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Flood Insurance and Climate Change: Rising Sea Levels Challenge the NFIP

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FLOOD INSURANCE AND CLIMATE CHANGE: RISING SEA LEVELS CHALLENGE THE NFIP

*Ernest B. Abbott**

I. INTRODUCTION

I really don't know why it is that all of us are so committed to the sea, except I think it's because in addition to the fact that the sea changes, and the light changes, and ships change, it's because we all came from the sea. And it is an interesting biological fact that all of us have, in our veins the exact same percentage of salt in our blood that exists in the ocean, and, therefore, we have salt in our blood, in our sweat, in our tears. We are tied to the ocean. And when we go back to the sea - whether it is to sail or to watch it - we are going back from whence we came. - John F. Kennedy¹

Each year more than 1.2 million² people move to coastal areas³ in the United States. As of 2010, approximately 123.3 million people,

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1. John F. Kennedy, *Remarks in Newport at the Australian Ambassador's Dinner for the America's Cup Crews*, in 1 PUBLIC PAPERS OF THE PRESIDENTS OF THE UNITED STATES: JOHN F. KENNEDY, 1961: CONTAINING THE PUBLIC MESSAGES, SPEECHES, AND STATEMENTS OF THE PRESIDENT, JANUARY 1 TO NOVEMBER 22, 1963 684 (1964).

2. Susan C. Moser et al., *Ch. 25: Coastal Zone Development and Ecosystems*, in CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT 579, 581 (Jerry M. Melillo et al. eds., U.S. Global Change Research Program 2014), available at <http://nca2014.globalchange.gov/report/regions/coasts>.

3. See NOAA, SPATIAL TRENDS IN COASTAL SOCIOECONOMICS (STICS): COASTAL COUNTY DEFINITIONS (2013), available at http://coast.noaa.gov/htdata/SocioEconomic/NOAA_CoastalCountyDefinitions.pdf

or roughly half of the U.S. population, lived in coastal shoreline counties.⁴ This is in addition to the more than 180 million tourists⁵ who visit U.S. coastal destinations each year. With population growth comes the infrastructure and development⁶ necessary to accommodate a life by the water and the potential risk of flood damage to that infrastructure and development.

This risk of damage from high water is increasing and not just due to the rise of property values in coastal areas. We have begun to see measurable increases in the sea level in coastal communities.⁷ Since the 1980s, the frequency and magnitude of “super storms”⁸ has increased, bringing greater damage to developed shorelines, inundation of low areas, coastal erosion, wetland loss and saltwater intrusion into estuaries and freshwater aquifers. Projections of sea-level increases vary. Sea levels are expected to rise by a minimum of 8 inches and up to 6.6 feet by 2100.⁹ Even if one were to rely upon minimal estimates, estimated damages would be no small matter. According to a recent report by the U.S. Global Change Research Program:

?redirect=301ocm. Coastal areas refers to counties that are directly adjacent to the open ocean, major estuaries, and the Great Lakes.

4. See NOAA, NATIONAL COASTAL POPULATION REPORT: POPULATION TRENDS FROM 1970 TO 2020 (2013), available at <http://stateofthecoast.noaa.gov/features/coastal-population-report.pdf>.

5. Moser, *supra* note 2.

6. Such as roads, residential properties, business development, sanitary wastewater and electrical utilities, among other things.

7. See *Sea Level 101, Sea Level Rise*, CLIMATECENTRAL.ORG, <http://www.climatecentral.org/what-we-do/our-programs/sea-level-rise/> (last visited Oct. 27, 2014). Global sea levels have risen about eight inches since 1880.

8. From 2000 to 2013 the average number of “billion dollar” weather events in the U.S. was ten events per year, an increase from six billion-dollar events per year the decade earlier. See *Billion-Dollar Disaster Event Types By Year (CPI-Adjusted), Billion-Dollar Weather/Climate Disasters: Time Series*, NOAA, <http://www.ncdc.noaa.gov/billions/time-series> (last visited Oct. 27, 2014).

9. Adam Parris et al., NOAA TECHNICAL REPORT, OAR CPO-1, GLOBAL SEA LEVEL RISE SCENARIOS FOR THE U.S. NAT’L CLIMATE ASSESSMENT 3 (2012). See also AECOM, THE IMPACT OF CLIMATE CHANGE AND POPULATION GROWTH ON THE NATIONAL FLOOD INSURANCE PROGRAM THROUGH 2100 (2013) [hereinafter FEMA CLIMATE REPORT]. This report was commissioned by FEMA, at the request of GAO, to study the effects of climate change and population growth on the National Flood Insurance Program. This report puts forward a more conservative maximum SLR of 4 feet. *Id.* at ES-4. In the context of risk-based analysis, some decision-makers use a wider range of scenarios resulting in a 6.6 ft SLR. *Id.* at C-8.

The projected costs associated with one foot of sea level rise by 2100 are roughly \$200 billion. These figures only cover costs of beach nourishment, hard protective measures, and losses of inundated land and property where protection is not warranted, but exclude losses of valuable ecosystem services, as well as indirect losses from business disruption, lost economic activity, impacts on economic growth, or other non-market losses.¹⁰

Economic considerations aside, low-lying shorelines, such as the Atlantic and Gulf Coast shorelines, are particularly susceptible even to minor sea-level rise: "[T]he slope of these areas is so gentle that a small rise in sea level produces a large inland shift of shoreline."¹¹

A large inland shift of shoreline due to sea-level rise has the potential not only to change existing boundaries of the areas mapped as coastal flood hazard zones but also to expand the size of the areas with significant flood risk. Approximately 58,000 square kilometers of coastline along the Atlantic seaboard and Gulf of Mexico are less than 1.5 meters above sea level, with approximately 1,600 square kilometers less than 1 meter above sea level.¹² "Sea level rise is not just a problem of the future, but is already affecting some coastal communities during high tide, such as Charleston, South Carolina, and Olympia in South Puget Sound."¹³

With the growth in population living along the water, and projected increases in water elevation levels over the next several decades, we must consider how well the National Flood Insurance Program ("NFIP")¹⁴ will succeed both in assuring that development near the water will be reasonably safe from flooding by encouraging more mitigation as well as adaptation measures, and in achieving some measure of fiscal stability so that taxpayer bailouts will no longer be needed to prop up the program.

10. Moser, *supra* note 2, at 595.

11. NAT'L ASSESSMENT SYNTHESIS TEAM, U.S. GLOBAL CHANGE RESEARCH PROGRAM CLIMATE CHANGE IMPACTS ON THE UNITED STATES: THE POTENTIAL CONSEQUENCES OF CLIMATE CHANGE VARIABILITY 108 (2001). This large inland shift may also be referred to as a shift of the SFHA.

12. Blake Hudson, *Coastal Land Loss and Mitigation - Adaptation Dilemma: Between Scylla and Charybdis*, 73 LA. L. REV. 31, 46 (2012).

13. Moser, *supra* note 2, at 581.

14. National Flood Ins. Act of 1968, 42 U.S.C. § 4001 *et seq.* (2012) [hereinafter NFIP].

In Part I of this paper, we document our view that losses from meteorological events, primarily flooding, have been increasing dramatically. Thus, however effective the NFIP has been in reducing flood risk below what it might have been in its absence, the NFIP has not been effective enough. In Part II, we set forth the basic techniques available to policy makers to reduce the vulnerability of existing and future infrastructure from loss due to flooding and other natural hazards. In Part III.A., we describe the many efforts Congress and the Federal Emergency Management Agency (“FEMA”), which administers the NFIP, have made in the *flood insurance* program to reduce the vulnerability of our built infrastructure and ecosystems to flood losses. While these efforts have been extensive, they have also been limited by economic and political realities: flood risk along the coasts and waterways can be very expensive, particularly for structures that were not located or designed to be out of harm’s way during flooding at the levels now being experienced, or at the flood levels now being predicted. In Part III.B., we discuss the many ways that Congress and FEMA have sought to use *disaster assistance* programs to encourage property owners to mitigate the risk of future disaster events, particularly flood disaster events, through physical mitigation and financial mitigation (insurance).

Despite these efforts, by 2012, the NFIP was burdened with a \$23 billion debt and a growing recognition that past efforts to curtail flood losses had not been enough.¹⁵ Part IV of this paper first discusses the brave, if perhaps naïve, attempt of Congress to fix the problem by quickly removing historic and systemic premium subsidies through the Biggert-Waters Flood Insurance Reform Act of 2012 (“BW-12”).¹⁶ But less than two years later, after the impact of BW-12 was felt in flood-prone areas across the country, Congress quickly retreated by enacting the Homeowner Flood Insurance

15. Association of State Floodplain Managers, *Flood Ins. Affordability, ASFPM Recommendations to Address the Impact of NFIP Reform 2012 (BW-12)*, FLOODS.ORG (Apr. 26, 2013), http://www.floods.org/ace-files/documentlibrary/2012_NFIP_Reform/ASFPM_recommendations_on_BW-12_affordability_26April2013.pdf.

16. Biggert-Waters Flood Ins. Reform Act of 2012, Pub. L. No. 112–141, 126 Stat. 916–88 (2012) [hereinafter BW-12].

Affordability Act of 2014 (“HFIAA”).¹⁷ Part V will conclude with observations on the challenges that the NFIP faces given the growth of flood risk recently forecast in FEMA’s climate change study.¹⁸ The controversy generated by BW-12’s effort to force property owners to bear the real cost of the flood risk they face is bound to return - again and again and again.

II. PROPERTY LOSSES FROM METEOROLOGICAL EVENTS IN THE UNITED STATES ARE INCREASING DRAMATICALLY

Over the last 60 years, property losses in the United States from meteorological events have increased significantly.¹⁹ This is not a political statement, thrown out to inflame the debate on whether our climate is changing;²⁰ it is a simple fact.²¹ The annual number of presidentially- declared “major disasters” has grown four-fold from the 10-20 experienced 60 years ago to an average of over 60

17. Homeowner Flood Ins. Affordability Act of 2014, Pub. L. No. 113-89, 128 Stat. 1020 (2014) [hereinafter HFIAA].

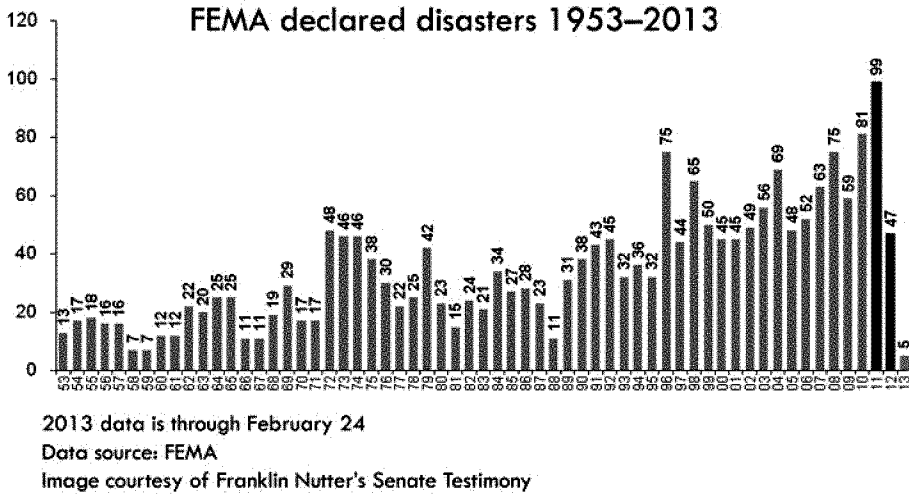
18. FEMA CLIMATE REPORT, *supra* note 9.

19. *See* FEMA, *Disaster Declarations by Year*, <http://www.fema.gov/disasters/grid/year> (last visited Oct. 27, 2014); *see generally* CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT (Jerry M. Melillo et al. eds., U.S. Global Change Research Program 2014), *available at* <http://nca2014.globalchange.gov/>.

20. Consider statements made by Dr. Pielke to the Committee on Environment and Public Works of the United States Senate that, “weather-related losses have not increased since 1990 as a portion of GDP,” and that “[f]loods have *not* increased in the U.S. in frequency or intensity since at least 1950” (emphasis added), and “[f]lood losses as a percentage of US GDP have dropped by about 75 percent.” *Hearing on Climate Change: It’s Happening Now Before the Sen. Com. on Env’t and Pub. Works*, 113th Cong. 3, 6-7 (2013) (statement of Dr. Pielke). Dr. Pielke goes on to state that “[t]he inability to detect and attribute changes in hurricanes, floods, tornadoes and drought does not mean that human-caused climate change is not real or of concern.” *Id.* at 2.

21. *See* John Walsh et al., *Ch. 2: Our Changing Climate*, in CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT 19, 41 (Jerry M. Melillo et al. eds., U.S. Global Change Research Program 2014), *available at* <http://nca2014.globalchange.gov/report/our-changing-climate/introduction>. The intensity, frequency, and duration of North Atlantic hurricanes, as well as the frequency of the strongest (Category 4 and 5) hurricanes, have all increased since the early 1980s. *Id.*

declarations per year over the last decade, as shown in the following table.²²



All but a handful of these disasters involved meteorological events such as hurricanes, tornados, ice storms, and heavy rains. According to the NFIP, 90 percent of all natural disasters in the United States involved flooding.²³

While the number of disaster declarations has increased dramatically, this only specifies the number of times that a state governor has persuaded the president to declare a disaster, based on the governor's certification that the "disaster is of such severity and magnitude that effective response is beyond the capabilities of the State and the affected local governments and that Federal assistance

22. See *Hearing on Climate Change: It's Happening Now Before the U.S. S. Comm. On Env't and Pub. Works*, 113 Cong. 17 (2013) (testimony of Franklin W. Nutter, President, Reinsurance Association of America), available at http://www.epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore_id=f86b767e-7a71-48b4-8eef-7bd9ad1d3884.

23. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-14-297R, OVERVIEW OF GAO'S PAST WORK ON THE NAT'L FLOOD INS. PROGRAM 3 (2014). See also ASS'N OF STATE FLOODPLAIN MANAGERS, FLOOD MAPPING THE NATION: A COST ANALYSIS FOR THE NATION'S FLOOD MAP INVENTORY 3 (2013) (citing NAT'L RESEARCH COUNCIL, MAPPING THE ZONE: IMPROVING FLOOD MAP ACCURACY (The National Academies Press 2009)).

is necessary.”²⁴ Some argue that declarations may be influenced by political considerations perhaps more than by the magnitude of the event.²⁵ Additionally, declarations can arise from events with a small geographic footprint, such as a small town demolished by a tornado.²⁶ On the other hand, hurricanes generally cause much more widespread damage and can trigger multiple declarations in all of the states along the east coast of the United States, as was the case for Hurricane Floyd.²⁷ Accordingly, the number of presidential disaster declarations may not be a good indicator of the increase in disaster losses.

The growth in property losses from meteorological events has also been documented by reinsurance companies. Munich Re, for

24. Robert T. Stafford Emergency Assistance and Disaster Relief Act, Pub. L. No. 93-288, 88 Stat. 143 § 401(a) (1974) (codified as amended at 42 U.S.C. §§ 5121 *et seq.* (2012)) [hereinafter Stafford Act]; *See also* 42 U.S.C. § 5170 (2012).

25. *See* Rick Sylves & Zoltán I. Búzás, *Presidential Disaster Declaration Decisions, 1953-2003: What Influences Odds of Approval?*, 39 ST. AND LOCAL GOV'T REV. 3, 14 (2007).

26. On May 22, 2011, a three-quarter of a mile wide tornado struck Joplin, and continued for approximately six miles. There were over 150 fatalities and more than 7,000 structures damaged or destroyed. <http://www.ustornadoes.com/2013/05/22/joplin-missouri-ef5-tornado-may-22-2011/>. The tornado was declared major disaster FEMA-1980-DR-MO.

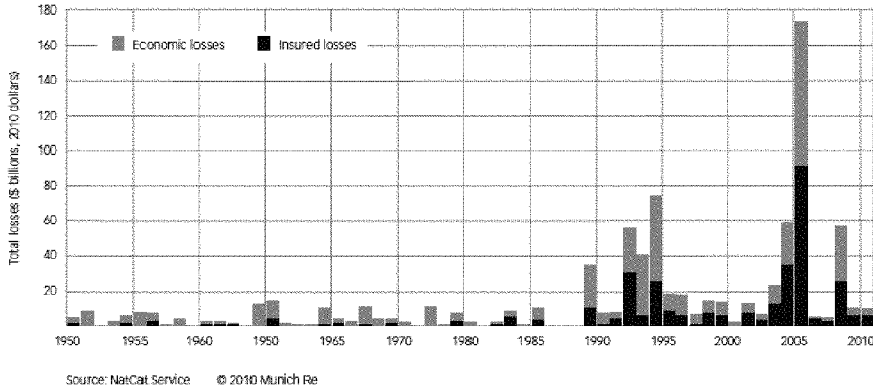
27. FEMA-1295-DR (New Jersey); Major Disaster and Related Determinations, 64 Fed. Reg. 52,314-15 (Sept. 28, 1999); FEMA-1296-DR (New York); Major Disaster and Related Determinations, 64 Fed. Reg. 52,316 (Sep. 28, 1999); FEMA-1294-DR (Pennsylvania); Major Disaster and Related Determinations, 64 Fed. Reg. 52,317 (Sept. 28, 1999); FEMA-1293-DR (Commonwealth of Virginia); Major Disaster and Related Determinations, 64 Fed. Reg. 52,318-19 (Sept. 28, 1999); FEMA-1297-DR (Delaware); Major Disaster and Related Determinations, 64 Fed. Reg. 54,015-16 (Oct. 5, 1999); FEMA-1299-DR (South Carolina); Major Disaster and Related Determinations, 64 Fed. Reg. 54,017 (Oct. 5, 1999); FEMA-1302-DR (Connecticut); Major Disaster and Related Determinations, 64 Fed. Reg. 54,893 (Oct. 8, 1999); FEMA-1300-DR (Florida); Major Disaster and Related Determinations, 64 Fed. Reg. 54,893-94 (Oct. 8, 1999); FEMA-1303-DR; (Maryland); Major Disaster and Related Determinations, 64 Fed. Reg. 54,895 (Oct. 8, 1999); FEMA-1292-DR (North Carolina); Major Disaster and Related Determinations, 64 Fed. Reg. 56,348 (Oct. 19, 1999); FEMA-1305-DR (New Hampshire); Major Disaster and Related Determinations, 64 Fed. Reg. 58,412-13 (Oct. 29, 1999); FEMA-1308-DR (Maine); Major Disaster and Related Determinations, 64 Fed. Reg. 66,915-16 (Nov. 30, 1999).

example, published a table of the total annual insured and uninsured property losses caused by catastrophic events over the last 60 years:²⁸

Figure 1: Significant US catastrophe losses (1950-2010)

Losses (\$1 billion economic loss and/or 50 fatalities)

Overall losses from US significant catastrophes in 2010 totaled \$8.6bn; insured losses totaled \$6.3bn.



For the first 40 of these years, from 1950 to 1990, there was no year in which annual disaster losses reached \$15 billion, and, indeed, annual disaster losses before 1990 were well under \$5 billion 75 percent of the time.²⁹ But in the 22 years since 1990, disaster losses have more than doubled.³⁰ Annual disaster losses have exceeded \$10 billion more than 75 percent of the time.³¹ And the scale of the ‘big disaster year’ has surged dramatically as well. Disaster losses exceeded \$40 billion in 1993, 1994, 1995, 2004, 2005, 2008,³² and (though not shown on the chart) 2012 - due to Superstorm Sandy.³³

Another major reinsurer, Swiss Re, tells the same story. Swiss Re focused only on the period from 1970 on - and so includes the impact of Hurricane Sandy:³⁴

28. See Munich Reinsurance, NatCat Services, <http://www.munichre.com/natcatservice>.

29. *Id.*

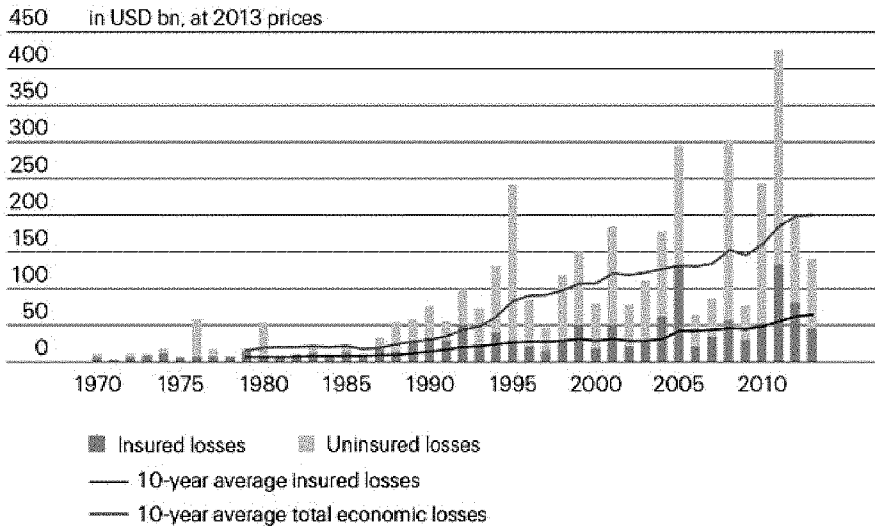
30. *Id.*

31. *Id.*

32. *Id.*

33. See Dolye Rice, Hurricane Sandy, *Drought Cost U.S. \$100 Billion*, USA Today, JAN. 25, 2013, available at <http://www.usatoday.com/story/weather/2013/01/24/global-disaster-report-sandy-drought/1862201/>.

34. See ANDREW CASTALDI, SWISS RE, WHILE LOSSES ARE GETTING BIGGER, THE WORLD IS GETTING SMALLER 6 (2014), available at

Figure 1: Insured losses vs uninsured losses, 1970–2013

Economic loss = insured + uninsured losses

Source: Swiss Re Economic Research & Consulting

Note that both Munich Re and Swiss Re use inflation-adjusted dollars, so this growth in disaster losses is not caused by inflation. Nor can it be explained simply by population growth, as the increase in disaster damages is much higher than the doubling of the population of the United States from 150,697,361 people in 1950 to 308,745,538 people in 2010.³⁵

In recognition of the past and projected increase in disaster damage, on November 1, 2013, President Obama issued Executive Order 13653, Preparing the United States for the Impacts of Climate Change. The Order required agencies, including FEMA, to review “land and water related policies, programs, and regulations that may affect watersheds, natural resources, ecosystems, and communities that depend on them.”³⁶ The Order directed agencies to “focus on

<https://www.amis.com.mx/InformaWeb/Documentos/Archivos/AndrewCastaldi.pdf>.

35. U.S. CENSUS BUREAU, CPH-1-1, UNITED STATES: 2010: SUMMARY POPULATION AND HOUSING CHARACTERISTICS, 2010 CENSUS OF POPULATION AND HOUSING 2 (2013); U.S. CENSUS BUREAU, 1 CENSUS OF POPULATION: 1950, NUMBER OF INHABITANTS XIV (1952).

36. Exec. Order No. 13,653, 78 Fed. Reg. 66,819, 66,820 (Nov. 6, 2013).

program and policy adjustments that promote the dual goals of greater climate resilience and carbon sequestration, or other reductions to the sources of climate change.”³⁷ It also created the Council on Climate Preparedness and Resilience in helping the efforts of regions, states, local governments, and tribes to:

- (i) identify and seek to remove or reform barriers that discourage investments or other actions to increase the Nation’s resilience to climate change while ensuring continued protection of public health and the environment;
- (ii) reform policies and Federal funding programs that may, perhaps, unintentionally, increase vulnerability of natural or built systems, economic sectors, natural resources, or communities to climate change related risks;
- (iii) identify opportunities to support and encourage smarter, more climate resilient investments by States, local communities, and tribes, including by providing incentives through agency guidance, grants, technical assistance, performance measures, safety considerations, and other programs....³⁸

In recognition of the potential impact of climate change on the financial strength and viability of the NFIP, FEMA put forth its Climate Change Adaptation Policy Statement³⁹ in which FEMA resolved to undertake a study on the impacts of climate change on the NFIP and incorporate climate considerations in the NFIP reform effort and grant investment strategies. FEMA commissioned a study, *The Impact of Climate Change and Population Growth on the National Flood Insurance Program through 2100*, which looked at how existing climate change data⁴⁰ and population growth

37. *Id.* at 66,820.

38. *Id.* at 66,819.

39. An agency-wide directive to integrate climate change adaption planning and actions into Agency programs, policies, and operations. FEMA, 2011-OPPA-01, FEMA CLIMATE CHANGE ADAPTATION POLICY STATEMENT (2012), available at http://www.fema.gov/media-library-data/20130726-1919-25045-3330/508_climate_change_policy_statement.pdf.

40. The report used assessments from the *United States Climate Change Science Program (USCCSP)* and the *Intergovernmental Panel on Climate Change (IPCC)*. FEMA CLIMATE REPORT, *supra* note 9, at vii, ES-1-2.

projections in coastal and riverine regions⁴¹ are likely to affect Special Flood Hazard Areas (“SFHAs”), the number of NFIP policyholders, premium rates, and average loss cost per policy, through 2100.⁴² The report generally found that as sea level rises, SFHAs are projected to increase significantly across the nation, with the number of policyholders projected to double by 2100.⁴³

Finally, in May 2014, the White House published the National Climate Assessment that included, for the first time, an express acknowledgement that climate change is happening at an alarming rate and is having a real impact on multiple levels.⁴⁴ As noted in this report:

Decisions about how to address climate change can be complex and responses will require a combination of adaption and mitigation actions. Decision-makers – whether individuals, public officials or others – may need help integrating scientific information into adaption and mitigation decisions.⁴⁵

The increasing cost of “natural” disasters, and the increasing likelihood that these costs will increase further if nothing is done, demands that we review how the NFIP,⁴⁶ the nation’s principal flood mitigation program, will adapt and respond to the increasing flood risk. This article illustrates how difficult it will be to base flood insurance premiums paid by property owners on the current, actuarial, risk of damage due to flood - let alone the greater flood risks now being projected. Basing floodplain management requirements on projections of flood risk pose similar challenges.

41. A detailed region-by-region assessment was not intended, instead the study focused on U.S. coastal and riverine areas of greatest population and largest inventory of at-risk properties. *Id.* at ES-1.

42. *See id.*

43. *Id.* at 5-27.

44. *See generally*, CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT, *supra* note 21.

45. Richard Moss et al., *Ch. 26: Decision Support, Connecting Science, Risk Perception, and Decisions*, in CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT 621 (Jerry M. Melillo et al. eds., U.S. Global Change Research Program 2014), *available at* <http://nca2014.globalchange.gov/report/regions/coasts>.

46. NFIP, *supra* note 14.

III. WHAT CAN YOU DO TO BUILD DISASTER RESILIENCE?

We begin by summarizing the different techniques or actions available to governments to increase disaster resilience. Natural disasters, such as tornados, earthquakes, floods, windstorms, hurricanes, tsunamis, ice storms, and wildfires may be called “natural”⁴⁷ or even characterized as “acts of God.”⁴⁸ But natural disasters are in part man-made. These events become catastrophes only because people built homes, businesses, and infrastructure in ways and in places where they would be harmed by naturally occurring events.

Nearly all “natural disasters” feature some human contribution, whether it be poor construction standards (as in Lisbon [1755 earthquake]) the channeling of a mighty river (as in the 1927 [Mississippi River] flood), or shoddy levees and urban sprawl (as in New Orleans [in 2005]).⁴⁹

Generally, it is not possible to reduce the frequency of ice storms or heavy rains in a river basin, or to steer hurricanes away from populated areas.⁵⁰ Rather, building disaster resilience in a community requires either moving or removing vulnerable structures and facilities from harm’s way, or building stronger structures or facilities so that they are not damaged when the natural disaster event occurs. There are really only a few tools that can be used to build disaster resilience, but the way these tools can be implemented can

47. For example, a major disaster under the Stafford Act is defined as any “*natural catastrophe* ... or, regardless of cause, any fire, flood, or explosion,” that meets the other criteria that allow the president to declare one. Stafford Act, §102(2); 42 U.S.C. § 5122(2).

48. Gilbert Fowler White, *Human Adjustment to Floods: A Geographical Approach to the Flood Problem in the United States*, in UNIV. OF CHI. DEP’T OF GEOGRAPHY RESEARCH SERIES 2 (Wesley Calif ed., 1964).

49. DANIEL FARBER ET AL., *DISASTER LAW AND POLICY* 3 (Aspen Press 2d ed. 2010).

50. See JAMES ROGER FLEMING, *FIXING THE SKY: THE CHECKERED HISTORY OF WEATHER AND CLIMATE CONTROL* 151-52 (2010). In October 1947, GE, along with the U.S. Army, led “Project Cirrus” which consisted of “bomb[ing] the heart of the [hurricane] with 80 pounds of dry ice and drop[ing] 100 pounds more into two embedded convection towers” to see if this ‘hurricane bursting’ would reduce its winds or redirect it. *Id.* at 151. Hurricane King made a “hairpin” turn west and struck the coast of the Georgia and South Carolina border. A tree fell killing one person and caused more than \$32 million in damage. Georgians were “pretty sore at the army and navy for fooling around with the hurricane.” *Id.* at 152.

vary dramatically depending on specific natural threats being examined.

A. Spread Public Information About Risk

First, it is very important to spread public information about the risks of flooding and other hazards to communities, homes, and businesses. If people do not know that a risk exists or how big it is, they will not take steps to protect themselves and their property from it, and they will not know how to protect themselves. Taking these steps is particularly important for events that occur relatively infrequently in a particular geographic area.⁵¹ Thus, it is important to know whether a building or pipeline is located in an area with a high risk of flooding. One of the three prongs of the NFIP includes the development of flood maps across virtually the entire country, specifying the areas in which there is a “Special Flood Hazard.”⁵² Armed with knowledge that there is a special flood hazard in an area, property owners can decide whether to build elsewhere or to elevate structures so that they will not suffer damage. These “Flood Insurance Rate Maps”⁵³ also serve to determine which properties are subject to additional insurance, building code, and land use planning requirements discussed below.

B. Adopt and Enforce Building Codes

Second, governments can require that buildings must meet construction standards so that they are not blown off their foundations or lose their roofs in high winds and have windows that can withstand winds of a certain level. Building standards and codes may also be adopted by professional standard-setting organizations such as the American Society of Civil Engineers, the International Electrotechnical Commission, or the Underwriters’ Laboratories.

51. *Harris Stanley Coal & Land Co. v. Chesapeake & Ohio Ry. Co.*, 154 F.2d 450, 453 (6th Cir. 1946). Judge Simons notes: “It may be that such a disaster could occur only upon a concatenation of circumstances of not too great probability, and that the odds are against it. It is common experience, however, that catastrophes [sic] occur at unexpected times and in unforeseen places... A court of equity will not gamble with human life, at whatever odds, and for loss of life there is no remedy that in an equitable sense is adequate.” *Id.*

52. NFIP, 42 U.S.C. § 4101.

53. *Id.* 44 CFR § 59.1 (Definition of “Flood Insurance Rate Map (FIRM)).

Building codes can require that buildings be elevated in flood hazard areas. Requirements of this type are legion and can be exceptionally specific. Building codes may require the use of hurricane clips in hurricane-prone areas to help assure that the roof does not blow off during high winds.⁵⁴ Again, in high wind areas, building codes may require that mobile homes be affixed to their foundations with metal clamps to reduce the likelihood that they will be blown off their foundations in high winds.⁵⁵ In the central part of the United States where tornados are frequent, some local communities require that mobile home sites have a shared tornado shelter⁵⁶ or for individual homes, FEMA provides guidance for communities to build safe rooms - located underground or in the interior of the house with reinforced walls.⁵⁷ With respect to flood risk, floodplain management ordinances include requirements to install flood vents in crawl spaces and lower enclosures⁵⁸ or to construct breakaway walls below the lowest floor of an elevated structure.⁵⁹ In most communities in the United States, the floodplain management ordinances have been adopted to meet minimum “Requirements for Floodplain Management Regulations” set forth in FEMA’s regulations as a condition to community participation in the NFIP. Some

54. See Florida Building Code, Fla. Stat. 553.844, Sec. 201.3 (2014). For example, in Florida, when a roof is replaced on a building located in a “wind-borne debris region” the roof framing shall be strengthened by adding metal connectors, clips, straps, and fasteners such that the performance level equals or exceeds uplift capacities...” *Id.*

55. See Minn. R. 1350.1200-3100. For example, “Anchoring equipment exposed to weathering shall have a resistance to weather deterioration at least equivalent to that provided by a coating of paint or zinc on steel of not less than 0.625 ounces per square foot on each side of surface” with different “allowable soil bearing pressures depending on the soil component of the foundation.” See also, 44 C.F.R. § 60.3(b)(8) (2014).

56. See David Lieb, *Safe Room Mandates Remain Rare in Tornado States*, THE ASSOCIATED PRESS, May 24, 2013, <http://bigstory.ap.org/article/safe-room-mandates-remain-rare-tornado-states>. “A Wichita, Kan., ordinance adopted in 1994 requires storm shelters in existing mobile home parks with at least 20 homes and in new parks with at least 10 mobile homes. A 2000 ordinance adopted in Wichita’s home of Sedgwick County also required storm shelters for all new mobile home parks with space for at least 10 homes.” *Id.*

57. See FEMA, P-361, DESIGN AND CONSTRUCTION GUIDANCE FOR COMMUNITY SAFE ROOMS (2d ed. 2008).

58. 44 C.F.R. § 60.3(c)(5) (2014).

59. 44 C.F.R. § 60.3(e)(5) (2014).

communities have also strengthened their floodplain management ordinances in order to qualify all property owners in the community for premium discounts available under FEMA's "Community Rating System."⁶⁰

A key feature of building codes generally, and of floodplain management regulations specifically, is that they normally apply only to new construction or very significant repairs/ renovations of existing structures.⁶¹ It can be exceptionally expensive to retrofit existing structures to meet newly adopted building code requirements, and building owners may not be able to afford the cost of those retrofits. So existing structures are "grandfathered," meaning compliance with new codes is not required until triggered by a significant rebuilding or renovation project. In the NFIP and FEMA's Minimum Requirements for Flood Plain Management Regulations, either "substantial damage" or a "substantial improvement," defined as damage or improvement which costs 50 percent or more of the market value of the property, will trigger a requirement that the entire building be elevated and otherwise modified in order to receive a building permit.⁶² As a result, the vulnerability of different structures to hazards, including flooding, will vary widely in a community, with newer structures generally

60. Tulsa, Oklahoma cleared more than 900 buildings from its flood plains and the average premium discount for policies in its SFHA is \$583. *See* FEMA, FEDERAL INSURANCE AND MITIGATION ADMINISTRATION COMMUNITY RATING SYSTEM FACT SHEET 1 (2014), available at http://www.fema.gov/media-library-data/1395661546460-d6859e8d080fba06b34a6f1a4d0abdba/NFIP_CRS_March+2014+508.pdf.

61. *See generally e.g.*, INTERNATIONAL CODE CONSORTIUM, ICC IBC (2012); INTERNATIONAL BUILDING CODE (2011).

62. 44 C.F.R. § 59.1 (2014), defining "substantial damage" and "substantial improvement;" *see also* 44 C.F.R. § 60.8 (2014) (incorporating the definitions of 44 C.F.R. § 59.1 into FEMA's Part 60 Regulations), and, *e.g.*, 44 C.F.R. § 60.3(c)(2)-(3), (5), (7)-(8), (10) (2014) (imposing additional building elevation and construction requirements on new or substantially improved structures). These minimum requirements only look to the cost of improvements built in a single year. Communities can obtain flood insurance discounts if they have defined "substantial improvement" as the total cost of improvements over, say, a three-year period. FEMA, NATIONAL FLOOD INSURANCE PROGRAM COMMUNITY RATING SYSTEM COORDINATOR'S MANUAL 430-518, OMB BULL. NO.1660-0022, available at http://www.fema.gov/media-library-data/1406897194816-fc66ac50a3af94634751342cb35666cd/FIA-15_NFIP-Coordinator-Manual_2014.pdf (last visited Nov. 16, 2014).

built stronger and higher, and older structures built to less protective building codes less resilient to disaster events.⁶³

C. Adopt and Enforce Land Use Planning Ordinances

Third, where there is information about the specific locations in an area that are vulnerable to risks, communities can adopt and enforce ordinances or regulations that limit construction of structures, facilities, or infrastructure. For example, Florida has adopted state building code requirements that vary depending on whether structures are located in coastal areas subject to high winds from hurricanes and tropical storms.⁶⁴ In areas in the urban/forest interface, where there is a severe risk of wildfires, codes include minimum distances between buildings and the forest,⁶⁵ and construction of fire ponds to give firefighters a source of water with which to combat a blaze.⁶⁶

FEMA's Requirements for Floodplain Management Regulations are major components of a community's land use planning program because community ordinances must limit or restrict development in SFHAs shown on the Flood Insurance Rate Map. If a property is located in an area which is mapped as an SFHA, then construction on that property must comply with specific requirements that varies depending on the flood risk information provided on the map including: the height of the "base flood elevation," whether the

63. *E.g.*, Am. Soc'y of Civil Eng'rs, ASCE 7: Minimum Design Loads for Buildings and Other Structures (2nd ed. 2003); 49 C.F.R. § 193.2013 (2014).

64. Fla. Stat. § 1609.2 (2010).

65. Cal. Code Regs. tit. 14, § 1299.03 (2013), which requires "a distance of not less than 30 feet on each side of the building or structure or to the property line, whichever is nearer." Defensible space is required to be maintained at all times, whenever flammable vegetative conditions exist. One hundred feet (100 ft.) of defensible space clearance shall be maintained in two distinct "Zones" as follows: "Zone 1" extends thirty feet (30 ft.) out from each "Building or Structure," or to the property line, whichever comes first; "Zone 2" extends from thirty feet (30 ft.) to one hundred feet (100 ft.) from each "Building or Structure," but not beyond the property line.

66. Town of South Thomaston's Fire Protection Ordinance, requires a developer of a subdivision to construct a 250,000 gallon fire pond within 2,000 feet of any proposed development if no adequate water supply exists. *Curtis v. Town of S. Thomaston*, 708 A.2d 657 (Me. 1998).

property is subject to wave action in coastal areas,⁶⁷ and whether the property is located in a “floodway” rather than a “floodplain.”⁶⁸

D. Provide and Strengthen Property Owners’ Incentives to Mitigate Risk

1. Property Owners Responsible for Real Economic Cost of Risk

Economic theory holds that the best way to assure that property owners will protect themselves from the risk of disaster events is if the property owners pay the full cost incurred when the property is damaged from disasters.⁶⁹ Where the costs incurred by property owners are relatively infrequent, as in the case of disasters that may be experienced (in a given location) only once in a generation or less, it will be difficult for property owners to assess the actual risk of loss to a property. However, if insurance is available, and if premiums are actuarially based, then the purchase of insurance by the property owner will internalize the expected cost of disaster events. Premiums will be more expensive in more risky areas. Premiums for properties that are built to withstand natural forces - built to withstand stronger winds and elevated above expected flood heights - will be cheaper than premiums on properties located in higher risk areas or built of flimsy materials below the expected flood level.

In theory, the difference in insurance premiums will cause a property owner to invest in mitigation measures, such as elevation, structural enhancements, and installation of windows with a higher wind rating, because it is more cost effective to invest in mitigation than to continue to pay high insurance premiums.⁷⁰ The theory breaks down, however, when the property owner does not pay the full actuarial cost of insurance for the risk, and it also breaks down

67. 44 C.F.R. § 60.3(e)(4) (2014).

68. Flood plain or flood-prone area means any land area susceptible to being inundated by water from any source. A regulatory floodway is the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than the designated height. 44 C.F.R. § 59.1 (2014).

69. George Priest, *Ch. 12: The Government, the Market, and the Problem of Catastrophic Loss*, in *DISASTER LAW AND POLICY* 332-34 (Daniel Farber et al. eds., Aspen Press 2010).

70. The cost of inaction is 4 to 10 times greater than the cost associated with preventative hazard mitigation. See Moser, *supra* note 2, at 595.

when the property owner is not responsible for the full costs incurred as a result of a natural catastrophe. If property owners believe that they will be bailed out by disaster assistance in the event of disaster damage, they will have less of an incentive to protect themselves and their property from potential hazards.

Accordingly, two of the ways that governments can encourage property owners to reduce the vulnerability of their homes and businesses is by reviewing insurance premiums and raising premiums that are below actuarial levels and by limiting the ability of property owners to avoid paying the cost of disaster losses themselves. We will demonstrate a number of the ways that Congress and the Federal Emergency Management Agency have somewhat inconsistently attempted to encourage property owners to bear more of the risk of damage to their own properties in Part III below.

2. Public Encouragement through Funding of Mitigation Activities

Finally, government authorities can encourage investments in mitigation by offering to pay for some of, much of, or even all of the cost of mitigation. Partial funding can take the form of funding of mitigation planning, where the government develops information about the nature of the risk and identifies the possible projects that could reduce the risk.⁷¹ The government can provide funding by providing tax credits for (usually a portion of) the cost of mitigation measures⁷² or by allowing property owners to deduct the cost of mitigation measures from the income used to compute income

71. Pierce County, Washington, maintains over 80 miles of river levees and each year officials mail informational brochures to all flood plain residents. FEMA, FEDERAL INSURANCE AND MITIGATION ADMINISTRATION COMMUNITY RATING SYSTEM FACT SHEET 1 (2014), *available at* http://www.fema.gov/media-library-data/1395661546460-d6859e8d080fba06b34a6f1a4d0abdba/NFIP_CRS_March+2014+508.pdf.

72. For pre-flood mitigation assistance there are some exemptions from property tax increases for homeowners who choose to elevate their property. In Dare County, North Carolina, for example, where many homes were built in the late 1800s to early 1900s, homeowners were encouraged to elevate their homes in response to frequent flooding. Dare County chose not to include costs to elevate the structures into its tax assessment, despite elevation increasing the assessed value of the home. U.S. ARMY CORPS OF ENG'RS, LOCAL FLOOD PROOFING PROGRAMS 41 (2005), *available at* <http://www.usace.army.mil/Portals/2/docs/civilworks/Project%20Planning/nfpc/Local%20Flood%20Proofing%20Programs%202005.pdf>.

taxes.⁷³ And not infrequently, particularly after disasters, federal or state governments will make funds available to pay for approved disaster mitigation measures.⁷⁴

In sum, there are really only a few ways that governments can encourage the mitigation of disaster risk: by *providing information* about the risk, by *requiring* property owners, through land use planning ordinances and building codes, to build stronger in safer places, and by *providing incentives* for mitigation either by assuring that property owners pay for the damages to their own property caused by disasters, by assuring that insurance premiums are based on actuarial principles, or by funding all or a portion of the cost of mitigation planning and of mitigation projects. We have shown that the National Flood Insurance Program includes aspects of all of these techniques. We now examine in greater detail the efforts of Congress and the Federal Emergency Management Agency to encourage mitigation of flood risk, and how those efforts are complicated and frustrated when flood levels rise significantly over time.

IV. INCENTIVES FOR DISASTER MITIGATION IN THE NATIONAL FLOOD INSURANCE AND DISASTER ASSISTANCE PROGRAMS

A. National Flood Insurance Program

Flood insurance was largely unavailable before enactment of the National Flood Insurance Act in 1968.⁷⁵ There were a number of reasons for the failure of the private insurance market- including inadequate information about the risk, the very high actuarial cost of the risk in areas where property owners were aware of flood risk, and the refusal of property owners to pay for flood insurance if the property had not recently experienced flooding.⁷⁶ The National

73. 26 U.S.C. § 139(g) (2012). “Gross income shall not include any amount received as a qualified disaster mitigation payment... any amount which is paid pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act... to or for the benefit of the owner of any property for hazard mitigation with respect to such property. Such term shall not include any amount received for the sale or disposition of any property.” *Id.*

74. 44 C.F.R. § 206.226(e) (2014).

75. 44 C.F.R. § 59.2 (2014).

76. Ernest B. Abbott, *Floods, Flood Insurance, Litigation, Politics – and Catastrophe: The National Flood Insurance Program*, 1 SEA GRANT L. & POL’Y J. 129, 131-32 (2008).

Flood Insurance Act of 1968 recognized that “[m]any factors make it uneconomic for private insurance industry alone to make flood insurance available to those in need of such protection on reasonable terms and conditions,” but nonetheless concluded that:

A program of flood insurance with large-scale participation of the Federal Government and carried out by private insurance industry is feasible and can be initiated.⁷⁷

There were three components to this “program of flood insurance”—the “NFIP” created by the Act.

- Risk Identification/Assessment: Mapping of flood-prone areas in communities which joined the NFIP. Knowing the location and probable elevation of the flood risk is critical both to determining actuarial insurance rates and to guiding efforts to reduce flood risk through land use and building requirements.⁷⁸
- Risk Mitigation: The NFIP requires participating communities to adopt and enforce a set of floodplain management ordinances that are consistent with “minimum” floodplain management requirements promulgated by FEMA. These flood plain management ordinances were the main reason that flood insurance could become affordable: they were to assure that new and substantially improved structures would be built in less flood-prone areas, or elevated so that they would generally not suffer damage due to flooding.⁷⁹
- Insurance: With flood risk information available, and with participating communities reducing flood risk through enforcement of flood plain management regulations, the federal government was authorized to arrange for the sale of federally

77. 42 U.S.C. § 4001(b) (2012).

78. NFIP, 42 U.S.C. § 4101.

79. *Id.* at § 4102; *see* 44 CFR Part 60, Subpart A.

supported flood insurance in communities which have joined the program.⁸⁰

1. “Grandfathering” and the NFIP

From the outset, the Flood Insurance Act contemplated a two-tier classification system consisting of actuarial rates for new and substantially improved structures, on the one hand, and subsidized rates for structures in existence before a community joined the NFIP and FEMA provided a Flood Insurance Rate Map on the other.⁸¹ Thus, preexisting “grandfathered” properties had access to subsidized rates that were lower than the actuarial risk of the property; new or substantially improved structures had to pay actuarial rates.⁸² However, because the new or substantially improved properties were required to comply with flood plain management ordinances, the actuarial rates for new/improved properties were substantially *lower* than the *subsidized* rates of grandfathered properties.⁸³

The idea was that, over time, the subsidized properties would slowly be eliminated through attrition, as a result of code compliance triggered by substantial damage or substantial improvements. This hope has not yet been realized. It appears that most damage to property and most remodeling activities, end up costing less, or are estimated to cost less, than the market value of the property - particularly after property owners discover that a project costing more than 50 percent of market value will trigger very expensive requirements to elevate an entire building.⁸⁴ As of June 2012, there

80. *Id.* at § 4011 and 4012(c).

81. Abbott, *supra* note 76, at 131-33.

82. *Id.* at 133.

83. Owners of a grandfathered property that in fact complied with flood plain management standards would have access to the lower actuarial rates simply by demonstrating, on an Elevation Certificate, that it met those requirements.

84. Some property owners or builders may try to avoid triggering the 50 percent substantial improvement rule by applying for a permit for only part of the job, then later applying for another permit to finish the work. FEMA requires that the entire improvement project be counted as one. See generally FEMA, UNIT 8: SUBSTANTIAL IMPROVEMENT AND SUBSTANTIAL DAMAGE, available at http://www.fema.gov/pdf/floodplain/nfip_sg_unit_8.pdf In addition, depending on the community, applications may be counted over the course of a year, over the period of five years, ten years, or the life of the structure. CRS Coordinator’s Manual, *supra* note 62. When improvements and repairs total 50 percent of the

were approximately 1,153,000 subsidized policies⁸⁵ accounting for roughly 20 percent of the 5.6 million policies in place.⁸⁶

More significantly, there are several other categories of “grandfathered” properties that are created by changes in flood maps over time - and in most cases, newer maps show increased areas of flood risk and increased elevations of expected flooding. First, any errors in the initial flood maps tended to be biased against showing the full flood risk. Maps that erroneously placed property into higher risk flood zones tended to be corrected by property owners more than maps that placed property outside of flood risk areas.⁸⁷ Second, upstream development will generally increase flood levels and the area subject to flooding since water moves more rapidly downstream over roads and rooftops than in forests and grasslands.⁸⁸ Third, levees that were initially credited as providing flood protection, were not necessarily operated and maintained so that they could be

value of the building, a building permit should not be issued unless the entire building is brought into NFIP compliance. 44 CFR § 60.3.

85. U.S. GOV'T ACCOUNTABILITY OFFICE, *supra* note 23, at 19.

86. Craig Fugate's testimony before the Committee on Banking, Housing and Urban Affairs Subcommittee on Economic Policy, on September 18, 2013, indicated that approximately 20 percent of policyholders, representing 1.1 million of the 5.6 million NFIP policies, now pay subsidized rates. *Implementation of the Biggert-Waters Flood Insurance Reform Act of 2012: One Year After Enactment Before the Subcomm. on Economic Policy of the S. Comm. On Banking, Housing, and Urban Affairs*, 113th Cong. (2013) (written testimony of Craig Fugate, Administrator, FEMA).

87. Generally, appeals of new flood map data are filed by property owners whose property is mapped into an SFHA, or a higher flood risk area in an SFHA, and becomes subject to new flood insurance purchase requirements, higher insurance premiums, and new or more stringent floodplain management requirements applicable to new or substantially improved construction. By contrast, property owners generally do not appeal a flood map that does not place a property in an SFHA and so imposes no increased regulatory or insurance requirements. Appeal procedures for flood maps are specified at 42 U.S.C. § 4104 and 44 CFR Part 67; an appeal is limited to knowledge or information indicating that the flood areas or flood elevations shown on the map are “scientifically or technically incorrect.” 42 U.S.C. § 4104(b).

88. Managing Future Development Conditions in the National Flood Insurance Program (NFIP), *available at* http://www.fema.gov/media-library-data/20130726-1602-20490-9505/nfip_eval_managing_future_development.pdf

certified as still providing protection from the “base flood” event.⁸⁹ As a result, when new maps are created, the area protected by the ‘decertified’ levee is mapped as an SFHA absent enactment of a statutory exception.

The NFIP determined early on that it should not penalize property owners who built in full compliance with flood plain management regulations and the flood maps in effect when the structure was permitted. Even if new flood maps placed a structure into an SFHA, or raised the elevation of the “base flood” (1 percent chance per year flood), insurance premiums were to be determined with reference to the structure’s elevation and flood plain management compliance with reference to the original flood map.⁹⁰

This has created a new class of “grandfathered” properties, even though they are not eligible for the “pre-FIRM” subsidized rates and are not categorized by FEMA as “subsidized.” These properties have a different form of subsidy: they pay the actuarial rates applicable not to the flood risk they actually face but to the lesser risk shown on the old, superseded maps.⁹¹ FEMA has not tracked the number of grandfathered properties and cannot determine their financial impact on the program.⁹²

But the financial impact of grandfathering is certain to grow as sea level rises and severe weather events become more frequent as a result of climate change. As sea level rises, coastal shores will move inland, changing the existing SFHA. In riverine areas, increased precipitation associated with the effects of climate change will increase the SFHA. FEMA’s Climate Report forecasts that a 6.6-foot rise in sea level will potentially increase SFHAs by 45 percent in riverine SFHA regions, and, assuming a fixed shoreline,⁹³ by 55

89. FEMA’s levee certification criteria are set forth at 44 CFR § 65.10. The criteria include both design and construction standards and requirements for operation and maintenance plans. 44 CFR § 65.10(c) and § 65.10(d).

90. NFIP Map & Zone Grandfather Rules, available as of November 16, 2014 at http://www.fema.gov/media-library-data/20130726-1613-20490-1420/grndfthr_sht.pdf.

91. U.S. GOV’T ACCOUNTABILITY OFFICE, *supra* note 23, at 4.

92. *Id.*

93. *See* FEMA CLIMATE REPORT, *supra* note 9, at 6-2. A fixed shoreline arises where engineering methods such as beach restoration, dredging, seawall, etc. are used to maintain the shoreline, as opposed to allowing the shoreline to recede naturally. *Id.*

percent in coastal SFHA regions over the next 50 to 100 years.⁹⁴ FEMA's climate study notes that for coastal areas, which allow the shoreline to recede, the shore simply moves inland in proportion to sea level rise.⁹⁵ This may not be true for coastal cities that attempt to maintain a fixed shoreline through beach replenishment.⁹⁶ As sea level rises, the SFHA expands, the flatter the land, and the greater the spread of the SFHA. The SFHA engulfs nearby area and property, formerly not within the SFHA will become part of the SFHA.⁹⁷

Under current NFIP policy, these properties are eligible for their original risk classification so long as they were built in compliance with the NFIP at the time of construction. Illustrating the potential magnitude of the problem, FEMA's climate report projects a worst-case scenario of "more than 50 percent, and possibly as many as 75 percent, of the policies in 2100 will be considered 'grandfathered' with respect to their floodplain depth risk classification."⁹⁸ FEMA's climate report predicts that the total number of NFIP policies may increase by approximately 100 percent by the year 2100, or double the number of policyholders it has today.⁹⁹ In the fixed shoreline assumption, the average loss cost per policy may increase by approximately 10 to 15 percent through the year 2020, 20 to 60 percent through the year 2080, and by approximately 90 percent by the year 2100.¹⁰⁰ Individual premiums per policy are expected to increase approximately 20 to 70 percent, in today's dollars, by the year 2100 in order to offset the projected increase in loss cost.¹⁰¹ Premiums would need to increase by approximately 10 to 15 percent through the year 2020 and 10 to 50 percent through the year 2080, given an estimated population increase in the coastal SFHA of 140 percent by the year 2100.¹⁰²

94. *Id.* at 6-1.

95. *Id.* at 5-11.

96. *Id.* at 4-7.

97. *Id.*

98. *Id.* This assumes a 0 percent rebuilding assumption (that homes will not undergo 'significant improvement' in the aftermath of disaster, and thus lose grandfather status). *Id.* at 5-25. It is also based on the assumption that current policies and procedures will not change over the course of this study. *Id.* at 5-26.

99. FEMA CLIMATE CHANGE ADAPTATION POLICY STATEMENT, *supra* note 39, at 2.

100. FEMA CLIMATE REPORT, *supra* note 9, at 6-2.

101. *Id.* at 6-3.

102. *Id.* at 6-2, 6-3.

As the number of policies increases in flood-hazard areas, the NFIP will have greater financial exposure in major flooding events. As FEMA pointed out in its report, “[t]he swing loss payments made from year to year may be larger than the NFIP’s current funding and borrowing structure accommodates.”¹⁰³

2. Financial Performance of the NFIP

For over 35 years the NFIP and its National Insurance Fund managed to limp along as it provided subsidized flood insurance rates, grandfathered rating and coverage to repetitive loss properties.¹⁰⁴ In the first decades, Congress was required to prop up the Flood Insurance Fund with appropriations, but efforts to increase premiums and reduce coverage during the Reagan administration put the program on what appeared to be stable footing. For the 15 years from 1990 until Hurricane Katrina, the program ran without any additional appropriated dollars beyond those collected in insurance premiums.¹⁰⁵ Occasional deficit years required borrowing from the Federal Treasury,¹⁰⁶ but these loans were all repaid in full with interest.¹⁰⁷

However, Hurricanes Katrina and Rita demolished the appearance of financial sustainability that the NFIP had achieved. Total flood claims paid for losses incurred in 2005 exceeded the total losses incurred in all 37 previous years of the program’s existence.

103. *Id.* at 5-27 to -28.

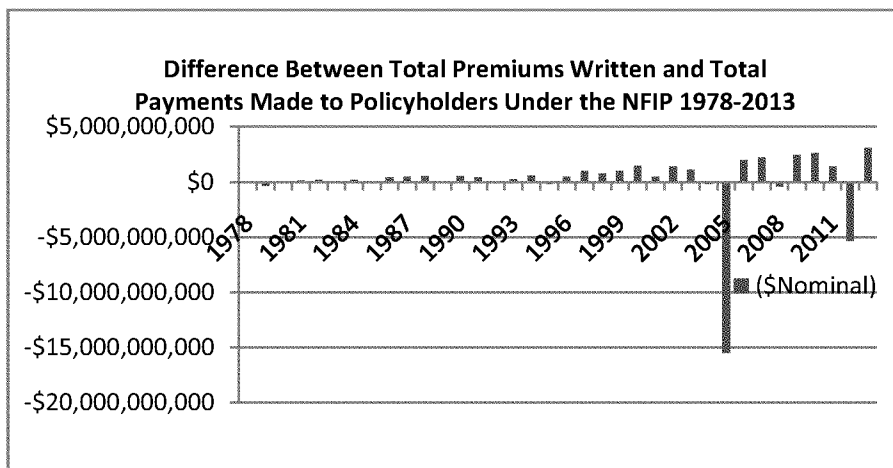
104. *See generally id.* at Chapter 5.

105. *See* RAWLE O. KING, CONGRESSIONAL RESEARCH SERVICE, NATIONAL FLOOD INSURANCE PROGRAM: BACKGROUND, CHALLENGES, AND FINANCIAL STATUS, 17 (June 12, 2012), available at <http://www.washingtonpost.com/wp-srv/business/documents/health-science-NFIP-123110.pdf>. Prior to Katrina, when FEMA borrowed from the Treasury, Congress either retired the debt or FEMA repaid the loans, generally within two years. FEMA’s borrowing authority was less than \$2 billion. Borrowings through 1985 were repaid from congressional appropriations. NFIP did not borrow from 1986 through 1993. Since 1994, FEMA has repaid loans from premium and other income. *Id.*

106. 42 U.S.C. § 4017 (2012).

107. *See A Chronology of Major Events Affecting the National Flood Insurance Program*, FEMA, December 2005, available at http://www.fema.gov/media-library-data/20130726-1602-20490-7283/nfip_eval_chronology.pdf (last visited November 16, 2014). The chronology documents key events in the program history, including Congressional appropriations and major deficit milestones. *See, e.g.*, entries 10.1987, 12/1993, 9/1995, 9/1996.

Table 3: Difference Between Total Premiums Written and Total Payments Made to Policyholders Under the National Flood Insurance Program 1978-2013¹⁰⁸



Congress was forced to increase the maximum amount that the NFIP was allowed to borrow from the Treasury to a total of \$20.775 billion.¹⁰⁹

3. Potential Ways to Increase Financial Viability of NFIP

The sheer size of the NFIP's debt, in the context of major battles in Congress over the federal deficit and federal debt, provoked congressional review on how it might reform the program so that flood insurance could in fact achieve the financial sustainability that had been promised when the National Flood Insurance Act was adopted in 1968. The challenge faced by flood insurance reformers was that there really were, and are, only a few ways to improve the financial sustainability of the flood insurance program. As a matter of logic, reforms must either:

1. Raise more revenue:
 - a. Raise premiums/eliminate subsidies

108. *Statistics by Calendar Year*, FEMA, <https://www.fema.gov/statistics-calendar-year>.

109. NFIP, 42 U.S.C. § 4016(a).

- b. Increase number of Policyholders/policies- and hence increase in premium dollars collected
 - c. Diversify geographic risk¹¹⁰
 - 2. Reduce coverage provided for losses due to flood
 - a. Reduce coverage provided under policy
 - b. Raise deductibles
 - c. Increase private sector participation through reinsurance¹¹¹
 - 3. Reduce the frequency of losses due to flood
 - a. Strengthen Flood Plain Management Regulations
 - i. Provide for climate change considerations in flood plain mapping
 - b. Increase incentives to reduce flood risk
 - i. Provide for climate change considerations for insurance rating purposes
 - ii. Increase funding available for pre-disaster mitigation¹¹²
 - 4. Reduce administrative and other costs
 - a. Reduce litigation expenses by strengthening immunities/preemption¹¹³
 - 5. Establish a reserve fund:
 - a. Annual target equal to 1 percent of the total potential loss exposure¹¹⁴

110. As of September 2013, 61 percent of NFIP policies were in SFHAs, while the percentage of single-family homes in non-SFHAs consisted of about 1 percent. *Id.* at 22.

111. *Id.* at 15.

112. In 2013, FEMA received applications for \$304 million in Flood Mitigation Assistance, more than twice the appropriations received for the program that year. *Id.* at 39. Subsequently, FEMA requested \$400 million in Pre-Disaster Mitigation, combined with \$150 million in base funding for National Flood Insurance Program mitigation grants, representing an increase of \$450 million over the 2014 spending level. *FEMA's Fiscal Year 2015 Budget Request Before the Subcomm. on Emergency Preparedness, Response, and Communications of the S. Comm. on Homeland Security and Governmental Affairs*, 113th Cong. (2014) (prepared statement of Craig Fugate, Administrator, and FEMA).

113. See Standard Flood Insurance Policy, 44 C.F.R. § 61 App. A(1) at Part VII. General Conditions, R. (“Suit Against Us”) and Part IX What Law Governs.

114. At the end of FY 2013, FEMA’s potential loss exposure was \$1.29 trillion; as a result FEMA’s annual target reserve would be \$12.9 billion. U.S. GOV’T ACCOUNTABILITY OFFICE, *supra* note 23, at 10.

b. Annual surcharge for residential and commercial policies

Congress and FEMA had already pursued each of these strategies over the past 40 years to improve the financial results of the NFIP.¹¹⁵ But the \$18 billion deficit caused by Hurricane Katrina¹¹⁶ demonstrated that these efforts did not go far enough. Spurred by the staunch opposition of key legislators to any reauthorization of the National Flood Insurance Program that did not address its financial shortcomings,¹¹⁷ years of efforts to reform the NFIP culminated in major legislation that became law on July 6, 2012: the Biggert-Waters Flood Insurance Reform Act of 2012.¹¹⁸ Before we review the controversy around this legislation, we must summarize the ways in which Congress has addressed the mitigation of flood risk in disaster legislation.

B. Disaster Mitigation under the Stafford Act

Since enactment of the Disaster Relief Act of 1974, Congress has provided funding for emergency response and disaster recovery activities upon declaration of a “major disaster” or “emergency” by the President of the United States.¹¹⁹ The assistance is now provided primarily under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (“Stafford Act”) as amended.¹²⁰ Stafford Act assistance can take the form of direct federal assistance or federal disaster assistance grants to reimburse the costs incurred by state or

115. For a brief history of these efforts, see Ernest B. Abbott, *Floods, Flood Insurance, Litigation, Politics – and Catastrophe: The National Flood Insurance Program*, 1 SEA GRANT L. & POL’Y J 129, 129-142 (2008).

116. ROBERT P. HARTWIG & CLAIRE WILKINSON, INSURANCE INFORMATION INSTITUTE, HURRICANE KATRINA: THE FIVE YEAR ANNIVERSARY, 6 (JULY 2010), available at <http://www.iii.org/sites/default/files/1007Katrina5Anniversary.pdf>.

117. From September 2008 to September 2011, the NFIP has been extended 11 times. KING, *supra* note 105. Dispute over the need to address the cost to taxpayers of the NFIP and its debt led the program to lapse, due to expiration of its authorizing legislation, three times, during this same period. H.R. REP. NO. 112-102, at 19 (2011). In May 2012, the price exacted for a two-month extension of the authorization of the NFIP was elimination of subsidized insurance premiums for second homes. H.R. 5740, as passed by the Senate on May 24, 2012. The House agreed to the Senate amendment on May 30, 2012. KING, *supra* note 105, at 4.

118. BW-12, *supra* note 16.

119. See Disaster Relief Act of 1974, 42 U.S.C. § 5192 (2012).

120. Stafford Act, *supra* note 24.

local governments, Indian tribes, and by certain “governmental type” nonprofit entities¹²¹ in performing emergency work, or in repairing, restoring, reconstructing, or replacing facilities damaged by event declared as a major disaster.¹²² Assistance to “individuals and families” is also available for temporary housing and to address various medical, dental, childcare, funeral expenses, and “other needs” created by the disaster,¹²³ although assistance is capped at approximately \$30,000.¹²⁴ In general, Stafford Act authority to assist state and local governments in protecting lives and property from an “immediate threat” to life, property, and public health and safety is written very broadly,¹²⁵ while the authorities to pay for the damages and losses caused by the disaster are far more narrowly written.¹²⁶

The purpose of the Stafford Act is not just to spur preparedness and provide assistance from disasters. The Stafford Act is also intended to encourage:

[I]ndividuals, States, and local governments to protect themselves by obtaining insurance coverage to supplement or replace governmental assistance; [and]
[E]ncourage hazard mitigation measures to reduce losses from disasters, including development of land use and construction regulations.¹²⁷

Over the years, Congress has included a large number of requirements and incentives intended to spur disaster mitigation efforts by individuals, states, and local governments. Some requirements are multi-hazard in nature; others are directed

121. 44 C.F.R. § 206.221(e) (2014).

122. Stafford Act, §§ 402, 403, 406, 407 and 502; 42 U.S.C. §§ 5170a, 5170b, 5172, 5173, and 5192.

123. *Id.* at § 408(e)(1); 42 U.S.C. § 5174.

124. The Individual and Housing program provides cash grants up to a limit, which is adjusted annually for inflation. 42 USC § 5174(h).

125. *Id.* at § 402-03. 42 U.S.C. § 5170(a)-(b).

126. *Compare* 42 USC § 5170b(a)(provide assistance essential to meeting immediate threats, *including* broad categories of work and services to save lives and protect property), *with* 42 USC § 5172 *and* 44 CFR § 206.226 *and* § 206.228 (specifying specific eligible work and costs).

127. *Id.* at § 101; 42 U.S.C. § 5121(b)(4)-(5).

specifically to mitigation of flood risk. Mitigation and mitigation planning requirements were dramatically expanded in the Disaster Mitigation Act of 2000.¹²⁸ Indeed, the Stafford Act includes so many requirements and incentives that significant bureaucracy and red tape is required to administer them.

1. Requirements / Incentives to Plan for Mitigation

First, as a condition to the availability within a state of any recovery assistance under the Stafford Act, the state must have a FEMA-approved “standard” hazard mitigation plan assessing the risks of hazards within the state, analyzing the state’s vulnerabilities to those risks and the potential losses therefrom, and describing the state’s mitigation strategy.¹²⁹

Second, local governments and Indian tribes must have in place a local or tribal mitigation plan, respectively, in order to be eligible to receive funding for mitigation projects.¹³⁰

Third, the funding available from the Disaster Relief Fund for mitigation projects is considerably enhanced- to 20 percent of the cost of non-mitigation expenditures in response to a major disaster- if the state has applied for and received FEMA approval of an “Enhanced Mitigation Plan” demonstrating that it has developed a comprehensive mitigation program, effectively uses available mitigation funding, and is capable of managing the increased funding.¹³¹

2. Requirements for/Funding of Stronger Construction Practices

FEMA also has powerful discretionary authority when administering its disaster relief grant and loan programs to assure that construction undertaken with disaster assistance grants and loans are in accordance with modern construction standards. Stafford Act Section 323, titled “Minimum Standards for Public and Private Structures,” provides that, “as a condition of receipt of a disaster loan or grant under this Act, the recipient shall carry out any repair or

128. Disaster Mitigation Act of 2000, Pub. L. No. 106-390, 114 Stat. 1552-59 (2000).

129. 44 C.F.R. § 206.226(b) (2014), referencing Standard State Mitigation Plans described in 44 C.F.R. § 201.4 (2014).

130. 44 C.F.R. § 201.6(a)(1); § 201.7(a)(1).

131. *Id.* at § 201.5(a).

construction to be financed with the loan or grant in accordance with applicable standards of safety, decency, and sanitation and in conformity with applicable codes, specifications, and standards.”¹³² The same section also gives FEMA authority to “require safe land use and construction practices, after consultation with State and local government officials.”¹³³

Not only can FEMA *require* compliance with applicable construction and land use standards as a condition of its funding of an otherwise eligible construction project, but FEMA includes the cost of such compliance as part of the disaster assistance.¹³⁴ The very definition of what costs are eligible for federal reimbursement includes the cost of compliance with “applicable codes, specifications and standards.”¹³⁵ In addition, the definition includes, as part of the “net eligible cost” of a repair or reconstruction project, the cost of “floodplain management and hazard mitigation criteria required by the President.”¹³⁶

3. Further Statutory Incentives to Encourage Mitigation/Penalties for Failure to Mitigate

There are a number of additional restrictions on availability of disaster assistance for structures that are damaged by flooding or damaged on multiple occasions. Specifically:

- Virtually no disaster assistance can be provided under the Stafford Act to construct structures in areas mapped as a floodway or in a coastal high hazard area.¹³⁷
- No disaster assistance can be provided for construction/repair of substantial damage to structures in

132. Stafford Act, § 323(a)(1); 42 U.S.C. § 5165(a)(a)(1).

133. *Id.* at § 323(a)(2); 42 U.S.C. § 5165a(a)(2).

134. *Id.* at § 406(e); 42 U.S.C. § 5172(e)(1)(A)(ii).

135. *Id.* For FEMA’s regulations defining what codes, specifications, and standards are “applicable,” see 44 C.F.R. § 206.226(d) (2014). Significantly, these codes must be in writing and in effect prior to the disaster.

136. *Id.*

137. 44 C.F.R. § 9.11(d)(1) (2014). FEMA’s regulations at 44 C.F.R. Part 9 were adopted in response to President Carter’s issuance of Executive Order 11988 in 1977. See Elliot Mittler et al., *AMERICAN INSTITUTES FOR RESEARCH, STATE ROLES AND RESPONSIBILITIES IN THE NATIONAL FLOOD INSURANCE PROGRAM* (Oct. 2006).

Special Flood Hazard Area unless elevated/protected as required by the National Flood Insurance Program.¹³⁸

- No disaster assistance can be provided for repair of previously uninsured structures unless the applicant first agrees to obtain and maintain such insurance as may be reasonably available, adequate and necessary to protect against future loss of the structure.¹³⁹
- No flood disaster assistance can be provided to structures that received flood disaster assistance in a prior disaster unless all previously required insurance has been maintained.¹⁴⁰
- For any structure located in a Special Flood Hazard Area, and designated as such for one year or more, but not covered by an active NFIP policy on the date of the disaster, the amount of the otherwise eligible funding will be reduced by the lesser of the value of the facility or the amount of proceeds which would have been received if covered by such a policy.¹⁴¹

4. FEMA Mitigation Grant Programs

Finally, the Stafford Act includes several programs under which FEMA will fund the lion's share of the cost of disaster mitigation projects. First, FEMA can fund mitigation as part of the repair of disaster damaged facilities.¹⁴² Under this authority, a damaged structure must be repaired with stronger walls, sturdier components, and the like, to reduce the likelihood of similar damage in the future.¹⁴³ The applicant must show that the mitigation measures are cost effective, and the cost of these mitigation measures generally is not more than the cost of simple repair/replacement without

138. *Id.* at § 9.11(d)(2)-(3) (2013).

139. Stafford Act, § 311(a); 42 U.S.C. § 5154(a)(1).

140. *Id.* at § 311(b); 42 U.S.C. § 5154(b). For good measure, Congress adds a special provision prohibiting waiver of requirement for purchase of flood insurance as a condition of the receipt of federal disaster assistance. *Id.* at § 408(c)(3)(B); 42 U.S.C. § 5174(c)(3)(B).

141. *Id.* at § 406(d); 42 U.S.C. § 5172(d).

142. FEMA, POLICY 9526.1, HAZARD MITIGATION FUNDING UNDER SECTION 406 ¶ 7.1 (2010), available at <http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit/hazard-mitigation-funding-under-section-406-0>.

143. Stafford Act, § 406(e); 42 U.S.C. § 5172(e).

mitigation.¹⁴⁴ Statutory authority for this mitigation arises from Section 406 of the Stafford Act and its definition of the “net eligible cost” of repairing or replacing damaged facilities: “net eligible cost” includes the cost of “flood plain management and hazard mitigation criteria required by the President.”¹⁴⁵ In practice, mitigation measures are rarely “required” unless the applicant proposes to include mitigation measures in its reconstruction project. There is no separate source of funding for this work; the cost of mitigation is funded from the same Disaster Relief Fund appropriation provided for Stafford Act disaster assistance expenditures, and the cost of Section 406 mitigation is not separately listed in management reports. As a result, it is not easy to determine how much the federal government pays for this type of mitigation.

Second, Section 404 of the Stafford Act authorizes significant funding of post-disaster mitigation through a separate “Hazard Mitigation Grant Program,” or HMGP.¹⁴⁶ State, local governments, and certain non-profit organizations can be eligible for grants of “not more than” 75 percent of the cost of mitigation projects.¹⁴⁷ These projects must also be shown to be cost effective, but need not be part of the repair or restoration of a damaged portion of a facility.¹⁴⁸

144. There are no program-wide limits on funds, but each project must be cost-effective and approved by FEMA. Mitigation measures may amount up to 15 percent of the total eligible cost of the eligible repair work on a particular project. *Id.* at 406 ¶ 7.2.. Under Section 404 of the Stafford Act, Hazard Mitigation, the President may contribute up to 75 percent of the cost of hazard mitigation measures which reduce the risk of future damage, hardship, loss, or suffering in any area affected by a major disaster. Stafford Act, § 404(a); 42 U.S.C. § 5170c(a).

145. Stafford Act, § 406(e), as in currently in effect. (Section 205(d)(1) of the Disaster Mitigation Act of 2000, P.L. No. 106-390, 114 Stat. 1552-59, amended Section 406(e), but the change will become effect only if FEMA adopts implementing regulations, which has not yet occurred even 14 years later).

146. *Id.* at § 404; 42 U.S.C. § 5170c.

147. *Id.*

148. For example, an undersized culvert may cause flood damage to nearby homes and infrastructure when water backs up behind it - but the culvert itself is not damaged by the flood. The installation of a larger culvert would not qualify for Section 406 mitigation funding - but could be eligible for funding under Section 404. *See, e.g., Id.* at § 404; 42 U.S.C. § 5170c; 44 C.F.R. § 206.434 (2013). *See also* FEMA 322, PUBLIC ASSISTANCE GUIDE 124-125 (June 2007); FEMA 345, HAZARD MITIGATION GRANT PROGRAM DESK REFERENCE (Oct. 1999); FEMA 321, PUBLIC ASSISTANCE POLICY DIGEST 65 (Jan. 2008).

Funding for mitigation under Section 404 is appropriated by Congress virtually automatically based on a percentage of the cost of the “estimated aggregate amount of grants to be made (less any associated administrative costs)” with respect to a disaster¹⁴⁹ The percentage amounts available in states with an approved enhanced mitigation plan is 20 percent;¹⁵⁰ in other states the percentage varies: 15 percent (for amounts under \$2 billion), 10 percent (for amounts between \$2 and \$10 billion), 7.5 percent (for amounts between \$10 and \$35.333 billion).¹⁵¹ Because the amount of funding available is capped, the amount is computed by applying the appropriate percentages to the “estimated aggregate amount of grants” made available with respect to a disaster, Section 404 grants are generally administered by state grantees as a competitive grant program.¹⁵²

Section 203 of the Stafford Act also authorizes funding of “Pre-disaster mitigation.”¹⁵³ Its objectives are similar to the objectives of the HMGP, but funding of this program has been quite limited since its inception. The Obama administration has proposed eliminating funding of this program in its budget for several years,¹⁵⁴ although Congress has so far appropriated some modest funding of \$25 million.¹⁵⁵

A challenge in administering all of the Stafford Act’s mitigation programs has been identification of the funds that can supply the “non-federal share” required in a program that can fund “up to” (and

149. Stafford Act, § 404; 42 U.S.C. § 5170c(a).

150. FEMA, HAZARD MITIGATION ASSISTANCE UNIFIED GUIDANCE: HAZARD MITIGATION GRANT PROGRAM, PRE-DISASTER MITIGATION PROGRAM, AND FLOOD MITIGATION ASSISTANCE PROGRAM 3 (July 12, 2013), *available at* http://www.fema.gov/media-library-data/15463cb34a2267a900bde4774c3f42e4/FINAL_Guidance_081213_508.pdf.

151. Stafford Act, § 404a; 42 U.S.C. § 5170c(a).

152. FEMA, HAZARD MITIGATION ASSISTANCE UNIFIED GUIDANCE, *supra note* 150, at 59.

153. 42 U.S.C. § 5133 (2012).

154. OFFICE OF MGMT. & BUDGET, BUDGET OF THE U.S. GOVERNMENT, FISCAL YEAR 2013: CUTS, CONSOLIDATIONS, AND SAVINGS 74 (2012), *available at* <http://www.whitehouse.gov/sites/default/files/omb/budget/fy2013/assets/ccs.pdf>.

155. CONSOLIDATED AND FURTHER CONTINUING APPROPRIATIONS ACT, 2013, P.L. 113-46 (2013). Division D, heading National Pre-disaster Mitigation Fund: “For the pre-disaster mitigation grant program under section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. § 5133), \$25,000,000, to remain available until expended.

so not more than) 75 percent of the cost of any project.¹⁵⁶ A very common source of funds for the “non-federal share” needed for mitigation projects is provided from Community Development Block Grants, (“CDBG”) from the Department of Housing and Urban Development.¹⁵⁷ The popularity of CDBG funding is largely due to a quirk in the structure of the CDBG program. Virtually all other sources of federal funds retain their “federal” character when awarded, and so cannot satisfy a requirement that 25 percent of an HMGP project comes from a “non-federal” source. However, CDBG grants lose their “federal” character when awarded, and so applicants receiving CDBG funds can use those funds to fulfill non-federal cost share requirements.¹⁵⁸ It is the flexibility in utilization of this program that has made appropriations to CDBG such a critical part of federal disaster assistance and mitigation grant projects.

All of these requirements, incentives, and restrictions that sought to encourage mitigation planning and mitigation of properties from risk have been in effect for a number of years. FEMA’s procedures for implementing some of these restrictions may not be foolproof. But in any event, as noted at the outset of this article, the number of disaster declarations and the dollar value lost in disasters has been rising dramatically. These efforts have not been enough.

V. FLOOD INSURANCE REFORM LEGISLATION: TWO STEPS FORWARD, ONE STEP BACK

A. *Biggert-Waters Flood Insurance Reform Act of 2012*

The Biggert-Waters Flood Insurance Reform Act of 2012 became law when House and Senate managers attached a compromise version of House and Senate flood insurance reform legislation to a highway transportation authorization bill that had major legislative support, the “Moving Ahead for Progress in the 21st Century Act,” or

156. 42 U.S.C. § 5170c(a).

157. One example showing the interaction between CDBG grants and disaster assistance programs is found in the Second Allocation, Waivers, and Alternative Requirements for Grantees Receiving Community Development Block Grant (CDBG) Disaster Recovery Funds in Response to Disasters Occurring in 2013, 79 Fed. Reg. 31964 (June 3, 2014).

158. CDBG is a federal grant, that when used for its intended purposes, and provided that it is authorized to do so, may be used as a source of local match. The total funds must not exceed the total eligible project costs. *See id.*

“MAP-21.”¹⁵⁹ Subtitle II of MAP 21 was the Biggert-Waters Act, and its 53 pages covered the full range of issues that had proven controversial in the multi-year reauthorization process. The Act sought to create a factual and analytical basis for future reforms by requiring FEMA to study or make recommendations on how to address:

- Repayment of outstanding debt of the NFIP [By requiring FEMA to transmit a plan to Congress].¹⁶⁰
- The availability and affordability of insurance for natural catastrophe perils generally.¹⁶¹
- Mapping of future conditions of higher flood risk due to upstream development and sea level rise [by creating a task force to provide recommendations].¹⁶²
- Mapping of residual risk behind certified levees [Report].¹⁶³
- Expansion of coverage for business interruption and living expenses. [Study].¹⁶⁴
- Mapping and flood insurance credit for communities whose levees cannot be certified as providing adequate protection - but are working on fixing them¹⁶⁵ - and a “task force” to study how structures should be accredited.¹⁶⁶
- Creation of a scientific advisory panel to review disputes over mapping issues, local data in flood maps.¹⁶⁷ Require a

159. See BW-12, *supra* note 16.

160. *Id.* at § 100213.

161. *Id.* at § 100247.

162. *Id.* at § 100215(d). NFIP’s Community Rating System already credits communities which take into account future conditions in their flood plain management regulations’ implementing provisions: such as providing information about areas predicted to be susceptible to future flooding due to climate change or sea level rise, basing the community’s regulatory map on future-conditions hydrology, using regulatory flood elevations in the V and Coastal A Zones that reflect future conditions including sea level rise, and informing prospective buyers of the potential for future flooding. CRS Coordinators Manual, *supra* note 62, at 450-14.

163. BW-12, § 100231(e).

164. *Id.* at § 100233.

165. *Id.* at § 100230.

166. *Id.* at § 100226.

167. *Id.* at § 100218.

study of how interagency coordination of flood mapping can be improved.¹⁶⁸

- Expense reimbursements paid to insurance companies for selling and adjusting flood insurance policies [Study].¹⁶⁹
- Participation in and affordability of flood insurance [Study and Report].¹⁷⁰

However, what turned out to be the most significant, or at least controversial, changes enacted by BW-12 were a few short sections at the beginning of the bill. These sections were apparently added at the last minute of the legislative process to obtain the votes of lawmakers concerned that the systemic subsidies in the NFIP created a financial burden on taxpayers. These sections aggressively ratcheted up premiums for many classifications of flood insurance policies at rates of increase that Congress had previously staunchly prohibited.

First, the Biggert-Waters Act accepted the argument that while it may be appropriate to gradually remove subsidies on premiums for the *current* owners of property, there was no need to transfer these subsidies along to *future* purchasers of the property. The rationale for immediately removing subsidies for new owners was that new owners would have information about the flood risk of the property and what the premiums for insurance of that risk could be, and could decide whether to purchase the property based on the cost of flood risk. Section 100205(a)(1)(B) added a new subsection of the NFIA titled “No Extension of Subsidy to New Policies or Lapsed Policies,” and provided that:

The Administrator shall not provide flood insurance to prospective insureds at rates less than [actuarial rates]... for

- (1) any property not insured by the flood insurance program as of [July 6, 2012];
- (2) any property purchased after [July 6, 2012];
- (3) any policy under the flood insurance program that has lapsed in coverage, as a result of a deliberate choice of the holder of such policy; or

168. *Id.* at § 100221.

169. *Id.* at § 100224.

170. *Id.* at § 100236.

(4) any prospective insured who refuses to accept any offer for mitigation assistance by the Administrator (including an offer to relocate), including an offer of mitigation assistance [under the Stafford Act mitigation programs described earlier in this article] or in connection with (i) a repetitive loss property,¹⁷¹ or (ii) a severe repetitive loss property.¹⁷²

Under this section, the transition from subsidized to actuarial rates would take effect immediately upon sale of the property. It meant that, for high-risk properties, the seller of property may have paid a flood insurance premium of \$700 or \$800 per year – and, at closing, the buyer would discover that flood insurance premiums had increased to \$7,000 or \$10,000 or even more per year. Coupled with a federal law *requiring* mortgage lenders to assure that borrowers obtain and maintain flood insurance, and to purchase flood insurance for borrowers if the borrowers do not do so, this meant that many borrowers discovered that they could not afford to purchase the property at closing. The true impact of this section became known when FEMA published its Flood Insurance Manual, with revised premium tables and instructions to insurance companies selling the Standard Flood Insurance Policy, on October 1, 2012.¹⁷³

Second, Congress specified that flood insurance subsidies would be more gradually eliminated for a relatively long list of categories of properties. Thus, Section 100205(a)(1)(A) amended the Flood Insurance Act so that premiums were to rise by 25 percent per year for the following group of properties:

- Any residential property that is not a primary residence.
- Any severe repetitive loss property (even without an offer of mitigation funding).
- Any property with cumulatively more flood losses than the value of the property.
- Any business property.

171. A “Repetitive Loss Structure” is defined in the Standard Flood Insurance Policy, 44 C.F.R. § 61 App. A(1) at III(D)(3)(a) (2014).

172. BW-12, § 100205(a)(1)(B). Definition of “Severe Repetitive Loss Property” was the same as preexisting definition at 42 U.S.C. § 4102(a)(b) (2006) (repealed 2012).

173. FEMA, NFIP FLOOD INSURANCE MANUAL (October 2012), *available at* <http://www.fema.gov/media-library/assets/documents/28812?id=6393>.

- Any property which has incurred substantial damage of 50 percent or more.
- Any property with an improvement greater than 30 percent of the value of the property.¹⁷⁴

By contrast, under the NFIP prior to BW-12, FEMA was *permitted* to, but was not *required* to, increase premiums for any subsidized properties, but was *prohibited* from increasing premiums on any class of properties by more than 10 percent per year.¹⁷⁵

Finally, a very controversial provision in the Biggert-Waters Act was intended to eliminate the grandfathered rating of structures which had complied with flood plain management regulations at the time of construction, but which were no longer compliant due to map changes/updated flood risk information.¹⁷⁶ Section 100207, innocuously titled “Premium Adjustment,” provided that:

[A]ny 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.¹⁷⁷

This provision included a transition provision. Rather than immediately increasing premiums to the actuarial level appropriate given the building’s elevation and physical characteristics, the increase to reflect the higher flood risk was to be phased in:

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.¹⁷⁸

174. BW-12 § 100204(a)(1)(A).

175. 42 U.S.C. § 4015(e) (2012).

176. BW-12, § 100207.

177. *Id.*

178. *Id.*

Nonetheless, the annual increase in premiums could be very substantial. If a home was not mapped in a flood zone, its premiums could be quite low. Once mapped in a flood zone, the actuarial premium for the property, which would not likely be elevated or include the flood vents that reduce flood risk, could increase by an order of magnitude (e.g., from \$700 to \$7,000). To reach a \$7,000 annual premium in five years, the annual percentage premium increase would be almost 60% per year.¹⁷⁹ Increases of similar scale were possible if the flood zone was revised from an “A” zone, which assumes no significant risk of wave action, to a coastal “V” zone based on new risk of flooding, or if the base flood elevation shown for a zone increased by 5 or more feet.¹⁸⁰ The elimination of grandfathering generated a storm of protest even before FEMA took any steps to implement it.

In addition to the gradual elimination of subsidies and grandfather rating, BW-12 enacted a number of other provisions designed to increase revenues. It revised the way that FEMA computes actuarial rates. FEMA’s actuaries previously advised that it had computed actuarial rates based on “average historical loss year,” not including catastrophic loss years such as occurred in 2005.¹⁸¹ Section 100211, “Considerations in Determining Chargeable Premium Rates,” added a new “Rule of Construction” in calculating the “average historical loss year” requiring FEMA to use generally accepted actuarial principles when deriving actuarial premium rates and to include catastrophic loss years in its computations.¹⁸² Another BW-12 provision increases deductibles for flood insurance properties from

179. Computation: $\$70 \cdot (1+x)^5 = \$7,000$, where x is the annual percentage increase in premium divided by 100..

180. For example, in a VE zone, the flood insurance premium rate on a structure 1 foot above BFE is \$.90/\$100. If base flood elevation increases by 5 feet - as occurred prior to Hurricane Sandy in some parts of Long Island - the flood insurance premium rate would rise to \$3.58/\$100. FEMA, NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE MANUAL Rate - Table 9 (June 2014), available at http://www.fema.gov/media-library-data/1398107126260-26c03dc2b6f29b6c079dea2987f89c89/05_rating_508_june2014_b.pdf.

181. NATIONAL RESEARCH COUNCIL OF THE NATIONAL RESEARCH COUNCIL, LEVEES AND THE NATIONAL FLOOD INSURANCE PROGRAM IMPROVING POLICIES AND PRACTICES 72 (2013), available at http://www.nap.edu/openbook.php?record_id=18309&page=72.

182. BW-12, § 100211 (adding a new subparagraph (i) to 42 U.S.C. § 4015 (2012)).

\$500¹⁸³ to \$1,000¹⁸⁴ to \$2,000 for ‘pre-FIRM’ structures that are eligible for subsidies.¹⁸⁵ BW-12 also placed increased penalties on mortgage lenders who failed to require borrowers to purchase flood insurance, from \$350 per violation to \$2,000 per violation.¹⁸⁶

In sum, the Biggert-Waters Act went almost ‘all in’ in its effort to assure that property owners had the proper financial incentives to mitigate the risk of flooding. When property owners pay for flood insurance at actuarial rates, then the value of property in high-risk areas will decline. Homebuyers will choose to purchase homes in less risky areas, such as coastal zones. Developers will choose to avoid flood-prone areas because the prices for sale of new homes, burdened by high flood insurance rates, make it extremely difficult to make a profit. Property and business owners in high-risk areas would have an exceptionally strong incentive to invest in elevation or other mitigation measures that will reduce vulnerability to flood damage and hence reduce flood insurance premiums.

However, news of BW-12’s impact on individual homeowners and the real estate industry began to spread in the months following enactment of BW-12. Flood insurance premiums did not rise immediately upon enactment. FEMA makes changes to premiums semi-annually through publication of its Flood Insurance Manual on May 1 and October 1 of each year, so the significance of BW-12’s premium increases did not begin to hit home until October 1, 2012. Superstorm Sandy struck the Northeast at the end of October 2012 - triggering the gradual elimination of subsidies for hundreds of thousands of ‘substantially damaged’ properties, and demonstrating that many existing flood maps in the region significantly understated flood risk. The realization that grandfather status would not continue

183. \$500 for Pre-Firm properties located in flood zone B, C, X, A99, D in 2005. FEMA, NFIP FLOOD INSURANCE MANUAL Rate 12 (May 2005), *available at* <http://www.fema.gov/flood-insurance-manual/flood-insurance-manual-effective-may-1-2005>.

184. \$1,000 for Pre-Firm located in properties located in flood zone B, C, X, A99, D in 2012. FEMA, NFIP FLOOD INSURANCE MANUAL Rate 12 (October 2012), *available at* http://www.fema.gov/media-library-data/20130726-1851-25045-8388/_05_rating_oct2012.pdf.

185. \$2,000 FEMA, NFIP FLOOD INSURANCE MANUAL Rate 14 (June 2014), *available at* http://www.fema.gov/media-library-data/1398107126260-26c03dc2b6f29b6c079dea2987f89c89/05_rating_508_june2014_b.pdf. BW-12, § 100210, amending 42 U.S.C. § 4019 (2012).

186. BW-12, § 100208.

for structures built in compliance with the old flood maps caused a stir even though FEMA had never gotten around to implementing this provision.¹⁸⁷ It became apparent that a flood insurance program, intended to protect homeowners from losing their homes in the event of future flood damage, would cause the virtually immediate loss of homes due to foreclosure. Congresswoman Maxine Waters began a quick retreat from her previous association with the Biggert-Waters flood insurance reforms and announced that the Act had never been intended to cause such substantial increases in premiums.¹⁸⁸ Most other members of Congress joined in the scramble to back away from BW-12. The rollback of BW-12 was signed into law on March 21, 2014.¹⁸⁹

B. The Homeowner Flood Insurance Affordability Act of 2014

The new “Homeowner Flood Insurance Affordability Act of 2014” (“HFIAA-2014”)¹⁹⁰ was about a third the length of the Biggert-Waters Act, and its primary focus was to roll back many, but not all, of the flood insurance premium increases mandated by Biggert-Waters. Indeed, given the full-fledged Congressional retreat from Biggert-Waters, it is perhaps surprising how many of BW-12’s premium increases survived.

187. FEMA issued a memorandum on August 2, 2013 to clarify the implementation timeline of provisions of BW-12 and stated that FEMA would not implement the grandfather provisions “until at least late 2014.” Jhun de la Cruz, FEMA, W-13043, OCTOBER 1, 2013 PROGRAM CHANGES IMPACT ON NFIP GRANDFATHER PROCEDURES (AUG. 2, 2013) (mem.), available at <http://nfipiservice.com/Stakeholder/pdf/bulletin/w-13043.pdf>.

188. Rep. Waters, *Author of Flood Reform Act, Calls for Delay in Implementation*, INS. J. (Sept. 30, 2013), <http://www.insurancejournal.com/news/national/2013/09/30/306602.htm>.

189. The vote for passage was bipartisan. The Senate voted 72-22 for passage; the “yea” voters included Senator Cruz of Texas, who had been one of the most strident Senators seeking to pressure fiscal reforms by opposing funding of the federal government in the fall of 2012. U.S. Senate, *U.S. Senate Roll Call Votes 113th Congress- 2nd Session*, senate.gov (Mar. 13, 2014), http://www.senate.gov/legislative/LIS/roll_call_lists/roll_call_vote_cfm.cfm?&congress=113&session=2&vote=00078. The vote for passage in the House was 306-91, with Republicans voting 126-86 and Democrats voting 180-5. *Final Vote Results for Roll Call 91*, Clerk.house.gov (Mar. 4, 2014), <http://clerk.house.gov/evs/2014/roll091.xml>.

190. HFIAA, *supra* note 17.

The first substantive provision of HFIA-2014 was for “Repeal of Certain Rate Increases.”¹⁹¹ This section amended the new Section 1307(g) of the National Flood Insurance Act- added by BW-12- “by striking paragraphs (1) and (2),” effective as of July 6, 2012.¹⁹² By doing so, the immediate increase to actuarial rates for these properties was repealed. FEMA was also directed to arrange for the refund of the increased premium dollars that had been paid as a result of BW-12’s rate increase.¹⁹³ The increase to actuarial rates for properties where insurance lapsed “as a result of the deliberate choice” of the policyholder was retained, but Congress carved out an exception for policyholders who allowed their policy to lapse “as a result of the property covered by the policy no longer being required to retain such coverage.”¹⁹⁴

The second substantive provision of HFIAA-2014, “Restoration of Grandfathered Rates,” simply repealed BW-12’s removal (over a five-year period) of grandfathering of properties as a result of changes in flood insurance maps.¹⁹⁵ The restoration was effective as of July 6, 2014, and no refund provisions were provided since the provision had never been implemented.

None of the other rate increases adopted by BW-12 were repealed. Instead, HFIAA-2014 slowed down their implementation. Thus, for the categories of properties that were singled out for 25 percent premium increases until actuarial rates were achieved,¹⁹⁶ HFIAA-

191. *Id.* at § 3(a)(1)(A).

192. *Id.*

193. *Id.* at § 3(a)(3)-(4).

194. *Id.* at § 3(a)(1)(B). For example, a property may have been located in a flood zone, and its owner have acquired flood insurance in compliance with the mandatory flood insurance purchase requirement. If a new floor map places a property outside of the flood zone flood insurance is no longer required and the owner may have cancelled coverage. In this situation, cancellation does not trigger loss of subsidized rates.

195. *Id.* at § 4.

196. Any residential property that is not a primary residence; any severe repetitive loss property (even without an offer of mitigation funding); any property with cumulatively more flood losses than the value of the property; any business property; any property which has incurred substantial damage of 50 percent or more. BW-12, *supra* note 16, at § 100204(a)(1)(A). HFIAA-2104 did eliminate BW-12’s reduction in the size of an improvement that would trigger actuarial rates; the triggering percentage was restored to 50 percent of the market value of the property. HFIAA, § 15 (a section intriguingly titled “Home Improvement Fairness”).

2014 retained the 25 percent per year increases.¹⁹⁷ Second homes, business properties, and repetitive loss properties can expect 25 percent premium increases for some time. The rate of allowable premium increases for other properties, which was 20 percent per year under BW-12, was reduced to 18 percent.¹⁹⁸

The premium revenue lost by the repeal of ‘certain rate increases’ and of ‘grandfathered rates’ was to be somewhat offset by enacting a surcharge on all flood insurance policies of either \$25 or, if the property is a business property or a residence that is not a primary residence, \$250.¹⁹⁹

HFIAA-2014 also enacted a number of additional provisions in an effort to balance the premium protection being provided to property owners in subsidized areas against the objective of achieving financial sustainability and providing incentives to property owners to mitigate risk.

FEMA was required to offer optional high-deductible policies for homeowners.²⁰⁰ FEMA was required to allow homeowners to pay insurance premiums monthly rather than annually.²⁰¹ Flood insurance would not be required on detached structures, such as garages, that may be part of a property but detached from the primary residential structure.²⁰² FEMA was required to incorporate some flood mitigation investments in homes- perhaps including flood-proofing- in its determination of flood insurance premiums.²⁰³

VI. LIVING WITH HIGHER RATES

The roller coaster ride of flood insurance reform over the last two years has taught several lessons.

First, the true actuarial rates of properties that are not elevated above base flood elevation and that do not have proper flood vents and breakaway walls in lower enclosures can be very high. For many Americans, purchase of a home is the biggest investment of their lives, and the monthly mortgage payment (with taxes and insurance)

197. *Id.* at § 5; *See also* BW-12, at §100205 (c)(3).

198. HFIAA, § 5.

199. *Id.* at § 8.

200. *Id.* at § 12.

201. *Id.* at § 11.

202. *Id.* at § 13.

203. *Id.* at § 14, § 26.

is at the upper end of what they can afford. BW-12 demonstrated the consequences of an immediate jump to actuarial rates. Adding \$1,000 per month (\$12,000 per year) to a mortgage payment would push many existing homeowners into foreclosure and force buyers to walk away from contracts once the flood insurance rates were disclosed at closing. The impact of a rapid jump in insurance premiums on property owners is even more powerful because, for most owners of property in mapped flood zones, flood insurance is not voluntary; virtually every such property owner with a mortgage is required by federal law to obtain and maintain flood insurance. The ironic result of the BW-12 increases was that a program designed to protect homeowners from losing their homes due to the *possibility* of future flooding instead threatened homeowners with the *probability* of losing their homes due to foreclosure well before any floodwaters arrived. These immediate premium increases have been repealed.

Second, most property owners in subsidized properties can expect to see flood insurance premium increases that, over the life of their mortgages, will rise toward actuarial levels. At the 25 percent per year rates specified in BW-12 for business properties and second homes and repetitive loss properties, it only takes 11 years for a \$1,000 per year premium to reach \$11,000 per year.²⁰⁴ These increases will have only begun to bite- getting to two or three times the starting premium level- by the time Congress must reauthorize the program again in 2017.²⁰⁵ Increases for subsidized properties that do not fall within the “25 percent per year” group will take longer to get to the pain level. If future property buyers believe that these increases will not be repealed, we can expect to see a significant decrease in the market value of subsidized properties.

Third, the need to eliminate the growing and predicted subsidization of flood insurance when flood risk increases faces enormous challenges. HFIAA-2014 restored grandfathering of premium rates when flood maps change to reflect increased flood risk. So premium rates will not ‘internalize’ the real cost of flooding if the sea level rise now being predicted takes place. Property owners will pay the actuarial rates that were in effect when a structure was built, and will remain eligible for those rates until ‘new construction’

204. Formula for computation: 1.25^t , where t is the number of years from the start of premium increases.

205. BW-12, § 100203. The NFIP is reauthorized until September 30, 2017.

or ‘substantial improvement’ wipes the slate clean. Given the scale of projected increases in Standard Flood Hazard Areas and sea level rise, the NFIP will continue to have financial trouble.

Hidden among the long list of studies and reports mandated by BW-12 and HFIAA-2014 are several that should inform the debate over flood risk and flood insurance that must occur when the NFIP’s authorization expires in 2017. We will know more about the affordability of flood insurance, about residual risk behind levees, and, of particular importance to the issue of climate change, whether FEMA can or should use revised flood maps to show the flood risk that may be generated by “future conditions” caused by projected upstream development and climate change. And we will know more about how the flood insurance rate increases already underway have impacted communities and property owners.

Americans’ love of living by the water will continue to bring people and homes and infrastructure into areas of potential flood risk. The cost of this flood risk will become prohibitive without continuous efforts to provide information about flood risk and how it is changing and to provide information and incentives so that development in flood-prone areas is reasonably safe from flooding.