remaining NFIP-Insured properties that qualify as severe repetitive-loss properties,37 up from approximately 9000 such properties identified in 2011.38 While amendments to the NFIP in 2004 allowed the federal government to buy out repetitive-loss property owners,39 repetitive-loss coastal properties have become political and financial issues in Connecticut,40 Florida,41 Louisiana,42 and Texas.43

Coastal properties “are currently insured by a combination of National Flood Insurance Program (“NFIP”) policies, some private excess coverage for flooding, and federal disaster relief that is provided after specific events. This bundle of resources is highly subsidized and encourages rebuilding in areas that are already at high risk and which will eventually be inundated.”44 The NFIP “provides residential coverage up to

43 Id.
44 Richards, supra note 13, at 428.
$250,000 for the structure and $100,000 for contents, and up to $500,000 for business structures and $500,000 for business contents.”

C. The NFIP, Hurricanes, and Incentives

In a very real sense, the NFIP defies both the realities of coastal dynamics and the logic of insurance schemes. Part of the issue is subsidized premiums for properties located in areas likely to flood, which make the program financially untenable in the long run—but homeowners remain unwilling to pay the real cost of building along a coast. Indeed, the NFIP exists in large part because “[p]rimary insurers—those that sell standard insurance policies to individuals and businesses—. . . could not charge affordable premiums and profit when private flood insurance was proposed in the 1950s.” As noted, however, the federal government has also not been able to make the program pay for itself:

The NFIP is designed to pay losses and operating expenses out of policyholder premiums. However, the premiums that NFIP policyholders have paid have historically been insufficient to cover the program's losses from flood claims. This is primarily because to achieve the NFIP's objectives, many NFIP policyholders have long received heavily subsidized premium rates. Premium discounts have long been ‘given to any structure that was built before FEMA had mapped the flood risk in an area (referred to as pre-FIRM structures),’ in addition to several other categories of homeowners. Even in [special flood hazard areas]—the areas most prone to damage from flooding—pre-FIRM structures have historically enjoyed grandfathered rates. Policymakers justified these discounts on the theory that lower rates would convince more communities to join the NFIP, that high premiums would deter insurance purchases, and that high rates could force the abandonment of economically viable buildings. In 2013, roughly twenty percent of flood insurance policies nationwide received discounts, typically worth fifty-five to sixty percent off the full-risk price. FEMA's 2011 Actuarial Rate Review noted that, because of discounted premium rates, “it is currently impractical for the NFIP to be actuarially sound in the aggregate.”

The GAO, similarly, has noted that “[a]s a result of the program’s importance, level of indebtedness to Treasury, and substantial financial exposure for the federal government

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45 Id. at 446-47.
47 Fox, supra note 18, at 217.
and taxpayers, as well as FEMA’s operating and management challenges, NFIP has been on our high-risk list since 2006.”

More basically, the NFIP incentivizes building in the wrong places, including along the coast. Indeed, one researcher noted that:

The NFIP is an actuarial joke. It would be like having a federal automobile insurance company that only insured teenage boys who drink and drive. By definition the properties covered by the program are doomed to be flooded, damaged, and even destroyed, not just once, but time and time again.\textsuperscript{49}

FEMA itself has recognized that the NFIP exists because private insurance schemes for the properties it insures cannot function profitably. Thus:

As early as the 1950’s, when the feasibility of providing flood insurance was first proposed, it became clear that private insurance companies could not profitably provide such coverage at an affordable price, primarily because of the catastrophic nature of flooding and the inability to develop an actuarial rate structure which could adequately reflect the risk to which flood-prone properties are exposed.\textsuperscript{50}

Thus, the NFIP has always stepped in where private insurance companies feared to tread, creating incentives to build in risky areas like coasts that the private market would not support.\textsuperscript{51}

Recent studies more concretely pinpoint the roles of coastal properties and hurricanes in the NFIP’s insolvency. Increasing numbers of increasingly damaging and expensive coastal storms in the 21st century have underscored the financial incoherence of the NFIP in a climate change era. “Almost 50 years [after its creation], the NFIP is $25 billion in debt, partly because of these subsidized rates that do not reflect the true cost of owning coastal property.”\textsuperscript{52}

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\textsuperscript{48} 2016 GAO FLOOD INSURANCE REPORT, supra note 23, at 1.
\textsuperscript{50} 2002 FEMA NFIP OVERVIEW, supra note 16, at 1.
\textsuperscript{51} See 2013 UCS FLOOD INSURANCE REPORT, supra note 28, at 1 (“In the face of increasingly unmanageable risks, many private insurers have left the coastal insurance market. The National Flood Insurance Program (NFIP) is now practically the sole provider of flood insurance for home owners and small businesses nationwide.”).
\textsuperscript{52} Shweitzer, supra note 30, at 250.
NFIP far into insolvency, reflecting both an increasing frequency of these storms and the increasing physical and financial damage that they can inflict. As for frequency,

Starting in the 1990s, major storms began rolling into the Gulf of Mexico like bowling balls. Eight of the most damaging hurricanes in history came ashore in the next decade: Opal, Danny, Georges, Frances, Lili, Ivan, Katrina, and Rita. Losses soared. In 2001, NFIP payouts topped a billion dollars. In 2005, they topped over thirteen billion, and they broke the bank. Losses were over thirty billion cumulatively through 2006.53

However, the increasing amount of and wealth invested in coastal infrastructure has also helped to make more recent storms more costly:

Prior to Tropical Storm Allison in 2001, the National Flood Insurance Program (NFIP) had never experienced a storm resulting in over $1 billion in damage. Since then, however, Hurricane Katrina imposed a death toll estimated to range from just under 1,000 to nearly 2,000 and caused an estimated $148 billion in total damages and costs; Hurricane Irene in 2010 caused 45 deaths and $10.1 billion in total damages and costs; and Superstorm Sandy in 2012 resulted in 159 deaths and $65.7 billion in total damages and costs.54

NFIP collects about $3.3 billion in premiums each year,55 but that has not been enough in this century to cover its losses—primarily because of coastal hurricanes. As the Government Accountability Office noted in a report to Congress in August 2016,

Since 2000, NFIP has experienced several years with catastrophic losses, primarily from Hurricane Katrina and the other 2005 storms and Superstorm Sandy in 2012. Since then, FEMA has needed to borrow money from the U.S. Department of the Treasury (Treasury) to cover claims in some years. As of March 2016, FEMA owed Treasury $23 billion.56

53 Houck, supra note 29, at 1078.
54 Fox, supra note 18, at 206–07.
The “NFIP paid out more claims in 2005 [following Hurricane Katrina] than it had paid out over the entire life of the program to that point.” Hurricane Katrina, for example, made Louisiana the second-largest recipient of NFIP payments; without that event, Louisiana would rank number 12. Because “FEMA had insufficient funds to cover the claims, and Congress had to increase NFIP’s borrowing authority to $20.775 billion. Following Superstorm Sandy, that borrowing limit was increased again to $30 billion.” Superstorm Sandy had similarly distorting impacts on NFIP payments and was singlehandedly responsible for making New Jersey and New York top-10 NFIP payment recipients. These two storms thus demonstrate the sensitivity of the NFIP to hurricanes and other major coastal storm events.

In anticipation of the 2017 reauthorization of the NFIP, the Congressional Budget Office (CBO) prepared a report on the program’s fiscal soundness that underscores the distorting role that coastal properties and hurricane exposure are playing. The CBO concluded overall that the NFIP “had an expected one-year shortfall of $1.4 billion,” which “is attributable largely to premiums’ falling short of expected costs in coastal counties, which constitute roughly 10 percent of all counties with NFIP policies but account for three-quarters of all NFIP policies nationwide.” Specifically, coastal counties had a net shortfall of $1.5 billion, while inland counties had a net surplus of $200 million. The coastal counties’ shortfall, moreover, arises because premiums “do not cover the expected cost of wave damage from storm surges.”

The CBO’s report became even more targeted, however. It estimated “that the 33 counties with a shortfall of more than $10 million accounted for nearly 90 percent of the

57 Fox, supra note 18, at 218.
59 Fox, supra note 18, at 218.
62 Id. at 1.
63 Id. at 2. See also id. at 13 (“Counties that CBP defined as coastal for this analysis—those with at least some expected claims from storm surges or for which precipitation from coastal storms (hurricanes, tropical storms, and nor-easters) accounted for more than 75 percent of expected claims—represented only 10 percent of all counties with NFIP policies. However, they accounted for most of the program’s total shortfall.”).
64 Id. See also id. at 12 (“On net, coastal counties sow a large shortfall and inland counties show a relatively small surplus.”).
65 Id.
$2 billion from all 823 counties with shortfalls”—and most of those 33 counties were located “along the southeast coast and the Gulf of Mexico.” 66 In contrast, most of the counties with the highest surpluses were located “along the northeast and west coasts,” 67 creating a map of donor and recipient counties that shows how much of the rest of the nation subsidizes homeowners along the Gulf of Mexico and southeast Atlantic coasts. 68

Coastal storm-related damages account for roughly two-thirds of NFIP payouts over the last 35 years. 69 Flooding from hurricane-related storm surges account for 37 percent of the payouts; from hurricane-related precipitation, 16 percent; from tropical storms, five percent; and from other kinds of coastal storms like nor’easters, two percent. 70 In contrast, inland flooding causes only 36 percent of NFIP payouts. 71 Thus, the NFIP truly is becoming a coastal hurricane insurance program.

The NFIP also promotes a counter-adaptive psychological world view of coastal living. For example, property owners insured under NFIP appear to accept coastal damage and destruction as a normal event, not as a signal to consider relocation. Thus, in southern California in January 2016, “[m]assive waves cleared a 25-foot retaining wall and crashed into a Pacifica restaurant … bursting through the beachside windows and rushing over tables and chairs.” 72 Although the restaurant has suffered the same damage in the past, the owner was counting on insurance to repair the damage yet again, in time for an upcoming event. 73 Likewise, coastal flooding near Nantucket in February 2017 was described as a normal way of life. 74

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66 Id. at 12.
67 Id. at 13.
68 Id. at 14 fig. 2. See also id. at 15 (“the additional expected costs from wave damage are spread broadly among the NFIP policyholders, resulting in a cross-subsidy from inland counties (on average) to coastal counties. That is, some of the expected costs associated with coastal policies are covered by high premiums paid by policyholders in inland counties.”); id. at 16 (“Eighty-five percent of the policyholders for properties located in Zone V, the highest risk [and coastal] zone, do not pay rates that reflect their actual flood risk.”).
69 Id. at 4.
70 Id.
71 Id.
73 Id.
II. The 2017 Hurricane Season, Climate Change, and Their Implications for the NFIP

A. Hurricane Harvey: A Climate Change Connection to Record Rain

Hurricane Harvey was a Category 4 hurricane that made landfall on the central Texas coast just north of Corpus Christi on August 25, 2017. At its first landfall, it was 280 miles in diameter and had 130 mile-per-hour winds. It moved north to Houston the next day and remained there for four days, then made landfall a third time on August 29 at Port Arthur and Beaumont, Texas, near the Louisiana border. While Hurricane Harvey concentrated its force on Texas and Louisiana, “[i]t affected 13 million people from Texas through Louisiana, Mississippi, Tennessee, and Kentucky,” and at least 88 people died as a result of the storm.

Storm surge from Hurricane Harvey ranged from three feet to 12.5 feet, with the highest storm surge occurring in Aransas County in a National Wildlife Refuge, limiting the amount of human damage. However, most of Hurricane Harvey’s damage came from flooding caused by unprecedented rainfall. As noted, the hurricane stalled out over Houston, dropping two feet of rain in the first 24 hours and 40 inches over 48 hours. Two reservoirs overflowed. When the hurricane made landfall for the third time, “[i]t dumped 26 inches of rain in 24 hours” at the Louisiana border, then rained an additional 10 inches on Nashville, Tennessee, on September 1.

78 Id.
81 Id. “In comparison Hurricane Katrina dropped just 5 to 10 inches of rain in 48 hours. Most of its flooding came from storm surges that overwhelmed the levee system.” Id.
82 Id.
In an attempt to describe the scale of the rainfall, a *Washington Post* reporter noted that “[a]t least 20 inches of rain fell over an area (nearly 29,000 square miles) larger than 10 states, including West Virginia and Maryland (by a factor of more than two)” and “[a]t least 30 inches of rain fell over an area (more than 11,000 square miles) equivalent to Maryland’s size.” At the storm’s peak on September 1, one-third of Houston was underwater, and “[t]otal rainfall hit 51.88 inches in Cedar Bayou on the outskirts of Houston. That’s a record for a single storm in the continental United States.”

In addition, “Harvey flooded 800 wastewater treatment facilities and 13 Superfund sites. That spread sewage and toxic chemicals into the flooded areas.” On August 31, an Arkema chemical plant in Crosby, Texas, ignited after the hurricane disrupted the cooling system necessary to keep the chemicals stable.

“As of September 5, 2017, Hurricane Harvey damaged 203,000 homes, of which 12,700 were destroyed.” At $125 billion in damages, the storm ranks second only to Hurricane Katrina (adjusted to 2017 dollars) as the most damaging storm in U.S. history according to NOAA’s National Hurricane Center.

Hurricane Harvey caused a “thousand-year flood,” reaching many victims that were outside the NFIP’s Special Flood Hazard Areas—a significant reason that only about one-fifth of Hurricane Harvey’s Texas victims had flood insurance despite the

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89 Id.

90 Id.


93 Ari Blask & Ike Brannon, “Hurricane Harvey Proved We Need More Flood Insurance Competition,” *Time*, http://time.com/4927852/hurricane-harvey-flood-insurance/ (Sept. 5, 2017). In Louisiana and Texas combined, approximately 70 percent of the homes damaged by Harvey were not covered by flood
fact that there are more than 584,000 active NFIP policies in Texas, the second most heavily NFIP-insured state in the nation after Florida.\textsuperscript{94} Even so, as of early November 2017, FEMA had paid out over $4 billion to NFIP policyholders damaged by Hurricane Harvey.\textsuperscript{95}

Harvey may be the first hurricane for which scientists agree that climate change played a surprisingly large role in the storm’s severity.\textsuperscript{96} In December 2017, two research groups found that Harvey’s record rainfall “was as much as 38 percent higher than would be expected in a world that was not warming.”\textsuperscript{97} Warmer-than-normal air temperatures, sea levels that are six inches higher than 20 years ago, and climate change-affected weather patterns that promote storm stalling may all have contributed to Harvey’s excessive precipitation.\textsuperscript{98} In addition, both studies “found that climate change roughly tripled the odds of a Harvey-type storm.”\textsuperscript{99} Thus, as climate scientists have predicted, it


appears that climate change is already increasing the likelihood of increasingly severe hurricanes.

B. Hurricane Irma: A Historic Storm

“Irma was the strongest storm on record in the Atlantic—excluding the Caribbean and Gulf of Mexico—with maximum winds of 185 mph and an unofficial wind gust of 199 mph.”

It remained a hurricane from August 31 until September 11, 2017. The storm stretched 650 miles from east to west and affected nine states in the United States, as well as devastating the Caribbean. At its peak, Irma’s cloud field covered 300,000 square miles. It also “the first storm on record to maintain winds as strong as 185 mph for 37 hours.”

In the Caribbean, Hurricane Irma was sheer power. According to one reporter, “Its coastal storm surges were 20 feet above normal tide levels,” and the hurricane “held 7 trillion watts of energy. That's twice as much as all bombs used in World War II. Its force was so powerful that earthquake seismometers recorded it. It generated the most accumulated cyclone energy in a 24-hour period.”

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102 Id.
103 Id.
Irma made landfall eight times. It made landfall on Barbuda on September 6 (Category 5, 185 miles per hour); St. Marten (Category 5, 185 miles per hour); British Virgin Islands (two landfalls, Category 5, 185 miles per hour); Little Inagua, Bahamas (Category 5, 160 miles per hour); northern Cuba on September 9, flooding Havana (Category 3-4, 125-160 miles per hour); Florida Keys on September 10 (Category 4, 130 miles per hour); and finally in southwest Florida (Category 3, 115 miles per hour). Along the way, Hurricane Irma knocked out power in Puerto Rico (September 7) and dumped 15 inches of rain on Haiti and the Dominican Republic (September 7). In Barbuda, Hurricane Irma damaged 90 percent of the buildings, “destroyed almost all communication, and left 60 percent of the population homeless.” In its wake, Barbuda was entirely evacuated, and few people have returned. In the British Virgin Islands, “Hurricane Irma made two direct landfalls . . ., both at peak intensity; one on Tortola and another on Ginger Island. Damage in the BVI was extensive, and on some islands it was catastrophic. Many buildings and roads were left in ruins.” The hurricane then traveled to the U.S. Virgin Islands, decimating St. John, before traveling the entire length of

109 Id.
110 Id.
111 Id.
116 Id.
118 Id.
120 Id.
121 Id.
Florida from south to north.\textsuperscript{122} The Florida Keys suffered 12 inches of rain and a storm surge of 10 feet.\textsuperscript{123} “The most rain in the state fell on Fort Pierce. It received 15.9 inches. The strongest winds (142 mph) hit Naples.”\textsuperscript{124} At least 102 people died from the storm, 75 in Florida alone.\textsuperscript{125}

According to the National Hurricane Center, Hurricane Irma was the fifth costliest tropical storm in the United States, causing $50 billion in damages.\textsuperscript{126} In the United States, Hurricane Irma’s primary victims were in Florida. At the time Irma made landfall in Florida, the state contained 1.7 million NFIP policyholders, representing 35 percent of NFIP participants nationwide.\textsuperscript{127} Moreover, 15,000 Florida homes are NFIP repetitive-loss properties.\textsuperscript{128} NFIP policyholders damaged by Hurricane Irma had received $179 million in payouts as of early November 2017.\textsuperscript{129}

However, Hurricane Irma could have been far worse for cities like Miami. Even though “Miami-Dade, Monroe and Broward counties’ building codes have the nation's highest wind standards,”\textsuperscript{130} south Florida probably could not have withstood Irma at its strongest. As it was, when “Irma hit Miami with winds of 90 mph, three cranes collapsed and streets flooded,”\textsuperscript{131} As the news reported, “‘There’s no structure in Miami that’s built to withstand 185 mph winds,’ Keith Wolfe, president U.S. property and casualty for Swiss Re” said.\textsuperscript{132} In addition, “70 percent of the region’s buildings were built before 1994. Many of them have not been retrofitted. Even high-rises built to higher wind codes will suffer from heavy rains that seep in through roofs.”\textsuperscript{133}

C. Hurricane Maria: The Devastation of Puerto Rico

\textsuperscript{124} Id.
\textsuperscript{125} Id.
\textsuperscript{128} Id.
\textsuperscript{129} Id.
\textsuperscript{132} Id.
\textsuperscript{133} Id. (citation omitted).
\textsuperscript{134} Id. (citation omitted).
After forming as a tropical storm on September 16, 2017, Maria rapidly intensified into a Category 5 hurricane. It first made landfall on September 18 on Dominica, devastating the island.\textsuperscript{134} Maria also battered the U.S. Virgin Islands for a second time, and about 80 percent of those islands remained without power for more than a month.\textsuperscript{135}

What Hurricane Maria is most infamous for, however, is its destruction of Puerto Rico, a U.S. territory. On September 20, Hurricane Maria made landfall on Puerto Rico as a Category 4 hurricane,\textsuperscript{136} “the strongest storm to hit Puerto Rico in 85 years.”\textsuperscript{137} “The hurricane knocked out power to more than 90 percent of the island, and largely disrupted cell and water service.”\textsuperscript{138} “The energy grid [wa]s heavily damaged, with an island-wide power outage”\textsuperscript{139}; Maria also destroyed Puerto Rico’s radar.\textsuperscript{140} On September 22, “The National Weather Service order[ed] the evacuation of about 70,000 people living near the Guajataca River in northwest Puerto Rico because a dam [wa]s in danger of failing.”\textsuperscript{141} Officially, 64 people died because of the storm, but some news agencies put the number closer to 1000.\textsuperscript{142}

The U.S. government received serious criticism for not responding adequately to Puerto Rico’s devastation.\textsuperscript{143} Hurricane Maria “destroyed thousands of homes, killed at

\begin{footnotes}
\item[140] Id.
\item[141] Id.
\end{footnotes}
At least 64 people and left thousands without electricity or water for months.”144 A month after the hurricane, about 35 percent of Puerto Rico’s 3.4 million residents still lacked access to clean water, and FEMA’s emergency provisions appeared to many to fall far short of basic human needs.145 As of late January 2018, “about 60,000 homes are still without roofs, 2.3 million people live in areas at risk of water contamination, and 15.5% of the population still lacks electricity.”146 By mid-February 2018, “99% of customers in Puerto Rico had running water, and 84% of the island had power back,” but “[m]ore than 400,000 customers still don’t have electricity.”147 Nevertheless, despite a FEMA error that sparked fears that aid to the island was ending, that aid continues.148

“From a meteorological standpoint, Maria was nearly a worst-case scenario for the territory: The center of a huge, nearly Category 5 hurricane made a direct hit on Puerto Rico, lashing the island with wind and rain for longer than 30 hours.”149 The NFIP applies in Puerto Rico through MAPFRE, which sells flood insurance policies for island properties pursuant to a contract with FEMA.150 Moreover, on November 1, FEMA made it easier for policyholders damaged by Maria to make claims, including a $20,000 advance.151 However, most homeowners on the island lacked even basic wind damage insurance,152 let alone a NFIP policy for flooding—there were only 5675 NFIP policies

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Nevertheless, even though Hurricane Maria is not contributing much to the NFIP’s debt, it now ranks as the third costliest hurricane in U.S. history. It caused $90 billion in damages, less than Hurricanes Katrina (2005) and Harvey but more than 2012’s Hurricane Sandy.\footnote{National Hurricane Center, National Oceanic & Atmospheric Administration, Costliest U.S. tropical cyclones tables updated 1, 2 tbl. 3a (Jan. 26, 2018), available at https://www.nhc.noaa.gov/news/UpdatedCostliest.pdf.}

D. The 2017 Hurricane Season, Climate Change, and the NFIP

Together, Hurricanes Harvey, Irma, and Maria made 2017 the costliest hurricane season in U.S. history, surpassing the previous record set in 2005, the year of Hurricanes Katrina, Rita, and Wilma.\footnote{Doyle Rice, “2017’s three monster hurricanes—Harvey, Irma, and Maria—among five costliest ever,” USA Today, https://www.usatoday.com/story/weather/2018/01/30/2017-s-three-monster-hurricanes-harvey-irma-and-maria-among-five-costliest-ever/1078930001/ (Jan. 30, 2018). See also Willie Drye, “2017 Hurricane Season Was the Most Expensive in U.S. History,” National Geographic, https://news.nationalgeographic.com/2017/11/2017-hurricane-season-most-expensive-us-history-spd/ (Nov. 30, 2017) (“Totals are still being calculated, but early tabulations indicate that the U.S. suffered more than $200 billion worth of damage from 17 named storms during the season, which began June 1 and ends Thursday, November 30. That easily eclipses the previous record of about $159 billion, set during the summer of 2005, when Hurricane Katrina inflicted massive devastation on New Orleans. A record 28 named storms formed that year.”).} However, the season had some other notable features, as well. First, according to The Weather Channel, in 2017, “[s]eventeen named storms, 10 hurricanes, and 6 major (Category 3 or stronger) hurricanes tore through the Atlantic Basin, well above the 30-year average of 12 storms, 6 hurricanes and 2 major hurricanes. This placed 2017 among the top 10 most active Atlantic seasons on record . . . .”\footnote{Jonathan Belles, “2017 Atlantic Hurricane Season Recap: 17 Moments We’ll Never Forget,” The Weather Channel, https://weather.com/storms/hurricane/news/2017-11-11-moments-hurricane-season-atlantic-irma-maria-harvey (Nov. 28, 2017). See also National Oceanic & Atmospheric Administration, Extremely active 2017 Atlantic hurricane season finally ends, http://www.noaa.gov/media-release/extremely-active-2017-atlantic-hurricane-season-finally-ends (Nov. 30, 2017) (“The season produced 17 named storms of which 10 became hurricanes including six major hurricanes (Category 3, 4 or 5)—including the first two major hurricanes to hit the continental U.S. in 12 years.”).} Besides Hurricanes Harvey, Irma, and Maria, the named storms included Arlene (tropical storm, central Atlantic), Bret (tropical storm, near Trinidad), Cindy (tropical storm, landfall in Texas/Louisiana), Don (tropical storm, east-southeast of Barbados), Emily
Second, Tropical Storm Arlene, the first of the season, formed on April 20, 2017, “more than a month before the beginning of hurricane season[and] the second earliest-forming tropical cyclone in the Atlantic in the satellite era (or since 1966).”¹⁵⁹ Third, Hurricane Maria, like Hurricane Irma, reached Category 5 strength, making 2017 only the second hurricane season in which two Category 5 storms made landfall.¹⁶⁰ Fourth, “[t]he 2017 Atlantic hurricane season was also the first season since records began in 1851 to have two Category 4 hurricanes make continental U.S. landfall in the same year (Harvey and Irma) . . . .”¹⁶¹ Fifth, “Irma, Jose and Katia marked the first time since 2010 that three hurricanes were active in the Atlantic Ocean at the same time.”¹⁶² Sixth, in October 2017, Ophelia became the tenth consecutively named storm to achieve hurricane status, the fourth recorded time—and first time since 1893—that ten consecutive hurricanes have occurred.¹⁶³ Notably, Ophelia also traveled to Wales, Scotland, and Ireland.¹⁶⁴ Finally, “September 2017, featuring Category 5 Hurricanes Irma and Maria and Category 4 Hurricane Jose, was the most active month of any Atlantic hurricane


¹⁵⁹ Id.


¹⁶¹ Id.; Kimberly Amadeo, “Hurricane Irma: Facts, Damage, and Costs,” The Balance, https://www.thebalance.com/hurricane-irma-facts-timeline-damage-costs-4150395 (Jan. 31, 2018) (“Irma’s attack was the first time in 100 years that two storms Category 4 or larger hit the U.S. mainland in the same year.”).


¹⁶⁴ Id.
season on record in terms of Accumulated Cyclone Energy (ACE)." The September 2017 storms included Irma, Jose, Katia, Lee and Maria, and "Lee and Katia were the only ones to not reach Category 4 or Category 5 intensity at their peaks."

As the studies linking climate change to Hurricane Harvey’s severe rainfall suggest, evidence indicates that climate change is making Atlantic hurricanes more likely, stronger, and more frequent. In 2008, James Elsner, James Kossin, and Thomas Jagger reported in Nature that Atlantic hurricanes had been getting stronger on average over the last 30 years. Notably, “Hurricane Patricia, in 2015, set the record at the time for top wind speed—215 miles per hour—in the north Atlantic. The next year Winston shattered records as the most intense cyclone in the Southern Hemisphere.” Climate models also predict more Category 4 and 5 storms, and warming ocean waters will continue to fuel hurricanes as they did in 2017, when “[u]nusually warm water in the area where hurricanes form in the Atlantic Ocean fueled the powerful storms, which formed when the peak of the season arrived in late August.” Overall, scientists conclude, events like Hurricane Harvey will become more likely.

Climate change thus poses a real problem for the NFIP when it comes to coastal properties, because current insurance is not structured to reflect the need for climate change adaptation. As Edward Richards has summarized:

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169 Id.


171 Kerry Emanuel, Assessing the present and future probability of Hurricane Harvey’s rainfall, 114:48 PNAS 12,681, 12,681-84 (Nov. 28, 2017).
The role of insurance in driving adaptation is limited because most insured risks are short-term weather risks that are not tightly linked to climate change during the time period of the typical insurance policy. The best fit is insurance for flooding of coastal communities that is exacerbated by baked-in sea level rise and climate change enhanced storms. Such properties are currently insured by a combination of National Flood Insurance Program (“NFIP”) policies, some private excess coverage for flooding, and federal disaster relief that is provided after specific events. This bundle of resources is highly subsidized and encourages rebuilding in areas that are already at high risk and which will eventually be inundated.172

The 2017 hurricane season certainly had an effect on the NFIP’s fiscal stability. In the wake of the 2017 hurricane season, the NFIP reached its approximately $30 billion borrowing limit, prompting Congress in October 2017 to forgive $16 billion of the program’s debt.173 However, continuing claims from the storms led the program to borrow another $6.1 billion in early November 2017, bringing its debt back up to more than $20.5 billion. 174 As of early December 2017, Harvey, Irma, and Maria had generated more than 120,000 NFIP policy claims, for which FEMA had paid $6.687 billion.175 FEMA expects payouts for the three hurricanes to total between $8.5 and $9.5 billion.176

More broadly, some call the 2017 hurricane season a harbinger of what climate change means for coastal storms.177 The NFIP, however, has not been updated for climate change and instead relies on historical flood data.178 As a result, without substantial

172 Richards, supra note 13, at 428.
176 Id.
reforms, its coverage of coastal properties is likely to increasingly diverge from reality. “In 2016, the non-partisan Congressional Budget Office estimated that damage from hurricanes costs roughly $28 billion per year. Over the next 60 years, those costs are expected to rise at least 40%, after adjusting for inflation.”179

The CBO, in preparing its advice to Congress in September 2017, was well aware that climate change could complicate coastal flooding and the NFIP’s solvency. As one source of uncertainty, for example, it noted that “scientists are seeking to better understand how climate change might affect sea temperatures and wind shear and how these changes, in turn, could affect the frequency and intensity of hurricanes.”180 In addition, it noted that “in the coming decades, coastal development and the effects of climate change are expected to increase property damage from coastal flooding. Climate change could increase damage by raising sea levels and potentially also by increasing the intensity of hurricanes.”181

III. The 2017-2018 NFIP Reauthorization Process: Is Congress Thinking About Hurricanes and Climate Change?

As the discussions above make clear, the impacts of climate change and coastal storms on coastal properties create real financial problems for the NFIP. The reauthorization process in 2017 and 2018 provides an opportunity to use the NFIP as a means both to educate the American public about the real risks of living along the Gulf of Mexico and southeastern coast and to reform the law to dis-incentivize continued coastal development. At the same time, the NFIP, by rewarding efforts to mitigate storm damage, could encourage active climate change adaptation. As the Union of Concerned Scientists has recommended, “Reforming our insurance system to reflect this growing exposure can help communicate the true risks to coastal communities so they are motivated to take protective steps.”182

The question, of course, is whether Congress will make the most of this opportunity. This part reviews the 2017-2018 NFIP reauthorization process for signs that hurricanes matter.

A. Hurricanes and the Last NFIP Reauthorization

180 2017 CBO NFIP REPORT, supra note 61, at 10 (citation omitted).
181 id. at 17.
Hurricanes have prompted congressional reforms of the NFIP in the past, although those reforms were short lived. In 2012, Congress enacted the Biggert Waters Flood Insurance Act\(^{183}\) “to eliminate the NFIP's debt by increasing flood insurance rates to reflect the true cost of owning coastal property.”\(^{184}\) This Act introduced the concepts of the 100-year and 500-year floodplain\(^{185}\) and provided for a national flood mapping program.\(^{186}\) It tried to eliminate subsidized flood insurance for certain properties, including repetitive-loss properties,\(^{187}\) and increased the rate at which premiums could be increased.\(^{188}\) In addition, the Act required that premiums reflect the real flood risk that properties face:

any property located in an area that is participating in the national flood insurance program shall have the risk premium rate charged for flood insurance on such property adjusted to accurately reflect the current risk of flood to such property, subject to any other provision of this Act. Any increase in the risk premium rate charged for flood insurance on any property that is covered by a flood insurance policy on the effective date of such an update that is a result of such updating shall be phased in over a 5-year period, at the rate of 20 percent for each year following such effective date.\(^{189}\)

The Act also intended to phase out grandfathering, “a practice that enables property owners to keep their old premium prices when a new FEMA flood map reclassifies them into a higher-risk flood zone.”\(^{190}\) Biggert-Waters “represented a bipartisan effort to improve actuarial soundness and program solvency.”\(^{191}\)

Less well-discusses is Biggert-Waters’ recognition that coastal flooding was an increasingly important threat. In addition to amending the National Flood Insurance Act, Biggert-Waters also amended the Integrated Coastal and Ocean Observation System Act of 2009\(^{192}\) to require the development of a Named Storm Event Model, accurate to 90 percent, that could identify named tropical storms and hurricanes that pose a threat to

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\(^{184}\) Schweitzer, supra note 30, at 250.


\(^{186}\) Id. § 100216.

\(^{187}\) Id. § 100205(a).

\(^{188}\) Id. § 100205(c).

\(^{189}\) Id. § 100207.

\(^{190}\) Id. at 251.

\(^{191}\) Tarlock & Chizewer, supra note 25, at 521.

coastal states and generate post-storm assessments. This model would then be used to help calculate loss allocations between wind and water for indeterminate losses along the coast—generally, properties completely destroyed by a storm.

Biggert-Waters represents one swing of the congressional pendulum regarding the NFIP, toward fiscal solvency. However, fiscal solvency measures can run counter to political will and the desires of coastal property owners to avoid facing the true costs of the risks they are incurring. Coastal property owners responded to Biggert Waters’ enactment with panic and opposition, and with some justification. Following Biggert Waters’ enactment, according to the GAO, “about 438,000 policies nationwide had higher premiums immediately,” and some of the increases were substantial. For example, many New Yorkers faced increases in their annual flood insurance premiums of between $10,000 and $15,000. In 2013, one woman in Massachusetts “was hit with a $68,000 insurance bill.”

As a result, Biggert-Waters’ reforms were short-lived. Opposition “culminated in the passage of the Homeowner Flood Insurance Affordability Act of 2014[199] . . . which repealed many key provisions of Biggert-Waters.” This Act “favors a more gradual increase to full-risk premiums and thus softens the ‘blow’ of Biggert-Waters on coastal homeowners.” “[P]olicyholders in high-risk areas who purchased flood insurance after Biggert-Waters went into effect, and had to pay a full-risk rate, are eligible for a refund under the Act.”

B. The CBO’s Recommended 12 Policy Approaches in 2017

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196 Shweitzer, supra note 30, at 250.
200 Fox, supra note 18, at 208–09.
201 Shweitzer, supra note 30, at 251.
202 Id. at 252.
In its September 2017 report on the NFIP, the CBO identified for Congress 12 policy approaches that the reauthorization legislation could take. The CBO grouped these suggestions into four categories—increase receipts; reduce subsidies; shift costs away from the NFIP; or adjust premiums to better reflect underlying risk factors—and evaluated against three potential congressional goals: improving the program’s solvency; better aligning premiums and risk; and keeping costs low for policyholders.203

These potential congressional goals are, of course, tradeoffs; in particular, as Biggert-Waters demonstrated, the goals of improving the NFIP’s solvency and of keeping costs low for all policyholders are in considerable tension. Thus, as might be expected, no single policy option that the CBO suggested can achieve all three posited goals for the NFIP reauthorization.204 For example, shortening the phase-out period for discounted premium rates would improve the program’s solvency and better align premium payments with actual risk, but this approach would increase the costs to policyholders.205 In contrast, adjusting premium rates to reflect the property’s actual value would better align premium payments with actual risk and would keep costs low for owners of lower-value properties, but this approach would not improve the program’s solvency, and rates could go up for owners of higher-value properties.206 Recognizing that Congress has vacillated regarding its policy priorities for the NFIP in the past,207 the CBO did not recommend any particular course of action for the NFIP reauthorization.

C. NFIP Reauthorization Efforts

After its 2012 reauthorization, the NFIP was set to expire on September 30, 2017.208 A series of congressional actions have extended the program’s effective date to March 23, 2018,209 but it has not yet been fully reauthorized.

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203 2017 CBO NFIP REPORT, supra note 61, at 23 tbl. 6.
204 Id.
205 Id.
206 Id.
207 Id.
On November 14, 2017, the House of Representatives passed H.R. 2874, The 21st Century Flood Insurance Reform Act, by a 237-189 vote. While “[t]he House Financial Services Committee drafted the legislation well before hurricanes Harvey, Irma, and Maria ravaged the southern coast of the United States and its territories,” “the monster storms added a new sense of urgency behind efforts to update the flood insurance program.”

H.R. 2874 would extend the NFIP for five years beyond its original September 2017 expiration. It contains measures both in improve the affordability of NFIP insurance and to more accurately reflect the risks to coastal properties. It also includes a variety of kinds of transparency measures intended to ensure that property owners understand both their insurance premiums and the flood risks they face.

Regarding affordability measures, H.R. 2874 first reduces the cap on annual increases in premiums from 18 percent to 15 percent. It also authorizes states to create flood insurance affordability programs for low-income policyholders. After FEMA approves these subsidies, the cost would be borne by other policyholders in the same state. In addition, the bill would require FEMA to finalize a monthly installment premium payment plan first required in the Homeowner Flood Insurance Affordability Act of 2014. Other measures in the bill encourage community-based and private flood insurance, as well as flood damage savings accounts.

Nevertheless, H.R. 2874 also contemplates that premiums for coastal properties should, in general, reflect the real risks that those properties face. It requires the FEMA Administrator to consider the differences between inland and coastal properties when calculating premium rates. The revised premiums for coastal properties would be

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214 Id. § 102.
215 Id. § 103.
216 Id.
217 Id. § 106.
218 Id. § 110.
219 Id. §§ 201-205.
220 Id. §§ 206-207.
221 Id. § 105(b), (c).
implemented two years after the bill is enacted.\textsuperscript{222} In addition, H.R. 2874 would allow premiums to be calculated not just based on the flood maps, but also in light of “other risk assessment data and tools, including risk assessment models and scores from appropriate sources . . . .”\textsuperscript{223} Communities participating in the NFIP would have to develop and implement community-specific plans to mitigate flood risks in areas repeatedly damaged by floods,\textsuperscript{224} and repetitive-loss properties would be subject to premium adjustments to reflect their flood risk, plus would have to mitigate those risks to keep flood insurance available.\textsuperscript{225} At the same time, however, for other properties, H.R. 2874 would amend previous mitigation measure provisions to allow a reduction in the risk premium rates for people who employ such measures.\textsuperscript{226}

Finally, to increase transparency, H.R. 2874 would first require that FEMA disclose its methodology for calculating risk-based premiums.\textsuperscript{227} It would also require the FEMA Administrator to clearly communicate for all new and renewed policies the policyholders’ “full flood risk determinations” and “the number and dollar value of claims for the property, over the life of the property . . . .”\textsuperscript{228} Current owners may also request any historical flood and flood insurance information from FEMA, and FEMA must respond within 30 days.\textsuperscript{229} Most dramatically, H.R. 2874 requires state and local governments to impose, “by statute or regulation, a duty on any seller or lessor of improved real estate located [in a flood zone] to provide any purchaser or lessee of such property a property flood hazard disclosure” that meets a list of federal disclosure requirements.\textsuperscript{230} If states and local governments fail to comply, no new NFIP policies will be provided.\textsuperscript{231}

Perhaps unsurprisingly, coastal interests object to the House’s approach. Notably, “Republicans representing coastal districts urged their colleagues to vote against the bill, warning it would make flood insurance less affordable for their constituents and threaten the solvency of the NFIP.”\textsuperscript{233} The bill is now with the Senate awaiting further action.

\textsuperscript{222} Id. § 105(c).
\textsuperscript{223} Id. § 301(a)(2).
\textsuperscript{224} Id. § 402(c).
\textsuperscript{225} Id. § 504(b), (g).
\textsuperscript{226} Id. § 113(b).
\textsuperscript{227} Id. § 104.
\textsuperscript{228} Id. § 107(a)(1).
\textsuperscript{229} Id. § 108(b).
\textsuperscript{230} Id. § 109(a).
\textsuperscript{231} Id. § 109(b).
\textsuperscript{232} Id. § 109(a).
**CONCLUSION**

With sufficient political will, the NFIP could become an insurance program that both highlights and educates Americans about the increasing risks that climate change poses to the nation’s coasts as a result of the combination of warming waters, rising tides, and generally shifting weather patterns, including increasing numbers of increasing severe (windy and rainy) storms. Several aspects of H.R. 2874 are a step in the right direction, including: (1) allowing different premium rates for coastal properties compared to inland properties; (2) broadening the tools allowed for calculating flooding risk, which could include subsidence and erosion information and sea-level rise projections for particular coastal locations; (3) ensuring that both current and future coastal owners understand the flooding and storm risks that their properties face; and (4) providing potentially more effective means for dealing with areas and properties subject to repeated flooding and loss.

Nevertheless, the NFIP reauthorization process has not yet fully embraced the realities either of the 2017 hurricane season or of climate change. First, the 2017 hurricane season taught us that many more properties are at risk from coastal storms than the flood maps acknowledge. However, some of those properties really are, still, only at risk during a “freak” or unusual (“1000-year”) storm, while others are at risk in virtually every tropical storm season. The NFIP could better differentiate these relative risks and, possibly, expand the eligible pool of properties to include properties that could benefit from flood insurance truly designed to protect against the rare catastrophe—that is, “coastal” properties for which, collectively over the long term, are likely to pay far more in NFIP premiums that they require in payments (as is generally the case with home casualty insurance).

Second, both the 2017 hurricane season and climate change in general teach us that “risk” is now a rapidly evolving concept. As a result, the NFIP reauthorization should require FEMA to update flood risks, particularly along the coast, on a much more regular basis—perhaps even continually. These risk updates, moreover, should have to take account of the latest and best projections from climate scientists and coastal erosion and subsidence experts to try to anticipate how flood risks along the coasts are changing, rather than just “hindcasting” based on past experience.

Finally, in light of climate change, the NFIP should become a program to encourage coastal retreat, particularly in areas already subject to repeated flooding and destruction. I have suggested elsewhere that Congress consider a “twice and out” policy that deems properties purchased by the federal government when NFIP payouts reach twice the fair market value of the property. Edward Richards, in contrast, has advocated

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for insuring coastal properties according to a life insurance model. Other approaches are possible, but for any property where premiums do not match government liability, such a presumption of a buyout strategy should be constitutionally sound and would help to facilitate the inevitable progression of the ocean inland.

235 Richards, supra note 13, at 428, 444-60.