



# INACTION ON CLIMATE CHANGE: The Cost to Taxpayers

A Ceres Report  
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Authored By  
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## ABOUT CERES

**Ceres** mobilizes a powerful coalition of investors, companies and public interest groups to accelerate and expand the adoption of sustainable business practices and solutions to build a healthy global economy. Ceres also directs the Investor Network on Climate Risk (INCR), a network of 100 institutional investors with collective assets totaling more than \$10 trillion.

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## FOREWORD

By  
**Mindy Lubber**  
*President of Ceres*



In my foreword to our *2012 Insurer Climate Risk Disclosure Survey* I asked a fundamental question: is the insurance industry prepared for climate change?

On the first anniversary of Hurricane Sandy, I ask a similar question of our public sector: are the public programs that pay for disaster relief and recovery taking account of climate change?

And to the taxpayers of this country, I ask yet another fundamental question: do you know how much inaction on climate change is costing you?

Last year's extreme weather losses alone, led by Hurricane Sandy and a devastating drought that affected over 70 percent of the country, cost every person in America more than \$300—or more than \$100 billion altogether. Yet, our public disaster relief and recovery programs have been slow to recognize that 'business as usual' will drive the cost of these programs to unsustainable levels. The National Flood Insurance Program is \$24 billion in debt, the Federal Crop Insurance Program paid record claims of over \$17 billion in 2012, wildfire costs have tripled since the 1990s, the loss exposure of state-run insurance plans has skyrocketed, and federal disaster assistance for natural disasters costs us \$20 billion even in a quiet year, that is, in a year without a major weather catastrophe.

And, instead of encouraging behavior that prevents and reduces risks from extreme weather events, the very programs that are meant to provide aid when disaster strikes instead encourage behavior that increases those risks—such as new development in hurricane or wildfire prone areas and agricultural practices that increase vulnerability to drought.

A sustainable future is possible, but as I said in my foreword to Ceres' *2012 Annual Report*, the future must be now. This new report, *Inaction on Climate Change: The Cost to Taxpayers*, provides key recommendations for policymakers and others to make our public disaster and relief programs more economical and effective today and sustainable over the long term in our warming world.

# Executive Summary



*"There are risks and costs to a program of action. But they are far less than the long-range risks and costs of comfortable inaction."<sup>1</sup>*

— President John F. Kennedy

When we examine the full costs of public programs that pay for disaster relief and recovery from extreme weather events—ad hoc disaster assistance appropriations, flood insurance, crop insurance, wildfire protection, and state run “residual market” insurance plans—we can begin to understand the price to U.S. taxpayers of inaction on climate change. Each of these programs is highly exposed to catastrophic weather events. As climate change results in more frequent, volatile and damaging extreme weather across the country, the potential liabilities of these public programs and the bottom line costs to taxpayers will soar. Taxpayers bear an additional burden—damages from extreme weather events that are neither insured by the private insurance market nor reimbursed by government programs. Continuing to ignore these escalating risks may be more comfortable than confronting the challenges of climate change, but inaction is the far riskier and more expensive path.

***As climate change results in more frequent, volatile and damaging extreme weather across the country, the potential liabilities of these public programs and the bottom line costs to taxpayers will soar.***

The dispersion of disaster relief and recovery funding across various federal and state programs, along with the lack of transparency about their economics, make it difficult to calculate the total costs to taxpayers of extreme weather events. In years with a small number of natural catastrophes, typically taxpayers assume annual estimated costs as follows:

- ➔ \$20 billion related to federal expenditures on disaster assistance
- ➔ \$9 billion reflecting the taxpayer share of premiums paid to the Federal Crop Insurance Program
- ➔ \$5 billion in annual federal and state expenditures on wildfire protection<sup>2</sup>

In a year with numerous major weather-related catastrophes, the cost can be more than triple that amount: in 2012 extreme weather events in the U.S. caused about \$110 billion in economic losses to the economy, or more than \$300 for every American. Additionally, federal taxpayers are supporting the National Flood Insurance Program, which is at least \$24 billion in debt, and state taxpayers are sharing in the costs of supporting state-run insurance plans.

As the frequency and severity of extreme weather events intensify with the effects of climate change, our federal and state disaster relief and insurance programs will become increasingly unsustainable as losses from such events increase. The net present value of the federal government's liability for unfunded disaster assistance over the next 75 years could be greater than the net present value of the unfunded liability for the Social Security program.

As the population and wealth of the U.S. become increasingly concentrated along the coasts and in urban areas, more people, businesses and properties will be exposed to extreme weather events. Catastrophe modeler AIR Worldwide estimates that the value of insured properties along the Gulf and Atlantic coasts, currently about \$10 trillion, could double every 10 years. Increasing coastal population density and property values, combined with sea level rise, are dramatically increasing the loss exposure of the already indebted National Flood Insurance Program. Those same developments caused the loss exposure of the majority of state-run insurance plans for high risk properties to increase by about 1,550 percent from 1990 to 2010, from about \$40 billion in 1990 to over \$660 billion in 2010. A minority of those plans saw a smaller increase in their loss exposure over that period of about 550 percent.

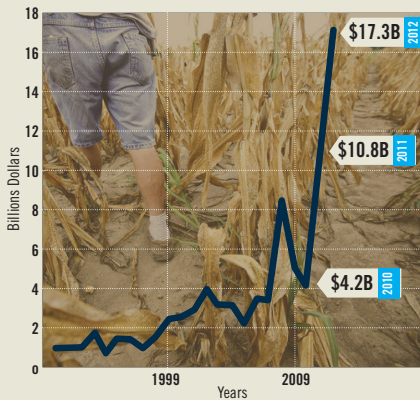
Likewise, more severe and widespread droughts, such as the drought of 2012, which caused record claims payments under the Federal Crop Insurance Program totaling over \$17 billion, are increasing the loss exposure of that program. And, federal and state wildfire protection costs have tripled

<sup>1</sup> <http://www.jfku.edu/About-Us/The-JFK-University-Story.html>

<sup>2</sup> All sources for the information in the Executive Summary are footnoted in the body of this report

## Extreme Weather = Extreme Crop Losses

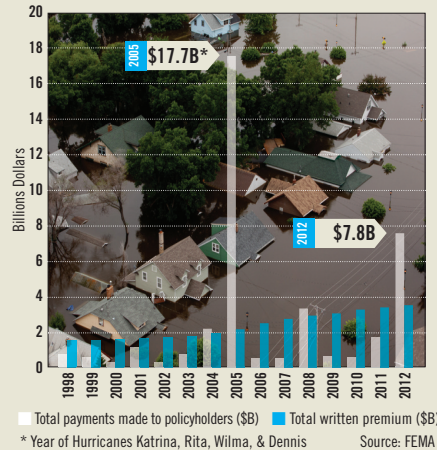
Federal Crop Insurance Payouts



Sources: U.S. Department of Agriculture Risk Management Agency; Natural Resources Defense Council

## Rising Tides Raise Flood Losses

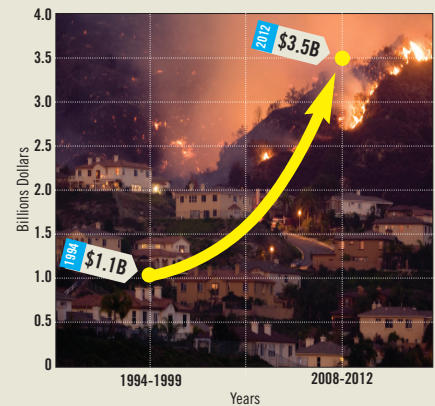
National Flood Insurance Program Payouts



Source: FEMA

## Wildfires Are Burning a Hole in Our Pockets

Average Annual Federal Wildfire Appropriations



Source: CRS Reports for Congress, RL33990 and R43077

since the 1990s due to the longer and more severe wildfire seasons caused by a warming world, combined with increasing population density in areas that abut forests.

But direct damages are only part of the devastation of natural catastrophes; natural catastrophes also have long-term indirect costs. The long-term effects of extreme drought, for example, trigger restricted municipal and industrial water availability, limitations on the efficiency of hydropower generation and power plant production, disruption to and limits on navigation, increased fire risk, and price increases for certain consumer staples, such as food and apparel. Those indirect costs undermine our overall economy. For example, 25 percent of small businesses impacted by a natural disaster never reopen. As small businesses employ about half of the private sector workforce in the U.S., their demise from extreme weather events is a significant economic drain.

Actions to prevent and reduce damages from extreme weather events not only protect people and property, they are a sound investment: \$1 spent on prevention saves \$4 in damages, according to FEMA and to a widely-cited study by the Multihazard Mitigation Council of the National Institute of Building Sciences. Conversely, we exacerbate future losses by failing to adopt and enforce land use regulations that prohibit development in areas that are vulnerable to floods or wildfires; by failing to update and enforce building codes that mandate the use of weather-resistant construction practices and materials; and by failing to couple disaster assistance funding with obligations to take steps to protect against future extreme weather events.

Acknowledging extreme weather event costs and taking steps to minimize those costs has another benefit: it helps maintain the availability and affordability of private insurance. A strong insurance market can significantly finance the costs of reconstruction following a catastrophic event and enable individuals and businesses to rebound more quickly. Today, only about 50 percent of the damages in the U.S. caused by extreme weather events are privately insured. Developing innovative insurance models and products that increase the percentage of insured damages relative to uninsured damages would be an economic benefit to taxpayers, as well as a business opportunity for the private insurance sector.

Boosting our resiliency to today's extreme weather events is an urgent priority. Investing concurrently in forward-looking measures that over time will reduce the climate-altering carbon emissions contributing to extreme weather is essential to our long-term physical and economic well-being.

As Mark Twain famously has been quoted: "A great, great deal has been said about the weather, but very little has ever been done."<sup>3</sup> Continuing to ignore more pronounced extreme weather and what it portends about the risks and costs of inaction on climate change is a luxury we cannot afford.

Accordingly, the Ceres report author makes the following recommendations:

3 There is some debate as to whether Mark Twain or someone else said this.

## OUR GENERAL RECOMMENDATIONS FOR ALL PROGRAMS

- **Transparency:** Acknowledge and account for the costs of extreme weather events to federal disaster relief and recovery programs by identifying, in one easily accessible website, all federal programs that disburse funds for natural disaster relief and recovery, including annual and supplemental disaster assistance appropriations for natural catastrophes, the National Flood Insurance Program, the Federal Crop Insurance Program, and wildfire protection funding. Take similar action at the state level.
- **Research:** Undertake the necessary research to understand how climate change will impact such programs to inform the adoption of measures to make these programs more sustainable over the long-term
- **State and Local Action:** Adopt and enforce land use regulations that maintain natural barriers (such as dunes and wetlands) and that prohibit development in areas that are highly vulnerable to floods or wildfires; adopt and enforce building codes that mandate the use of weather resistant construction practices and materials
- **Increase Level of Private Insurance Market Participation:** Explore ways to increase private insurance market participation to complement public disaster relief and recovery programs and, in pricing insurance premiums, consider the use of forward-looking catastrophe risk modeling that takes appropriate account of climate change risks
- **Mitigation:** Adopt policies in both the public and private sectors to aggressively reduce greenhouse gas emissions in order to promote long-term sustainability

## OUR PROGRAM-SPECIFIC RECOMMENDATIONS

### Disaster Assistance:

- Budget for the reasonably foreseeable annual costs of natural disaster assistance provided under the Stafford Act and reduce reliance on ad hoc funding when disasters occur
- Require that states use a percentage of federal disaster assistance funds to make their public infrastructure more resistant to extreme weather events
- Condition FEMA approval and renewal of state hazard mitigation plans on the incorporation of climate change risks into planning scenarios

### National Flood Insurance Program:

- Implement the Biggert-Waters Act reforms, including phasing in insurance premium rates that better reflect risk and developing affordability solutions that do not include rate discounts
- Incorporate climate change risks into flood plain maps, loss models and insurance premium rate-setting, with due recognition of mitigating factors such as levees
- Condition FEMA approval and renewal of Flood Mitigation Assistance grants on incorporating climate change risks into planning scenarios

### Federal Crop Insurance Program:

- Reform the subsidies to make the program more cost-efficient
- Institute a pilot program that offers lower insurance premiums to farmers who adopt farming practices which increase resiliency to weather extremes, such as sustainable soil management practices, to reflect their reduced risk
- Incorporate climate change risks into insurance premium rate-setting

### Wildfire Protection:

- Allocate substantially more federal and state resources to wildfire prevention measures and consider climate change effects on wildfires in determining the appropriate level of resources
- Require that states use a percentage of federal financial assistance for wildfire suppression to improve wildfire protection
- Adopt and enforce state and local regulations that require wildfire risk reduction actions by property owners, such as set-back requirements

### State-Run Insurance Plans:

- Consider excluding coverage for new development in locations at high risk of damage from natural disasters, such as barrier islands
- Charge insurance premium rates that truly reflect risk
- Incorporate climate change risks into insurance premium rate-setting



# Introduction

**When we examine the full costs of public programs that pay for disaster relief and recovery from extreme weather events—ad hoc disaster assistance appropriations, flood insurance, crop insurance, wildfire protection, and state run “residual market” insurance programs—we can begin to understand the price to U.S. taxpayers of inaction on climate change. Each of these programs is highly exposed to catastrophic weather events. As climate change results in more frequent, volatile and damaging extreme weather**

across the country, the potential liabilities of these public programs and the bottom line costs to all of us will soar. We all bear an additional burden: we pick up the tab for damages from extreme weather events that are neither insured by the private insurance market nor reimbursed by government programs. Continuing to ignore these escalating risks may be more comfortable than confronting the many challenges of adapting to and slowing down climate change, but inaction is the far riskier and more expensive path.

**This report focuses on five disaster relief and recovery programs in which the costs of inaction on climate risk are most pronounced:**

- Federal disaster assistance appropriations (ad hoc)
- The National Flood Insurance Program (NFIP)
- The Federal Crop Insurance Program (FCIP)
- Wildfire protection (both federal and state)
- State-run insurance plans (known as residual insurance markets)

The dispersion of disaster relief and recovery funding across various federal and state programs, along with the lack of transparency about their economics, make it difficult to calculate the total costs to taxpayers of extreme weather events. In years with a small number of natural catastrophes, typically taxpayers assume annual estimated costs as follows:

- \$20 billion related to federal expenditures on disaster assistance
- \$9 billion reflecting the taxpayer share of premiums paid to the Federal Crop Insurance Program
- \$5 billion in annual federal and state expenditures on wildfire protection.<sup>4</sup>

In a year with numerous major weather-related catastrophes, the cost can be more than triple that amount. For example, in 2012 extreme weather events in the U.S. caused about \$110 billion in economic losses to the economy, or more than \$300 for every American.<sup>5</sup> By one estimate, the net present value of the federal government's liability for unfunded disaster assistance over the next 75 years could be greater than the net present value of the unfunded liability for the Social Security program.<sup>6</sup>

Private sector insurers also pay for losses caused by extreme weather events. Insured weather catastrophe losses in the U.S. from 1990 to 2011 totaled about \$385 billion, which averages out to about \$1.6 billion per month (and that does not include the insured losses from Sandy and other extreme weather events in 2012).<sup>7</sup>

On average, since 1980 private sector insurers have paid for about half of annual losses in the U.S. from catastrophic weather events, with public funding and private parties paying out-of-pocket picking up the other 50 percent.<sup>8</sup>

But direct damages are only part of the devastation of natural catastrophes; natural catastrophes also have long-term indirect costs. For example, the long-term effects may include foregone revenue, disruptions in supply chains and price increases for certain consumer staples. Those indirect costs undermine our overall economy.

4 Citations are in the Disaster Assistance Appropriations, FCIP and Wildfire Protection sections of this report

5 The White House, “President Obama’s Plan to Fight Climate Change,” June 25, 2013, p. 2; Daniel Lashof and Andy Stevenson, “Who Pays for Climate Change?” NRDC Issue Paper, May 2013 (\$96 billion dollar estimate). There were about 314 million Americans in 2012. United States Census Bureau, “USA, People QuickFacts”

6 J. David Cummins, Michael Suher and George Zanjani, “Federal Financial Exposure to Natural Catastrophe Risk,” chapter in “Measuring and Managing Federal Financial Risk,” National Bureau of Economic Research, edited by Deborah Lucas, February 2010

7 Frank Nutter, Reinsurance Association of America, “Build It Better Leadership Forum,” May 17, 2013, citing ISO’s Property Claim Services Unit. (The \$385 billion includes \$24.4 billion for terrorism and \$18.2 billion for geologic events.)

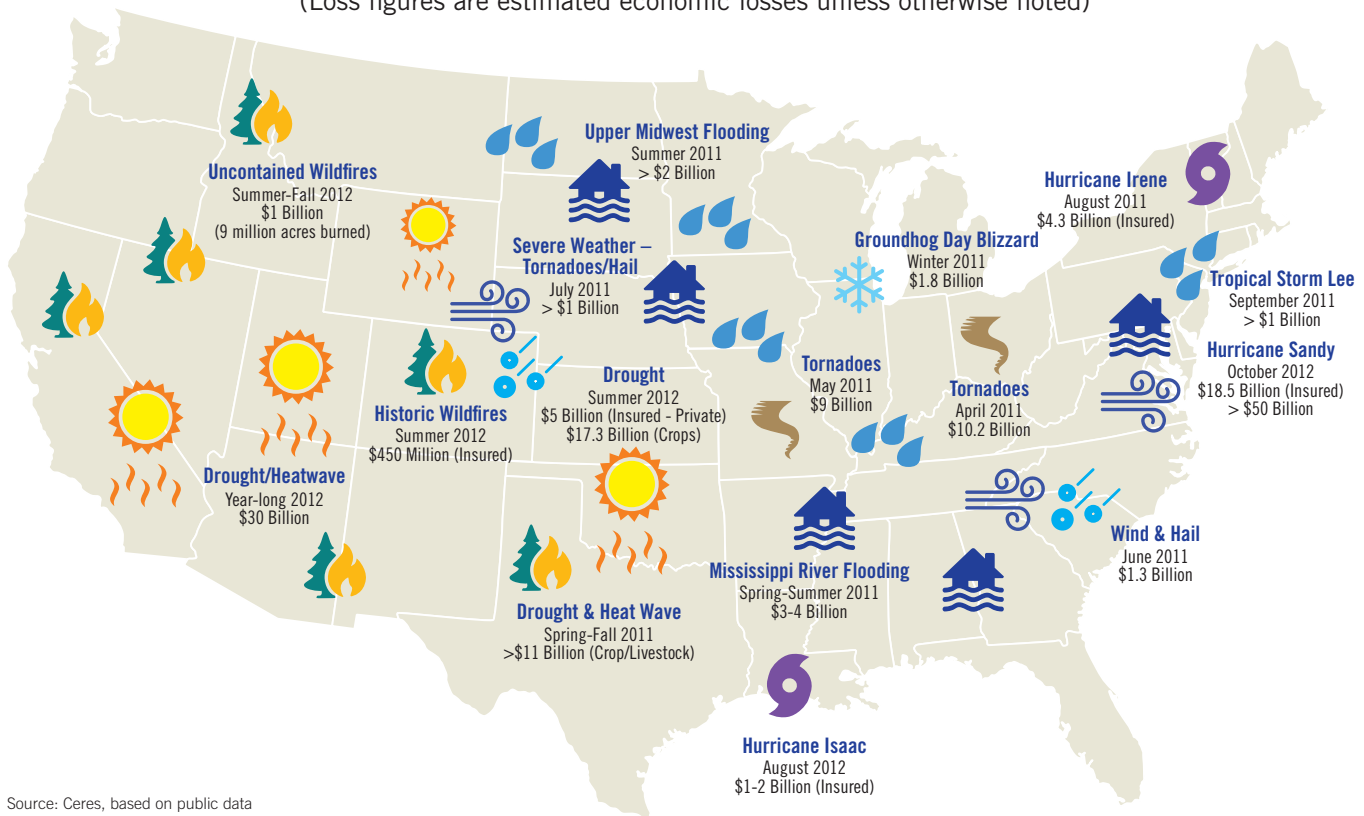
8 Munich Re, “2012 Natural Catastrophe Year in Review,” January 3, 2013, p. 8



# STORMY FUTURE

## Losses from U.S. Extreme Weather Disasters – 2011-2012

(Loss figures are estimated economic losses unless otherwise noted)



Source: Ceres, based on public data

### More extreme weather is the new normal for the U.S.

There have been at least 200 weather-related natural catastrophes annually in North America in recent years, compared to around 50 a year in the early 1980s.<sup>9</sup> As the frequency and severity of extreme weather events intensify with the effects of climate change, our federal and state disaster relief and insurance programs will become increasingly unsustainable.

Although certain areas of the country are more exposed to specific climate perils than others, no part of the country is immune to the economic damages and disruptions caused by extreme weather events, as the following 2012 events demonstrated:

- ➔ About 15 percent of the U.S. population was affected by Superstorm Sandy, which caused an estimated \$50 billion to \$65 billion in economic damages;<sup>10</sup>
- ➔ 80 percent of the land area of the contiguous United States and over 70 percent of the land area of the entire United States, including Alaska and Hawaii, was affected at one point by the year-long 2012 drought;<sup>11</sup>
- ➔ One-third of the U.S. population experienced 100° temperatures for 10 days or more;<sup>12</sup>
- ➔ Wildfires burned over 9 million acres across the West, about the size of Connecticut and Massachusetts combined;<sup>13</sup>
- ➔ There were 11 extreme weather events across the country that caused over \$1 billion in damages each and over \$110 billion in damages collectively.<sup>14</sup>

9 Munich Re, Severe weather in North America, 2012, p. 19. The growth curve is not in our favor: the upward trend in insured losses caused by extreme weather events since the 1980s is steeper in North America than in any other place in the world. Munich Re Press Release, "North America most affected by increase in weather-related natural catastrophes," October 17, 2012

10 Insurance Information Institute, "Catastrophes: Insurance Issues," August 2013; NOAA National Climatic Data Center (NCDC), "Billion-Dollar Weather/Climate Disasters"

11 Peter Folger, Betsy A. Cody, Nicole T. Carter, "Drought in the United States: Causes and Issues for Congress," Congressional Research Service RL34580, April 22, 2013, p. 3). The 2012 drought caused about \$30 billion in economic damages. NOAA NCDC, "Billion-Dollar Weather/Climate Disasters"

12 "President Obama's Plan to Fight Climate Change," June 25, 2013, p. 2. And, 19 states had their warmest year on record. NOAA NCDC, "National Overview—National 2012" The combined economic damages from the drought and heat waves totaled about \$78 billion, by one estimate. Daniel J. Weiss and Jackie Weidman, "Going to Extremes: The \$188 Billion Price Tag from Climate-Related Extreme Weather," Center for American Progress, February 12, 2013

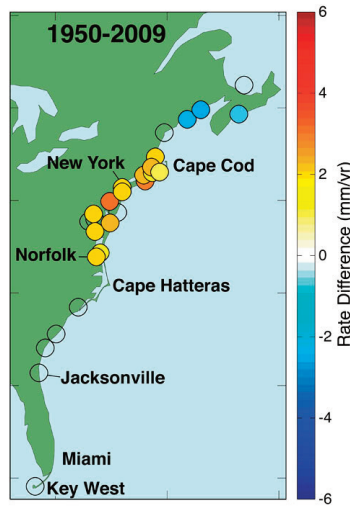
13 Insurance Information Institute, p. 3. Those wildfires caused about \$2 billion in economic damages. National Interagency Fire Center, "Total Wildland Fires and Acres"

14 NOAA NCDC, "Billion-Dollar Weather/Climate Disasters"

## ATLANTIC COAST IS HOT SPOT FOR SEA LEVEL RISE

Sea level along the Atlantic Coast from Massachusetts to North Carolina is rising 3 to 4 times faster than the global average.

Image from Sallenger, et al; Used in "Northeastern U.S. Coast Is 'Hot Spot' for Sea-Level Rise," Wynne Parry, LiveScience, June 25, 2012: "Increasingly red circles indicated locations where increases in sea level have been largest from 1950 to 2009. Researchers found a 'hotspot' of increased rates of sea-level rise from north of Boston, Mass., south to Cape Hatteras, N.C."



Perhaps the most well documented effect of climate change, and one that poses a significant risk to the U.S. coastline, is sea level rise. The Intergovernmental Panel on Climate Change (IPCC), which has documented global sea level rise from 1971 to 2010, recently concluded that there is a 99 percent to 100 percent probability that global mean sea level rise will continue for centuries.<sup>15</sup>

Furthermore, the Atlantic Coast from Massachusetts to North Carolina is a global hotspot for sea level rise, with the sea levels rising three to four times faster than the global average since about 1990.<sup>16</sup> That stretch of coastline includes New York City, which one study characterized as either the riskiest or second riskiest city in the world in terms of coastal property value at risk from flooding (about \$3 trillion).<sup>17</sup>

As the population and wealth of the U.S. become increasingly concentrated along the coasts and in urban areas, more people, businesses and properties will be at risk from extreme weather events. The population of coastal shoreline counties increased by 39 percent from 1970 to 2010 and is projected to increase by another 8 percent by 2020.<sup>18</sup> In 2010, the

population density of those counties was over six times that of corresponding inland counties, a trend that is projected to continue.<sup>19</sup> Catastrophe modeler AIR Worldwide estimates that the value of insured coastal properties in the U.S., currently about \$10 trillion, could double every 10 years.<sup>20</sup>

***We generally have favored apparent short-term cost savings over investments in disaster mitigation and resiliency.***

The reality is that \$1 spent on prevention saves \$4 in disaster costs.<sup>21</sup> The need for solutions that prevent and reduce damages from extreme weather events is great. One type of solution is the work of the Insurance Institute for Business & Home Safety (IBHS), which does scientific research on structural design and construction to make commercial and residential buildings more resistant to extreme weather.<sup>22</sup> The insurance industry and its regulators, working together, could seek additional ways to convert the billion-dollar taxpayer burden of climate change into a market opportunity by developing climate safety products that benefit policyholders and generate new sources of revenue for the insurance sector.

Part of the reason for our collective shortsightedness is that the issue of climate change, and what to do about it, has become politicized in the U.S. That politicization has obscured the scientific consensus that there is a 95 percent to 100 percent likelihood that human influence has been the dominant cause of global warming since the mid-20th century, resulting in changes in climate extremes and global mean sea level rise, among other effects.<sup>23</sup> Once our politicians acknowledge the role of human activities in causing global warming and the cost of inaction, we will be able to focus on finding public and private solutions to reduce greenhouse gas emissions so that we reduce our long-term risks and costs from climate change.

Acknowledging the costs of inaction on climate change and adapting our disaster relief and recovery programs to account for the costs of extreme weather events will make the programs more sustainable for the foreseeable future. Continuing to follow the far riskier and more expensive path of inaction will drive the cost of these taxpayer-supported programs to unmanageable and unsustainable levels.

15 IPCC WGI AR5, "Summary for Policymakers," September 27, 2013, p. SPM-20

16 Mark Fischetti, "Storm of the Century \*Every Two Years\*," Scientific American, June 2013, pp. 60 and 62; U.S. Geological Survey, "Sea Level Rise Accelerating in U.S. Atlantic Coast," USGS Newsroom, June 24, 2012

17 Fischetti, p. 62; AIR Worldwide, "The Coastline at Risk: 2013 Update to the Estimated Insured Value of U.S. Coastal Properties," 2013, p. 4. Swiss Re, "Mind the risk," September 2013, which ranks natural disaster risks to cities by different measures, ranks New York City as the third riskiest metropolitan area in the U.S.

18 NOAA's State of the Coast, "National Coastal Population Report, Population Trends from 1970 to 2020," March 2013. Coastal shoreline counties are those that abut the open ocean, major estuaries and the Great Lakes.

19 NOAA's State of the Coast

20 AIR Worldwide, p. 3

21 Multihazard Mitigation Council of the National Institute of Building Sciences, "Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities," Vol. 1, 2005, p. 5; FEMA Press Release Number 1662-023, "Mitigation Saves Time, Money And, Possibly, Lives," November 8, 2006

22 www.disastersafety.org

23 IPCC WGI AR5, p. SPM-12. Even before the IPCC's fifth assessment was released, 97 percent of climate scientists agreed that warming climate trends over the past 100 years are very likely due to human activities. National Aeronautics and Space Administration, "Global Climate Change," Consensus

# Disaster Assistance Appropriations

As the incidence of extreme weather events mount, so do the federal dollars allocated to states when a natural disaster is declared. However, it is difficult to calculate the total annual cost to taxpayers of federal disaster assistance appropriations for natural catastrophes because most of the funding is appropriated through ad hoc supplemental appropriations following natural disasters, when immediate rebuilding and recovery are the foremost concerns.<sup>24</sup> Supplemental appropriations dwarf the annual appropriations.<sup>25</sup> The Sandy supplemental appropriation, for example, was \$50.7 billion, not counting the additional \$9.7 billion in borrowing authority to the NFIP.<sup>26</sup> Budgeting for the reasonably foreseeable annual costs of natural disaster assistance would make the costs more transparent.

The disbursement of federal disaster assistance funds through numerous departments of the federal government further complicates evaluations of how much taxpayer money is spent on disaster assistance appropriations. By one estimate, the federal government, through 19 departments, paid \$136 billion in disaster assistance from fiscal year 2011 to fiscal year 2013, including disaster assistance for Sandy.<sup>27</sup> Other studies calculate that the federal government, through 35 separate supplemental appropriations, provided \$163 billion in disaster assistance from 2005 through 2010.<sup>28</sup> There is no centralized reporting of these expenditures of taxpayer dollars, nor is any coordination of federal spending on natural disaster assistance apparent.

Identifying, in one easily accessible website, all annual and supplemental disaster assistance appropriations for natural catastrophes, as well as all other federal programs that disburse funds for natural disaster relief and recovery (including the NFIP, the FCIP and wildfire protection funding), would help make such costs transparent and measurable. States could take similar action with respect to their own natural disaster relief and recovery programs.

Although it is difficult to determine total annual federal spending on natural disaster assistance, by one conservative estimate the average annual bill that taxpayers can expect to

## \$1 SPENT ON PREVENTION SAVES \$4 IN DAMAGES



Source: NOAA, Department of Commerce

pay for federal disaster assistance appropriations for hurricanes, thunderstorms, winter storms, and earthquakes is \$20 billion. (Notably, in any given year, one catastrophic event, alone, could cost over \$100 billion, causing that annual bill to skyrocket.<sup>29</sup>) That estimate assumes that federal disaster

<sup>24</sup> The release of federal disaster assistance funds is triggered by a Presidential declaration under the Stafford Act in response to a state's request for federal assistance; the disbursements are paid out of the Disaster Relief Fund, which is funded by annual Congressional appropriations. Bruce R. Lindsay and Justin Murray, "Disaster Relief Funding and Emergency Supplemental Appropriations," Congressional Research Service R40708, April 12, 2011, p. 4

<sup>25</sup> The Disaster Relief Fund currently is funded to cover major disasters costing a maximum of \$500 million, through an average annual Congressional appropriation of about \$1 billion. CRS R40708, pp. 6 and 8

<sup>26</sup> William L. Painter and Jared T. Brown, "FY2013 Supplemental Funding for Disaster Relief," Congressional Research Service R42869, February 19, 2013, Summary

<sup>27</sup> "Disastrous Spending: Federal Disaster-Relief Expenditures Rise Amid More Extreme Weather," Center for American Progress, April 29, 2013, p. 2

<sup>28</sup> David R. Conrad and Edward A. Thomas, "Proposal 2: Reforming Federal Support for Risky Development," The Hamilton Project - Brookings, 2013, p. 2

<sup>29</sup> Cummins, Suher and Janjani, pp. 62-63 The \$20 billion estimate is based on the annual allocations to the Disaster Relief Fund from 2001 to 2005, which averaged \$1 billion, plus the supplemental allocations to the Fund over that period, which averaged \$16.5 billion, plus \$2.5 billion as estimated additional annual disaster assistance spending.

***Currently, federal disaster assistance funds are primarily directed to recovery and repair, with a relatively small amount expressly allocated to prevention.***

assistance will be level funded at \$20 billion and that there will be no increase in development in catastrophe-prone areas. Including future growth projections in the calculus, such as population growth along the coasts, would produce a considerably higher estimate of the annual cost of federal disaster assistance.<sup>30</sup>

The same study estimates that the net present value of the federal government's unfunded liability for disaster assistance appropriations over 75 years could be as much as \$7.1 trillion, well above the \$4.9 trillion net present value of the shortfall in the Social Security program over that same time period.<sup>31</sup>

Currently, federal disaster assistance funds are primarily directed to recovery and repair, with a relatively small amount expressly allocated to prevention. Only \$13 billion of the \$60.4 billion in supplemental disaster assistance funding and NFIP borrowing authority for Sandy is specifically allocated to projects to reduce vulnerabilities to future extreme weather events.<sup>32</sup> Tying at least some portion of federal disaster assistance funding to self-help measures by the states would force states to recognize the higher cost of rebuilding after an extreme weather event compared to investing in resiliency up front. Moreover, if states were to use a percentage of their federal disaster assistance funds to take steps to prevent and reduce damages from future natural catastrophes, states could help reduce the potential damages.

Individual states may choose to incorporate risk mitigation measures into their recovery efforts. The New York State Commission convened by the State's governor in response to extreme weather events, including Sandy, Hurricane Irene and Tropical Storm Lee, is an example of particularly comprehensive mitigation recommendations.<sup>33</sup> New Jersey provides an example of a state that is using federal disaster assistance funds to incorporate risk mitigation measures into its rebuilding after Sandy. Those measures include offers to buy out neighborhoods at risk of repetitive coastal flooding, the use of dunes and other natural barriers to slow down

flooding and building codes mandating the use of more resilient materials and standards. Governor Chris Christie appropriately has noted that through disaster assistance funds, all U.S. taxpayers are paying to rebuild New Jersey.<sup>34</sup>

A far greater emphasis on up-front natural disaster mitigation could further reduce the costs to taxpayers of extreme weather events. Investments to prevent and reduce losses not only protect people and property, they offer positive returns: every \$1 spent on prevention saves \$4 in damages, according to FEMA and to a widely-cited study by the Multihazard Mitigation Council of the National Institute of Building Sciences.<sup>35</sup>

Linking preventative measures to the amount of disaster assistance funding also would help ameliorate the tendency of some state and local officials to favor the perceived immediate benefits of developing areas prone to natural hazards, such as floodplains or areas that abut wildlands, over the longer term economic and health and safety benefits of investing to reduce damages from extreme weather events.<sup>36</sup> As the federal government noted in 1993, the unconditional availability of federal funding for disaster relief could inadvertently be contributing to natural disaster losses by reducing incentives for hazard mitigation and preparedness.<sup>37</sup>

The federal government could motivate state and local governments to adopt and enforce land use regulations and building codes that will help protect their inhabitants from particular climate perils through the Stafford Act. Perhaps the Stafford Act could be amended to tie a percentage of federal disaster assistance funds to states adopting and enforcing land use regulations and building codes that meet certain risk mitigation standards, with states that have failed to do so receiving less than the maximum 75 percent federal contribution if a natural disaster is declared.<sup>38</sup> Requiring that states also use a percentage of those funds to make their public infrastructure more resilient to extreme weather events is worth considering, as well.

30 Cummins, Suher and Zanjani, p. 62

31 Cummins, Suher and Zanjani, pp. 62-63; The net present value could be lower, depending on the assumptions used. Conrad and Thomas, p. 2, estimates that the net present value of the federal government's liability for unfunded disaster relief is \$5.7 trillion.

32 Conrad and Thomas, p. 2; Executive Office of the President, Office of Management and Budget, Letters to The Hon. John Boehner and The Hon. Harry Reid, December 7, 2012, p. 64

33 NYS 2100 Commission, "Recommendations to Improve the Strength and Resilience of the Empire State's Infrastructure"

34 "President Bill Clinton and Governor Chris Christie on Governing," Clinton Foundation, June 14, 2013, C-Span Video Library, <http://www.c-spanvideo.org/program/ChrisChris>

35 Multihazard Mitigation Council; FEMA Press Release Number 1662-023

36 GAO-07-403, "Natural Hazard Mitigation," August 2007, pp. 42-43

37 FEMA, "FEMA03: Create Results-Oriented Incentives to Reduce the Costs of a Disaster"

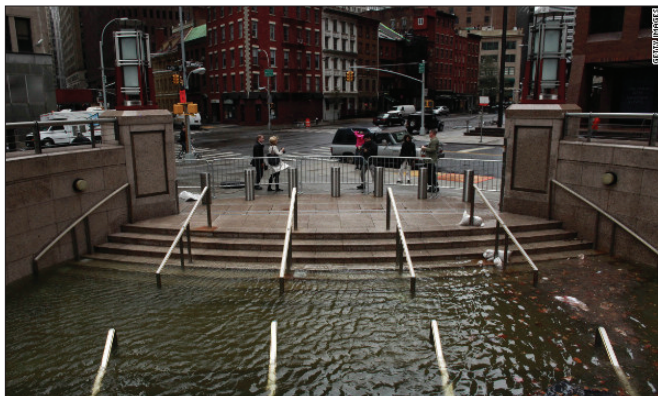
38 Bruce R. Lindsay and Francis X. McCarthy, "Stafford Act Declarations 1953-2011: Trends and Analyses, and Implications for Congress," Congressional Research Service R42702, August 31, 2012, pp. 25-26. The Stafford Act authorizes the President to allocate up to 75 percent of the cost of a natural catastrophe (or other disaster) towards measures to mitigate future damage or loss of life. That 75 percent has been increased to as much as 100 percent for certain hurricanes and other natural disasters. Francis X. McCarthy, "FEMA Disaster Cost-Shares: Evolution and Analysis," Congressional Research Service R41101, March 9, 2010, pp. 8-12



# SANDY MOTIVATED NEW YORK & NEW JERSEY TO INCORPORATE MITIGATION MEASURES INTO THEIR RECOVERY EFFORTS

## Severe Impacts of Hurricane Sandy

### New York State



- 265,000 business properties destroyed/damaged
- 19,729 flights canceled
- 2 nuclear power plants down
- Stock Exchange closed 2 days
- New York Marathon canceled
- Estimated cost to NY \$33b

### New Jersey



- Severe damage to infrastructure, mass transit & highway systems
- 2.6 million lost electricity
- 346,000 housing units damaged
- Estimated cost to NJ \$30b

Source: Swiss Re; AonBenfield Impact Forecasting. "Hurricane Sandy Event Recap Report"

Risk mitigation planning for natural hazards and implementation of those plans will be incomplete unless they take into account the current and future risks from the influences of climate change. The federal government could motivate states to account for such risks by conditioning FEMA approval and renewal of state hazard mitigation plans on the incorporation of current and future climate change risks into their planning scenarios: FEMA currently does not require this explicitly.<sup>39</sup>

Finally, there may be opportunities for the private insurance sector to complement public disaster relief and recovery programs. The Congressional Research Service has reported to Congress on some of the options for an expanded private market role in natural disaster recovery, including catastrophe risk insurance and alternative risk transfer techniques such as insurance-linked securities and catastrophic risk bonds.<sup>40</sup>

## OUR RECOMMENDATIONS FOR DISASTER ASSISTANCE FUNDS:

- Budget for the reasonably foreseeable annual costs of natural disaster assistance provided under the Stafford Act and reduce reliance on ad hoc funding when disasters occur
- Require that states use a percentage of federal disaster assistance funds to make their public infrastructure more resistant to extreme weather events
- Condition FEMA approval and renewal of state hazard mitigation plans on the incorporation of climate change risks into planning scenarios

<sup>39</sup> NRDC & NWF Petition to FEMA: Climate Change & Hazard Mitigation Planning, October 2, 2012. A state hazard mitigation plan is a prerequisite for obtaining federal mitigation assistance grants on a non-emergency basis.

<sup>40</sup> Rawle O. King, "Financing Natural Catastrophe Exposure: Issues and Options for Improving Risk Transfer Markets," Congressional Research Service R43182, August 15, 2013

# National Flood Insurance Program

Floods are the most common and destructive natural disaster in the United States.<sup>41</sup> In the U.S., floods are publicly insured through the National Flood Insurance Program (NFIP).<sup>42</sup> The program faces three significant challenges: the unmanageable debt it has accumulated; rising coastal property values; and near and longer term challenges of rising sea levels and other effects of climate change.

Participation in NFIP is mandatory for properties with federally insured mortgages that are located in a 100-year floodplain (that is, that have a 1 percent annual risk of flooding).<sup>43</sup> The federal government sets the premium rates, coverage limits and other terms and assumes the liability risk under the policies.<sup>44</sup> Private insurance companies sell the insurance policies and handle the claims under the policies, for a fee, but do not bear any of the financial risk under the policies.<sup>45</sup>

The program is in debt to U.S. taxpayers for up to \$30.4 billion, between the \$24 billion that the NFIP had borrowed from the U.S. Treasury as of May 2013 and the additional \$6.4 billion that remained of its \$9.7 billion increase in borrowing authority for flood damages from Sandy as of that date (more of which has been used since then). The program has no realistic way to repay that money.<sup>46</sup>

NFIP accrued that debt because it was structured to underprice the risk it covers, even though the original intent was that it would be funded by the policyholders it insures.<sup>47</sup> The program has underpriced its risk by subsidizing premiums for both subsidized policies (which are not means-based) and full-risk policies.<sup>48</sup> Policyholders with subsidized policies have paid only 45 percent of the cost of the flood risk from those properties, with taxpayers picking up the remaining 55 percent.<sup>49</sup> Full-risk policies also have been underpriced because the premium rates

were based on outdated data about the probability of flood risk (which NFIP is trying to rectify through remapping areas to the current flood risk) and other deficient data; the full-risk policies also cover properties that were grandfathered into NFIP below the full-risk premium rate.<sup>50</sup> Finally, in 2006 NFIP changed how it calculates the amount of premium it needs to collect annually to cover its losses, which has further underpriced its risk.<sup>51</sup>

The Government Accountability Office succinctly summarized the program's vulnerable position caused by underpricing its risk:

*Currently [2008], the annual amount that NFIP collects in both full-risk and subsidized premiums is not enough to cover its operating costs, claim losses, and principal and interest payments to the Department of the Treasury. Evidence suggests that flooding is likely to become more severe in the future, resulting in increased risk exposure, the potential for more catastrophic losses, and ongoing financial instability for the program. Without changes to its current rate-setting processes, NFIP premiums will be unlikely to be able to cover the program's claims, expenses, and debt, exposing the federal government and ultimately taxpayers to ever-greater financial risks, especially in years of catastrophic flooding.*<sup>52</sup>

Consequently, since 2006 NFIP has been on the GAO's list of programs that are at "high risk" of needing transformation.<sup>53</sup>

The Biggert-Waters Flood Insurance Reform Act of 2012 (Biggert-Waters) begins that transformation, including by phasing out underpricing of risk through subsidized premiums and phasing in risk-based premiums for all properties that reflect their true cost of flood risk.<sup>54</sup> But until these subsidies are fully phased out, the gap between premiums collected and NFIP's loss exposure will continue to grow.

41 GAO-13-568, "Flood Insurance, Implications of Changing Coverage Limits and Expanding Coverage," July 2013, p. 4

42 There is some private market flood insurance coverage in the U.S., as a supplement to NFIP coverage, principally for higher value commercial and residential properties. GAO-13-568, p. 4

43 GAO-09-12, p. 7

44 GAO-13-568, p. 4

45 GAO-13-568, p.4

46 GAO-13-607, p. 2; GAO, "2013 High Risk Report"

47 GAO-13-607, p. 35. Congress structured NFIP this way in 1974, when the first flood insurance rate maps were issued and properties were given grandfathered insurance premium rates.

48 NFIP has determined which type of policy a property should have according to when the property was built. Properties built in a 100-year floodplain before 1975 (that is, before building codes that took account of flood risk were adopted) or before the community had a flood insurance rate map (FIRM) have paid subsidized premiums; other properties (except those that had been grandfathered into the program at a lower rate) have paid a full-risk premium. GAO-09-12, pp. 5-6 and 8

49 About 21 percent of NFIP policyholders had subsidized policies when the Biggert-Waters Act was passed. GAO-13-607, "Flood Insurance, More Information Needed on Subsidized Properties," July 2013, p. 6

50 GAO-09-12, pp. 3-4

51 Until 2006 NFIP calculated the amount of premium needed to cover average annual losses based on historical loss data but NFIP changed that methodology in 2006 to exclude the catastrophic loss year of 2005 (four hurricanes, including Katrina), and future catastrophic loss years, from the historical data set so as to limit the increases to subsidized premiums. GAO-09-12, p. 4

52 GAO-09-12, pp. 4-5

53 GAO, "2013 High Risk Report, National Flood Insurance Program;" GAO-13-607, p. 2

54 If Biggert-Waters is fully implemented, subsidies will be phased out over five years for second homes, commercial properties, properties that have had severe repetitive losses, and properties that have received claims payments that meet the specified thresholds; subsidies for most primary residences will continue until the home is sold, the policyholder lets the policy lapse, the flood map for the area is changed in a way that results in a rate increase, or the policyholder refuses mitigation assistance. GAO-13-607, pp. 11-12

***In addition to the financial difficulties that subsidies have created for NFIP, masking the true cost of risk has encouraged practices that increase vulnerability to extreme flooding.***

Because NFIP has been underpriced for years, the premium increases, particularly for lower income and fixed income households, could be a challenge, as could the rate increases in areas that are being remapped to show current flood risk. It is clear that the affordability issues during the five-year transition period to risk-based rates and thereafter need to be studied and addressed in the near future, as intended by the Biggert-Waters reforms.<sup>55</sup> Providing targeted and means-tested assistance outside of the insurance premium rate structure to low-income households, rather than continuing to charge rates that underprice flood risk, will address affordability concerns without contributing to the solvency issues of the program.<sup>56</sup> One potential way of addressing affordability concerns for lower and fixed income households is through a means-based voucher program, similar to the low-income housing voucher program, coupled with hazard mitigation requirements and perhaps a loan program.<sup>57</sup>

However, rolling back or unduly delaying the implementation of the Biggert-Waters reforms, as some in Congress are advocating, will only postpone the inevitable day of reckoning. In the meantime, NFIP's debt to taxpayers will continue to mount, even in years without catastrophic flood losses, because of the continuing underpricing of risk. Catastrophic losses will accelerate the accrual of debt. As an example, in 2012 NFIP collected about \$3.6 billion in premiums and paid out over twice that amount, about \$7.8 billion, in Sandy-related and other flood losses.<sup>58</sup>

In addition to the financial difficulties that subsidies have created for NFIP, masking the true cost of risk has encouraged practices that increase vulnerability to extreme flooding, such as building in flood-prone areas and rebuilding to the same non-resilient standards, flood after flood. The disproportionate amount of claims paid for properties that have suffered repeat flood losses underscores the economic burden of these practices.<sup>59</sup>

The original rationale for subsidies was to motivate communities to adopt and enforce floodplain management ordinances to reduce future flood losses; subsidized rates were intended to

be only an interim step towards long-term adjustments to land use planning in the floodplains.<sup>60</sup> An unintended consequence of the subsidies was that politicians locked them in and for many, maintaining the subsidies became the goal, rather than promoting smart land use in the floodplains.

NFIP attempts to motivate communities to adopt smart land use standards and to implement flood prevention measures through the Community Rating System (CRS). CRS reduces premiums for communities that go beyond minimum NFIP requirements for managing their use of floodplains, by, for example, adopting and enforcing building codes with flood resistant standards. But despite premium reduction incentives and improved resiliency to floods for communities that participate in CRS, only 5 percent of the 21,000 communities that have NFIP coverage participate in the program. It is notable that the five percent of communities participating in CRS hold two-thirds of all NFIP policies.<sup>61</sup> Sandy, and changes to CRS in 2013, may improve participation rates.<sup>62</sup> Miami-Dade County in Florida is an example of a community that has benefited from CRS through NFIP premium reductions of up to 25 percent and through benefits of mitigation measures, such as reductions in flood insurance claims, repair costs and loss of wages.<sup>63</sup>

The low rate of participation in CRS may have less to do with the program's mechanics than with a lower level of interest in flood insurance, in general, than one would expect from property owners who are exposed to flood risk. Many exposed property owners either do not buy an NFIP policy (because they do not have a federally-insured mortgage and therefore are not required to do so) or drop their policy (maintenance of an NFIP policy generally is not tracked by mortgagors).<sup>64</sup> Researchers have identified some of the reasons for not buying an NFIP policy or for dropping the coverage, including unrealistic expectations of disaster immunity, lack of understanding about insurance, failure to do a cost-benefit analysis, and lack of desire (or inability) to pay insurance premiums.<sup>65</sup> Continuing public education about these issues could increase participation in NFIP, and in CRS as well.

55 FEMA has consulted with the National Academy of Sciences about how to do the affordability study. GAO-13-607, p. 36

56 See, for example, Smart Growth America, "Federal Involvement in Real Estate," July 2013, p. 3; Ethan Handelman of the National Housing Conference contributed to that report.

57 Association of State Floodplain Managers, Inc., "Flood Insurance Affordability," April 26, 2013, p. 2; Carolyn Kousky and Howard Kunreuther, "Addressing Affordability in the National Flood Insurance Program," Resources for the Future and Wharton Risk Management and Decision Processes Center, Issue Brief 13-02, August 2013, p. 14; GAO-13-607, pp. 35-40

58 FEMA, "Total Premium by Calendar Year," FEMA, "Significant Flood Events," as of July 31, 2013; Impact Forecasting, "Hurricane Sandy Event Recap Report, Aon Benfield, p. 3

59 Repetitive loss properties, which represent about 1 percent of NFIP properties, have received over 33 percent of NFIP claim payments. Rawle O. King, "National Flood Insurance Program: Background, Challenges, and Financial Status," Congressional Research Service R40650, July 1, 2011, p. 17

60 GAO-13-607, p. 9

61 FEMA, "Fact Sheet, Community Rating System"

62 FEMA, "Fact Sheet, Changes to the Community Rating System to Improve Disaster Resiliency and Community Sustainability"

63 Louisiana Resiliency Assistance Program, "Miami-Dade County, Florida—Community Rating System Success Story," June 17, 2013

64 Carolyn Kousky and Erwann Michel-Kerjan, "Hurricane Sandy, Storm Surge, and the National Flood Insurance Program, A Primer on New York and New Jersey," Resources for the Future, Issue Brief 12-08, November 2012, p. 2

65 Kousky and Michel-Kerjan, p. 3



***Nearly 16 percent of the total value of insured residential and commercial properties in the U.S. is located along the Gulf and Atlantic Coasts, with an aggregate value of over \$10 trillion.***

Ultimately, however, individuals must understand the consequences of choosing to build in or to remain in an area that is highly vulnerable to flood risk. Those consequences spread to the community at large, through physical risks to first responders to a natural catastrophe, calls on community resources and use of limited disaster assistance funds.

As a result of underpricing its risk and insufficient success in encouraging smarter use of the floodplains, NFIP has a multi-billion dollar debt it cannot pay, which is coupled with increasing loss exposure. In 2010, 39 percent of the U.S. population lived on the shoreline; by 2020 the shoreline population is projected to grow by another 8 percent.<sup>66</sup> A study commissioned from AECOM by FEMA estimates that the increase in population in coastal flood hazard areas will be about 60 percent by the year 2100 and that the total number of NFIP policies (both coastal and riverine) will increase by about 80 percent to 100 percent by then.<sup>67</sup>

## COASTAL POPULATIONS ARE GROWING



Image Source: Shutterstock; Data source: NOAA, "State of the Coast"

Coastal property values in NFIP's portfolio are growing as well. Nearly 16 percent of the total value of insured residential and commercial properties in the U.S. is located along the Gulf and Atlantic Coasts, with an aggregate value of over \$10 trillion; the total value of insured coastal property is projected to

double every 10 years.<sup>68</sup> If that projection proves accurate, the loss exposure of NFIP's current portfolio could double to \$2.6 trillion in 10 years. (NFIP covers insured property currently valued at around \$1.3 trillion.<sup>69</sup>) New development along the coasts could further ratchet up the value of NFIP's property portfolio and, therefore, NFIP's potential loss exposure.

Over the long term, however, climate change is the biggest risk to the viability of NFIP: by 2100 climate change will account for 70 percent of NFIP's increased risk exposure through growth in the number of policies (and population growth will account for the other 30 percent), according to the AECOM study.<sup>70</sup>

The effects of climate change may make the untenable financial position of NFIP irreversible. Historically, the rates set for full-risk policies, and for subsidized policies, have not taken the potential future effects of climate change into account because NFIP was designed to insure against current, not long-term, risk.<sup>71</sup> If NFIP is to become financially viable over the long-term, the program will have to take account of the long-term risks of climate change, particularly sea level rise and potentially more intense hurricanes and other coastal storms. This will require NFIP to update flood risk data, flood plain maps and premium calculations based on future projections of a changing climate, instead of relying solely on historical climate data. As AECOM found: "The NFIP has the opportunity now to plan for any potential issues or concerns related to the growth of the program and change in loss estimates."<sup>72</sup> Such calculations will need to include risk reduction factors, such as levees, if they are to accurately reflect the risk. As AECOM acknowledged, updating projections of the impact of climate change on NFIP will be an on-going effort, as climate change science evolves.<sup>73</sup>

States and localities also need to account for current and future effects of climate change in their flood planning. The federal government, through FEMA, could encourage states with NFIP policies to do so by conditioning approval and renewal of Flood Mitigation Assistance grants on the incorporation of climate change risks into their hazard mitigation planning.<sup>74</sup>

66 NOAA's State of the Coast

67 AECOM, "The Impact of Climate Change and Population Growth on the National Flood Insurance Program through 2100," June 2013, p. 6-2. The lower end of the estimate assumes that coastal shorelines will migrate inland with sea level rise and the upper end of the estimate assumes that shorelines will be buttressed to remain fixed against sea level rise. AECOM, pp. 4-7 and 6-2. FEMA commissioned the study in response to recommendations by the government auditor in 2007 that NFIP, and FCIP, "analyze the potential long-term fiscal implications of climate change" for the program and report the findings to Congress; both NFIP and FCIP agreed with the recommendations but to date, only NFIP has complied with them. GAO-07-285, "Climate Change, Financial Risks to Federal and Private Insurers in Coming Decades are Potentially Severe," March 2007, Highlights

68 AIR Worldwide, p. 3

69 GAO Press Release, GAO-13-568, July 3, 2013

70 AECOM, p. 6-2

71 GAO-09-12, p. 22

72 AECOM, p. 5-27. AECOM found that average annual insurance premium rate increases to reflect the increased loss exposure of NFIP from the effects of climate change and population growth would not be significant, although cumulatively, over the 90 years of the study, the rate increases would be significant; AECOM also found that continued grandfathering of underpriced insurance premiums would exacerbate NFIP's financial issues. AECOM, pp. 5-27 and 5-28.

73 AECOM, p. 6-3

74 NRDC & NWF Petition to FEMA. Flood Mitigation Assistance Grants are non-emergency grants to implement measures to eliminate or reduce the long-term risk of flood damage to NFIP insured properties.

NFIP was created, in part, to fill a void caused by the unwillingness of private insurers to underwrite flood risks.<sup>75</sup> There is no inherent reason, however, why private insurance for flood perils cannot be expanded in the U.S., as it has been in Europe.<sup>76</sup> Barriers that previously discouraged private market insurers from writing flood coverage in the U.S. are falling. FEMA now maps floodplains. Catastrophe risk modeling has become much more sophisticated since

NFIP was created. If the market conditions were right, “Flood is definitely insurable,” according to Jens Melhorn, Head of Flood Risk for global reinsurer Swiss Re.<sup>77</sup> Swiss Re believes private insurance could contribute to better flood protection in the U.S. through improved risk assessment models, innovative products customized to the needs of policyholders and rate competition.<sup>78</sup>

## OUR RECOMMENDATIONS FOR NFIP:

- Implement the Biggert-Waters Act reforms, including phasing in insurance premium rates that better reflect risk and developing affordability solutions that do not include rate discounts
- Incorporate climate change risks into flood plain maps, loss models and insurance premium rate-setting data, with due recognition of mitigating factors such as levees
- Condition FEMA approval and renewal of Flood Mitigation Assistance grants on incorporating climate change risks into planning scenarios

75 GAO-13-568, p. 4

76 Swiss Re, “Flood—an underestimated risk,” 2012, p. 17

77 Best’s Review, “Webcast Transcript: The State of Flood Insurance in the U.S.,” pp. 2, 8

78 Best’s Review, p. 13

# Federal Crop Insurance Program

Climate change presents significant risks to crop production in the U.S., now and in the future. The Federal Crop Insurance Program (FCIP), the primary policy tool that farmers use to manage their risks, is heavily subsidized and unnecessarily expensive to taxpayers and provides no incentives to farmers to use crop production methods that decrease the risk of crop loss and increase resiliency to extreme weather events. Similarly, FCIP gives private insurance companies that write FCIP coverage no incentives to manage those risks in the portfolio of farms they insure. As a result, FCIP's costs to taxpayers are soaring and will continue to do so unless the program is reformed to take account of climate impacts and to be more economical to operate.<sup>79</sup>

Climate change is predicted to have multiple effects in the U.S. that will negatively affect crop production, including more frequent droughts, more intense precipitation, more extreme hail, wind and temperature swings, and more weeds, pests and crop diseases.<sup>80</sup> The pace and intensity of climate change represent an unprecedented challenge to the sustainability of U.S. agriculture, according to the U.S. Department of Agriculture (USDA).<sup>81</sup> Some areas in the U.S. that are likely to be the most severely affected by the influences of a warming climate also are some of the most agriculturally productive areas.<sup>82</sup>

FCIP is a complex public-private partnership that offers subsidized insurance to farmers to manage the risks of low crop yields and/or revenue losses.<sup>83</sup> The crop insurance policies are written by private insurance companies that are approved to write such coverage by the USDA's Risk Management Agency (RMA): 18 companies have been approved to write crop insurance in 2013 and 2014.<sup>84</sup> RMA sets the premium rates, which are not competitive.<sup>85</sup> In 2011 the crop insurance program provided about \$113 billion in

coverage to about one million policies.<sup>86</sup> (One insurance policy insures a particular crop and one farmer or agribusiness may hold numerous policies.)

Taxpayers, through the federal government, subsidize the FCIP in three ways:<sup>87</sup>

- 1. Premiums (Cost of Risk):** The government pays, on average, about 62 percent of premiums charged to farmers (about \$7.4 billion in 2011)
- 2. Administrative and Operating Costs (Costs of Delivering the Program):** The government pays administrative and operating costs of the private insurers that provide the insurance to farmers (about \$1.3 billion in 2011)
- 3. Share of Losses (Costs of Claims):** The government pays a portion of those insurers' losses in years in which the payments to farmers exceed the premiums collected, in the form of reinsurance of those losses by the USDA

FCIP's claims payments are rising. From 2001 through 2010 crop losses insured by FCIP averaged about \$4.1 billion.<sup>88</sup> In 2011 FCIP paid record claims of about \$10.8 but that record was broken the very next year.<sup>89</sup> The \$17.3 billion paid for crop losses under FCIP for the 2012 drought was the highest loss payment ever and was about twice the average annual covered loss of \$9 billion.<sup>90</sup> Taxpayers picked up about 75 percent of those losses.<sup>91</sup> 2012 was a bad year for insurers as well, as they incurred an underwriting loss (\$1.3 billion) for only the second time since 2001 (the other loss year was 2002); taxpayers lost almost three times as much, however (\$3.7 billion).<sup>92</sup>

The primary beneficiaries of FCIP subsidies are the largest policyholders: the top 20 percent of policyholders received 80 percent of the subsidies in 2011 and 26 policyholders received over \$1 million each in premium subsidies, compared to an average premium subsidy of \$5,000

79 FCIP agreed with the government auditor's 2007 recommendation that FCIP analyze the potential fiscal implications of climate change to FCIP over the long-term; to date it has not done so. GAO-07-285, Highlights

80 Claire O'Connor, "Soil Matters: How the Federal Crop Insurance Program should be reformed to encourage low-risk farming methods with high-reward environmental outcomes," NRDC Issue Paper, August 2013, p. 12; Charles Walthall, "The National Climate Assessment and Agriculture," July 2012; Charles Walthall, "Climate Change and Agriculture," December 8, 2011

81 Charles L. Walthall, et al., "Climate Change and Agriculture in the United States: Effects and Adaptation," USDA Technical Bulletin 1935 (2012), p. 6

82 O'Connor, p. 12

83 Dennis A. Shields, "Federal Crop Insurance: Background," Congressional Research Service R40532, December 6, 2012, p. 2. See, also, O'Connor, for a description of the structure of the FCIP.

84 O'Connor, pp. 5-6

85 O'Connor, p. 5

86 GAO-12-256, Highlights

87 GAO-12-256, p. 7; CRS R40532, Summary

88 O'Connor, p. 3; USDA RMA

89 O'Connor, p. 3; USDA RMA

90 Munich Re Press Release, January 3, 2013. On a fiscal year basis the losses were about \$18.5 billion. USDA Risk Management Agency, "Fiscal year government cost of federal crop insurance".

91 Bruce Babcock, "Taxpayers, Crop Insurance and the Drought of 2012," Environmental Working Group, April 2013, p. 3

92 Babcock, April 2013, pp. 11-12

received by 80 percent of policyholders.<sup>93</sup> The top four percent of policyholders, primarily large farms, received one-third of all premium subsidies in 2011.<sup>94</sup>

Farmers and agribusiness are not the only beneficiaries of FCIP: private insurance companies have made billions of dollars from the program. According to a recent study, private insurers had aggregate underwriting gains of \$10.3 billion from 2001 through 2012; during the same period taxpayers lost \$276 million from the program.<sup>95</sup> By one estimate the insurance industry receives \$1 out of every \$2 that the government spends on crop insurance; another estimate puts the insurance industry's share at a whopping \$1.44 out of every \$1 in premium subsidies to farmers.<sup>96</sup>

### **DROUGHTS CAUSE CROPS TO WITHER & CROP INSURANCE COSTS TO RISE**



Image Source: <http://indianapublicmedia.org/earthheats/downeven-corn-crop-projections/> — Cindy 47452 (Flickr)

FCIP currently costs U.S. taxpayers about \$9 billion annually, and is projected to cost that much each year through fiscal 2022, between the taxpayer share of premium payments and administrative and operating costs paid to insurance companies and agents who sell crop insurance to farmers.<sup>97</sup> In other words, unless the program is reformed, taxpayers will pay a projected \$90 billion for the crop insurance program over the next 10 years, twice the amount of traditional farm subsidies.<sup>98</sup> Critics

contend that since the Depression, Congress has increased FCIP subsidies with every new farm bill and that the farm bills currently being debated in Congress would continue that trend, making FCIP even more expensive to taxpayers than the \$9 billion annual projection.<sup>99</sup> Moreover, the \$9 billion annual projection does not take into account the myriad ways in which the effects of climate change could dramatically increase crop losses and, therefore, FCIP taxpayer costs.

One study estimates that the net cost of the program to the federal government, that is, to taxpayers, from 1995 to 2012 was about \$59.3 billion (which does not include the \$12 billion in underwriting gains that the government paid to crop insurance companies during that period).<sup>100</sup>

Although FCIP performs a critical function, the program as currently structured is unsustainable. The program has been criticized for being a revenue-guarantee rather than a risk management tool,<sup>101</sup> and for rewarding risky farming practices that increase crop and soil vulnerabilities to floods, droughts and other extreme weather events instead of those that improve resiliency to such events.<sup>102</sup> The GAO has recommended reforming the program's subsidies.<sup>103</sup>

Because FCIP is so heavily subsidized it rewards short-term thinking without regard to long-term consequences. The subsidized premiums enable farmers to plant on wetlands and grasslands with no incentive to manage the environmental impact and no incentive to manage water usage, even in areas facing drought risks.<sup>104</sup> From 2008 through 2011, farmers plowed under wetlands and prairies equivalent to the state of Indiana in acreage (over 23 million acres), more acreage than was lost in the previous 40 years.<sup>105</sup> According to the National Resources Defense Council (NRDC), FCIP's current rate-setting structure rewards farmers who make riskier and environmentally unsound farming choices, such as planting on land unsuited to agricultural production, with lower premiums than those charged to farmers who engage in risk management practices that increase their crop yield without increasing their risk of loss or harming the environment.<sup>106</sup>

93 Faber and Cox, June 11, 2012

94 GAO-12-256, Highlights

95 Babcock, April 2013, p. 3

96 Stett Holbrook, "Crop Insurance a Boon to Farmers—And Insurers, Too," Food & Environment Reporting Network, June 18, 2012

97 Scott Faber and Craig Cox, "The Case For Crop Insurance Reform," Environmental Working Group, June 11, 2012; GAO-12-256, Highlights, referencing Congressional Budget Office projections

98 Faber and Cox, June 11, 2012

99 James B. Stewart, "Richer Farmers, Bigger Subsidies," *The New York Times*, July 19, 2013

100 Environmental Working Group, "Crop Insurance in the United States NEW DATA- Insurance Subsidies to Individual Policyholders" (The underwriting gains from 2001 through 2012 were lower than the underwriting gains from 1995 to 2012 because insurers incurred losses in 2002 and 2012.)

101 Bruce Babcock, "The Revenue Insurance Boondoggle: A Taxpayer-Paid Windfall for Industry," Environmental Working Group, p. 4: Over 80 percent of FCIP insurance policies insure business income, even if weather events have not caused losses in crop yields.

102 O'Connor, p. 3

103 GAO-12-256, Highlights

104 Scott Faber, "Crop Insurance: Bad For Taxpayers, Bad For The Environment," Environmental Working Group, July 13, 2012

105 Craig Cox, Andrew Hug and Soren Rundquist, "Paradise Lost, Conservation Programs Falter as Agricultural Economy Booms," Environmental Working Group, May 2013, p. 3

106 O'Connor, pp. 3 and 7



***“When you can remove nearly all the risk involved and guarantee yourself a profit, it’s not a bad business decision, I can farm on low-quality land that I know is not going to produce and still turn a profit.”<sup>107</sup>***

A Minnesota farmer — *The New York Times*

“When you can remove nearly all the risk involved and guarantee yourself a profit, it’s not a bad business decision,” a Minnesota farmer told *The New York Times*; “I can farm on low-quality land that I know is not going to produce and still turn a profit.”<sup>107</sup>

NRDC recommends that instead of encouraging risky farming practices through subsidized premiums, FCIP should be reformed to set risk-based rates which reward farmers who use soil management and other farming practices that increase resiliency to extreme weather events with lower premiums.<sup>108</sup> NRDC contends that such farming practices would reduce crop losses in the short-term, would protect agricultural land against longer-term impacts of climate change, and would save FCIP, and therefore taxpayers, money.<sup>109</sup> Risk-based rates could also be used to reward farmers who adopt farming practices that reduce greenhouse gas emissions, such as adjusting the way in which they fertilize crops.<sup>110</sup>

Changing FCIP’s rate-setting mechanism from noncompetitive rates set by the RMA to risk-based rates would have another benefit: it would give private crop insurers an incentive to manage risks in their farm portfolios and to consider new insurance products to supplement FCIP coverage. With noncompetitive rates, insurers are unable to send market

signals to discourage farmers who engage in risky farming practices.<sup>111</sup> Although crop insurers must offer coverage to any farmer who wants it, insurers have discretion over which type of policy to offer to a farmer.<sup>112</sup> Under FCIP’s current structure, however, insurers have little incentive to be concerned about risky farming practices or about which type of crop insurance policy to sell to a particular farmer because taxpayers bear so much of the cost of the program.<sup>113</sup> Using risk-based pricing and reducing taxpayer subsidies would encourage crop insurers to develop private insurance market products that complement FCIP coverage, which would benefit farmers, taxpayers and the economy.

Last, FCIP’s current rate-setting mechanisms look only at historical loss data.<sup>114</sup> To more accurately reflect risk, the future effects of climate change should also be taken into account.

The bottom line: reforming FCIP is an urgent priority, as increasingly frequent and severe extreme weather events already are driving up crop and program losses. A pilot program to test risk-based premium rates, as NRDC recommends, is advisable.<sup>115</sup> Agricultural economist Dr. Bruce Babcock has made other thoughtful recommendations for reforming FCIP subsidies.<sup>116</sup>

## OUR RECOMMENDATIONS FOR FCIP:

- Reform subsidies to make the program more cost-efficient
- Institute a pilot program that offers lower insurance premiums to farmers who adopt farming practices which increase resiliency to weather extremes, such as sustainable soil management practices, to reflect their reduced risk
- Incorporate climate change risks into insurance premium rate-setting

107 Ron Nixon, “Crop Insurance Proposal Could Cost U.S. Billions,” *The New York Times*, June 6, 2012

108 O’Connor, p. 3.

109 O’Connor, pp. 3 and 7

110 In 2011, greenhouse gas emissions from agriculture, including livestock, represented eight percent of all U.S. greenhouse gas emissions. EPA, Climate Change, “Sources of Greenhouse Gas Emissions”

111 O’Connor, p. 7

112 Babcock, April 2013, p. 4

113 Babcock, April 2013, p. 4

114 O’Connor, p. 7

115 O’Connor, p. 3

116 Babcock, April 2013, and Babcock, “The Revenue Insurance Boondoggle: A Taxpayer-Paid Windfall for Industry”

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# Wildfire Protection

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U.S. and state taxpayers are paying billions of dollars annually in wildfire protection costs and those costs are increasing as the effects of climate change cause longer wildfire seasons and increasingly severe wildfires. Like NFIP, those billions of dollars are oriented towards disaster response, rather than disaster prevention. Moreover, amounts budgeted for wildfire protection are inadequate to cover current costs, let alone future costs, from increasingly severe weather events.

Wildfire protection costs have tripled since the 1990s due to the effects of climate change, increased building in the Wildland-Urban Interface (WUI—homes in and near forests and other wildlands at risk from wildfire) and ill-advised historic fire management practices.<sup>117</sup> In the past 10 years federal government wildfire protection and suppression costs have averaged over \$3 billion annually, compared to about \$1 billion annually in the 1990s.<sup>118</sup> From FY 2008 through FY 2013, federal appropriations averaged \$3.5 billion a year.<sup>119</sup> FEMA's fire management assistance grants have more than tripled over the same period, to an average of over \$70 million annually.<sup>120</sup> State governments are spending up to another \$2 billion annually on wildfire protection and local governments are spending an unquantified amount.<sup>121</sup> Most of the government spending goes to fighting wildfires, leaving little money to spend on preventative measures to reduce wildfire risks.

According to a study by the Western Forestry Leadership Coalition of state forestry officials and the U.S. Forest Service, looking only at wildfire suppression costs does not give a true accounting of the costs of wildfires, which are two to 30 times higher than publicly reported fire suppression costs.<sup>122</sup> The true cost of wildfires includes property losses (insured and

uninsured), costs from events triggered by wildfires (flooding, erosion, mudslides), costs of infrastructure shut downs (including highways, airports and other modes of transportation), revenues lost to local businesses and relocated households, healthcare costs, and damages to ecosystems.<sup>123</sup>

Wildfire seasons are becoming longer and more severe as a result of climate change.<sup>124</sup> The wildfire season in the U.S. has expanded from four months to six months or longer: the wildfire season in the Western U.S. is over 200 days, almost 80 days longer than it was in the mid-1980s.<sup>125</sup> Warmer temperatures are causing earlier snowmelt (and less snow overall), which is extending wildfire seasons.<sup>126</sup> Years of drought have resulted in drier and more flammable vegetation.<sup>127</sup> Higher temperatures are increasing tree mortality directly, and indirectly through increasing and more damaging insect infestations.<sup>128</sup> Finally, fires burn hotter and are more difficult to control in higher temperatures.<sup>129</sup>

The cumulative effects of these trends are larger and more damaging wildfires: Arizona, Nevada, New Mexico, and Oregon all had record wildfires in the past two years.<sup>130</sup> Larger wildfires are also more difficult to control. This past summer, a wildfire in Arizona killed 19 elite firefighters who were overrun by its rapid spread.<sup>131</sup>

The number of people and properties exposed to wildfire risk also is growing, particularly from the increasing development of the WUI.<sup>132</sup> By one projection, the number of homes in the WUI by 2030 (2.2 million) will be almost double the number of homes that were in the WUI in 2001.<sup>133</sup> Only 15 percent of the WUI is on federal land, which means the federal government has little control over building activities in the

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117 Ross Gorte, "The Rising Cost of Wildfire Protection," *Headwaters Economics*, June 2013, p. 1

118 Gorte, p. 4; Ross W. Gorte, "Federal Funding for Wildfire Control and Management," *Congressional Research Service* RL33990, July 5, 2011, p. 13

119 Kelsi Bracmort, "Wildfire Management: Federal Funding and Related Statistics," *Congressional Research Service* R43077, August 30, 2013, p. 5

120 Gorte, p. 4

121 Gorte, p. 1

122 Western Forestry Leadership Coalition (WFLC), "The True Cost of Wildfire in the Western U.S.," April 2009, updated April 2010, p. 2

123 WFLC, p. 2

124 Wildfires affect the entire country (in 2011, for example, Delaware was the only state that was not affected by wildfire) and could become a high risk in previously low risk areas of the country. Munich Re, "Focus On: Wildfire Fighting," April 2013

125 Munich Re, April 2013

126 Gorte, p. 3

127 Gorte, p. 3

128 Gorte, p. 3

129 Gorte, p. 3

130 Gorte, p. 2

131 Associated Press, "Yarnell Fire kills 19 Arizona firefighters from Granite Mountain Hotshots," June 30, 2013

132 USDA OIG Report No. 08601-44-SF, "Audit Report, Forest Service Large Fire Suppression Costs," November 2006, p. 6

133 Munich Re, April 2013

## WILDFIRE PROTECTION COSTS HAVE TRIPLED SINCE THE 1990s



Image Source: NOAA; Data source: U.S. Forest Service; CRS Report RL33990, p. 13

WUI.<sup>134</sup> State and local governments, which have primary jurisdiction to regulate development in most of the WUI, would have a greater financial incentive to mandate zoning and building regulations that minimize wildfire risks if they had to bear more of the cost of fighting those wildfires, according to a federal audit report.<sup>135</sup>

Although it does not have jurisdiction over private land development, the federal government could encourage wildfire risk reduction and risk management by tying federal disaster relief and wildfire suppression funding to state and local actions to reduce and manage wildfire risks. Some states are acting on their own to encourage behavior to reduce and manage wildfire risks by, for example, requiring treatments of brush and other fuel for wildfires located on private property or by assessing homeowners a wildland fire prevention services fee, as California did in 2011.<sup>136</sup>

Private insurers pay for the increasing severity of wildfires, as well. One wildfire in Colorado in 2012 resulted in over \$350 million in insurance claims.<sup>137</sup> Aggregate insured losses from catastrophic wildfires in 2012 totaled \$595 million.<sup>138</sup> While these losses are relatively small by industry standards, they may be a harbinger of a growing exposure from increasingly frequent and more severe wildfires, combined with increasing development in vulnerable areas that is putting more people in harm's way.

As a result, more insurers are educating policyholders about protecting their properties from wildfires and may even assist with that effort. Chubb Wildfire Defense Services, for example, automatically deploys trained firefighters to take precautionary measures to minimize the damage to high-value homes of certain policyholders if there is a wildfire in the vicinity of those homes.<sup>139</sup> The Insurance Institute for Business & Home Safety makes recommendations for wildfire loss control measures.<sup>140</sup>

Federal fire and land management officials acknowledge that more firefighters will be put at risk and more homes will burn if we continue to spend more taxpayer dollars on fighting wildfires than on preventing them; yet, we continue to allocate federal resources to disaster assistance rather than to disaster prevention.<sup>141</sup>

Pursuing more effective and efficient wildfire prevention measures makes sense. Closing our eyes to the ways in which climate change is contributing to longer and more intense wildfire seasons, which will put more lives, properties and taxpayer dollars at risk, does not. Public and private action to adapt to wildfire risks is urgently needed but is not enough: to be sustainable over the long-term, we also need to reduce the greenhouse gas emissions that are contributing to drought, extreme heat and other conditions that influence wildfire formation.

### OUR RECOMMENDATIONS FOR WILDFIRE PROTECTION:

- **Allocate substantially more federal and state resources to wildfire prevention measures and consider climate change effects on wildfires in determining the appropriate level of resources**
- **Require that states use a percentage of federal financial assistance for wildfire suppression to improve wildfire protection**
- **Adopt and enforce state and local regulations that require wildfire risk reduction actions by property owners, such as set-back requirements**

134 USDA OIG Report No. 08601-44-SF, p. 7

135 USDA OIG Report No. 08601-44-SF, p. 9

136 Gorte, p. 11

137 "Opening Statement of Chairman Ron Wyden, Wildland Fire Management Oversight Hearing," June 4, 2013

138 Loretta Worters, "Living in the Red Zone: Wildfires and Your Insurance Policy," Equifax Finance Blog, Insurance, July 15, 2013

139 "Chubb Wildfire Defense Services Frequently Asked Questions"

140 IBHS, "Wildfire"

141 "While mourning 19 dead, US again prepares to ax wildfire prevention funds," Bill Dedman, NBC News, July 9, 2013



# State Residual Insurance Market Plans

State-run insurance plans for high-risk properties, most of them along coastlines, are another form of taxpayer subsidized property insurance. The plans encourage building in high-risk areas if their rates underprice that risk. These publicly run plans are known as the residual market. The residual market has grown dramatically in recent years, increasing the exposure to state taxpayers if their state-run plan is unable to cover underwriting risks and passes the costs to taxpayers through assessments or general revenue costs. For example, the Texas plan is in a difficult financial position because of loss exposure from hurricanes. And, the residual market exposure will continue to grow with rising sea levels, greater coastal population densities and higher property values in vulnerable areas.

The residual market for property insurance originally was intended to be “insurance of last resort” for high-risk property owners who were unable to obtain coverage from the standard private insurance market. Instead, residual market property insurance companies have become major players in many coastal states and in some states, they have become the first insurer of choice even where standard market coverage is available.<sup>142</sup>

The residual market consists of three types of insurance plans. The FAIR (Fair Access to Insurance Requirements) Plans hold the largest share of the residual market risk.<sup>143</sup> FAIR Plans, which originally were designed to provide insurance in lower income urban areas, now often are used for property insurance in coastal areas, as well as in urban areas. Beach and Windstorm Plans insure only wind risks in coastal areas. Florida and Louisiana each have state-run insurance companies, Florida Citizens Property Insurance Corporation and Louisiana Citizens Property Insurance Corporation, both of which provide property insurance throughout their respective states, including FAIR Plan and Beach and Windstorm Plan coverage.

Overall, the residual market loss exposure has been growing at an annual rate of almost 18 percent.<sup>144</sup> The FAIR Plans, which hold the majority of the policies and of the exposure

in the residual market, collectively had their loss exposure increase from about \$40 billion in 1990 to over \$660 billion in 2010, an increase of almost 1,550 percent; Beach and Windstorm loss exposure over the same period increased by over 550 percent, from about \$14 billion in 1990 to over \$95 billion in 2010.<sup>145</sup>

The main factors behind the growth in the residual market loss exposure are the population growth along the coasts and the increase in value of insured properties, combined with the increase in the frequency and severity of extreme weather events, particularly hurricanes.<sup>146</sup> As coastal population and property values continue to grow, so will the loss exposure of the residual market. Another factor contributing to the residual market growth is the change in purpose of the FAIR plans, which have transformed from their original purpose of urban property insurers to coastal property insurers in many states.<sup>147</sup>

The residual market benefits taxpayers by making insurance available to property owners who might be unable to obtain insurance in the private market; however, all state taxpayers may pay for that coverage in years in which losses exceed the ability of FAIR or Beach and Windstorm Plans to cover loss payouts. Many residual market plans operate at a loss or with a slim surplus, making them particularly vulnerable financially in years in which a hurricane or other covered catastrophic weather event occurs.<sup>148</sup> State law obligates those plans to assess participating insurers to cover losses and many states permit insurers to recover the cost of the assessment through rate surcharges.<sup>149</sup> In Florida, those surcharges are paid for by virtually everyone who has insurance through surcharges on their auto insurance, liability insurance and other types of insurance, in addition to property insurance.<sup>150</sup>

If plans are unable to fund their losses, states may use general revenue funds to bail out the plans, which, like other government bailouts, passes the costs directly to taxpayers.<sup>151</sup> For example, in 2006 the Florida state legislature appropriated \$715 million to Citizens Property Insurance Corporation to cover a substantial amount of its 2005 plan year deficit.<sup>152</sup>

142 Robert O. Hartwig and Claire Wilkinson, “Residual Market Property Plans: From Markets of Last Resort to Markets of First Choice,” Insurance Information Institute, July 2012, p. 2

143 As of fiscal year 2010, 32 states and the District of Columbia had FAIR Plans and five states had Beach and Windstorm Plans (three of which also had FAIR Plans). Hartwig and Wilkinson, pp. 11-12

144 Hartwig and Wilkinson, p. 2

145 Hartwig and Wilkinson, pp. 5-6

146 Hartwig and Wilkinson, pp. 14-15

147 Hartwig and Wilkinson, p. 14

148 Hartwig and Wilinon, p. 21

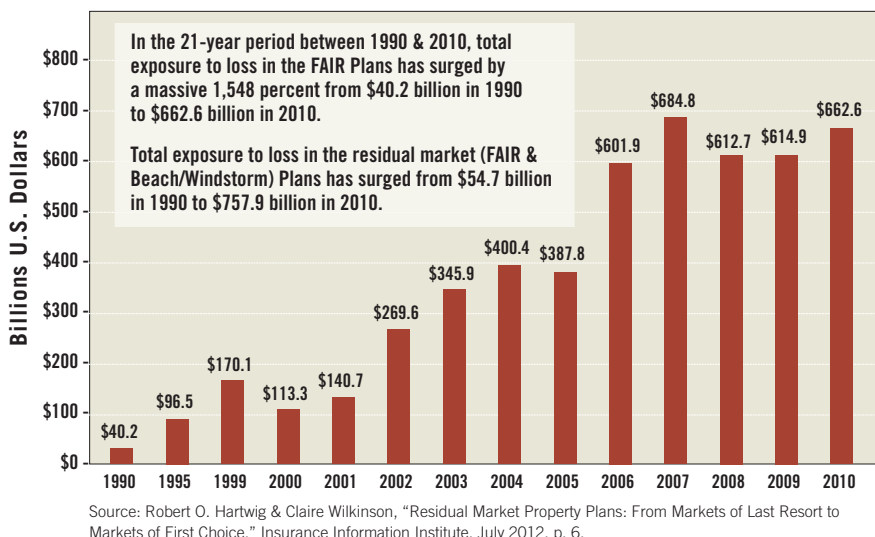
149 Hartwig and Wilkinson, p. 24

150 Hartwig and Wilkinson, p. 27

151 Hartwig and Wilkinson, p. 25

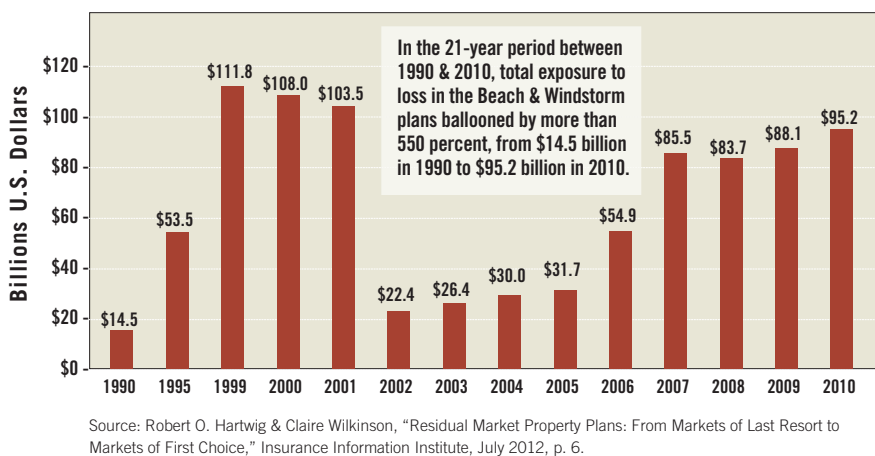
152 Florida Office of Insurance Regulation, “Informational Memorandum OIR-06-023M,” November 20, 2006

## U.S. FAIR Plans Exposure to Loss (US\$Billions)



## U.S. Beach & Windstorm Plans Exposure to Loss (US\$Billions)

In 2002, Florida combined its Windstorm & Joint Underwriting Association to create Florida Citizens, therefore Florida data shifted to the FAIR plans from this date.



***If plans are unable to fund their losses, states may use general revenue funds to bail out the plans, which, like other government bailouts, passes the costs directly to taxpayers.<sup>151</sup>***

Similarly, in 2007 the Mississippi legislature allocated \$80 million in state and federal funds to the Mississippi FAIR plan to help cover its costs, plus an additional \$80 million in state funds payable in \$20 million installments over four years.<sup>153</sup> Moreover, using state funds to bail out the state-run insurance plans diverts state funds from infrastructure, schools, social services, and other health and welfare matters that pertain to all inhabitants of the state.

In some states, the residual market may find that it does not have the option of being bailed out by the state. The Texas Attorney General recently issued a legal opinion holding that the state legislature is not obligated to pay unfunded losses that the Texas Windstorm Insurance Association (TWIA) is unable to pay.<sup>154</sup> In other words, TWIA lacks sufficient capital to cover its loss exposure and will be unable to pay future claims to its policyholders unless the state provides funding.<sup>155</sup>

<sup>153</sup> Hartwig and Wilkinson, p. 40

<sup>154</sup> Opinion No. GA-1012, Attorney General of Texas, July 1, 2013

<sup>155</sup> TWIA, whose financial position has been stressed by claims and lawsuits arising out of Hurricane Ike in 2008, has been under the supervision of the Texas Department of Insurance since 2011. Stephanie K. Jones, "Texas AG: State Not on the Hook for TWIA Unfunded Losses," Insurance Journal, July 9, 2013

Although the residual market was designed to work in concert with the private insurance market and to charge risk-based rates that were higher than rates charged by the private market (to reflect the higher likelihood of loss of the riskier properties insured by the residual market), most of the plans, as a result of legislative action, charge rates that underprice risks.<sup>156</sup> (Louisiana, which seeks to discourage participation in its Plan, is a notable exception.)<sup>157</sup>

When state-run plans try to maintain risk-based rates, they often run into opposition from state regulators and policyholders. The Massachusetts FAIR Plan, for example, has sought a rate increase that would take into account the rising cost of reinsurance for the plan and new models showing that the state is facing more vulnerability to hurricanes, with communities along the coasts seeing greater rate hikes than other communities.<sup>158</sup> If the Massachusetts FAIR Plan wins regulatory approval for the proposed rate increase, it will be the first rate increase in eight years of trying.<sup>159</sup> Many elected insurance commissioners refuse to allow rate increases, which are politically unpopular, and instead gamble that loss funding will be provided by the federal or state government. That is not a sustainable business model, and, as the TWIA example shows, that gamble also may turn out to be politically fraught if the funding is not provided.

Citizens Property Insurance Corporation in Florida has undertaken various measures to reduce the risk it underwrites, the most controversial of which is “takeout policies” in which Citizens transfers certain policies to the private market.

Citizens has been aggressively shifting policyholders into the private market, with the goal of moving up to 50 percent of its 1.3 million policies into the private market.<sup>160</sup> In January 2014 Citizens will launch a clearinghouse to match current Citizens policyholders and new applicants with private insurance market companies because: “Policies written with Citizens when private-market coverage is available increase both Citizens’ potential claim exposure and the risk of assessments for all Floridians.”<sup>161</sup> Shifting to private insurance market coverage will be mandatory for many current policyholders.<sup>162</sup>

Underpricing the risk assumed by state insurers of last resort encourages policyholders to build and rebuild in high risk areas, such as barrier islands, thereby increasing the risk assumed by plans in those states. Plans that have underpriced the risk to the extent that the state insurer of last resort has become the insurer of choice run the additional risk of making the properties in their state less insurable in the private insurance market, which cannot compete with such highly subsidized rates.

Part of the solution may be excluding coverage for new development in high-risk zones. Another remedy may be creating conditions for increased private market coverage for some of that risk to enable state-run plans to once again become insurers of last resort rather than insurers of choice. Yet another potential remedy is boosting the use of reinsurance and alternative financing mechanisms, such as catastrophe bonds and catastrophe risk swaps, to cover catastrophic losses.<sup>163</sup>

## OUR RECOMMENDATIONS FOR STATE RESIDUAL MARKETS:

- Consider excluding coverage for new development in locations at high risk of damage from natural disasters, such as barrier islands
- Charge insurance premium rates that truly reflect risk
- Incorporate climate change risks into insurance premium rate-setting

156 GAO-10-568R, “Natural Catastrophe Insurance Coverage,” May 17, 2010, Cover Letter, p. 3; Hartwig and Wilkinson, p. 24

157 GAO-10-568R, Cover Letter, p. 3;

158 “Mass. FAIR Plan Seeks Rate Hike; Expert Witnesses to Testify on Insurer’s Behalf,” *Insurance Journal*, April 28, 2013

159 “Mass. FAIR Plan Seeks Rate Hike; Expert Witnesses to Testify on Insurer’s Behalf,” *Insurance Journal*, April 28, 2013

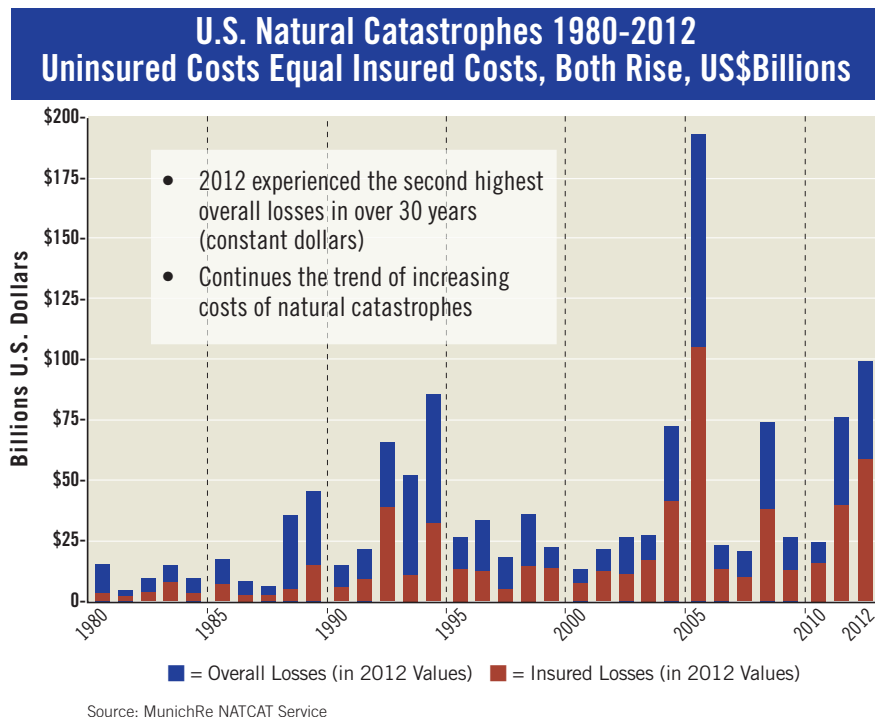
160 Toluse Olorunnipa, “Despite no hurricanes, many takeout insurers fail,” *Miami Herald*, June 3, 2013

161 Citizens Clearinghouse Project, “New Year, New Insurance Options for Florida Homeowners”

162 Shifting will be mandatory for current policyholders if the private market insurance premium does not exceed their current insurance premium to Citizens and for new applicants if the private market insurance premium is no more than 15 percent higher than the insurance premium that Citizens would charge. Citizens Clearinghouse Project; Martha Brannigan, “Citizens’ board Oks rate hikes for 2014,” *Miami Herald*, June 26, 2013

163 CRS R43182, pp. 19-25

# Longer Term Indirect Costs



The direct costs of an extreme weather event include physical damage to public infrastructure, buildings, modes of transport, and, individuals, as well as business interruption costs. Roughly half of direct costs are privately insured and half are paid for out-of-pocket by businesses and individuals and by the public sector. Both insured direct losses and uninsured direct losses (often referred to as economic losses) from extreme weather events are growing as such events become more frequent and more severe. The total direct damages in the U.S. in 2012, from both insured and uninsured natural catastrophe losses, were about \$110 billion, the second highest in over 30 years.<sup>164</sup>

The more difficult costs to calculate are the indirect costs, some of which are temporary and many of which continue indefinitely into the future. Those losses include foregone revenue, such as business losses from office closures and from reduced productivity of employees who spend additional time commuting or who cannot reach the office, lost tax revenues, canceled business and tourist travel to affected

areas, loss of wages from closed businesses, inability to obtain goods due to disruptions in the supply chain, and, in extreme cases, flight from neighborhoods and the failure of businesses to reopen.

There is little data about the long-term economic costs of natural disasters but even the limited analyses available indicate that those costs are high and may continue for years. Five months after Sandy hit New York, about 20 percent of affected businesses remained closed.<sup>165</sup> The lost revenue and wages will result in a decrease in tax revenue: New York City tax revenue is estimated to decline by approximately \$160 million as a result of economic losses attributed to Sandy.<sup>166</sup>

The Insurance Institute for Business & Home Safety estimates that 25 percent of small businesses never reopen after a hurricane, flood, wildfire or other catastrophic event.<sup>167</sup> As small businesses employ about half of the private sector workforce (60 million people), small business closures and disruptions from extreme weather events have long-term consequences for the economy.<sup>168</sup>

<sup>164</sup> MunichRe NATCAT Service (\$100 billion); The White House, "President Obama's Plan to Fight Climate Change," June 25, 2013, p. 2 (\$110 billion)

<sup>165</sup> New York City CDBG-DR Action Plan, p. 69

<sup>166</sup> New York City CDBG-DR Action Plan, p. 69

<sup>167</sup> Institute for Business & Home Safety (IBHS), Small Business Majority and American Sustainable Business Council, "Climate Change Preparedness and the Small Business Sector," July 2013, p. 3; "A Disaster Protection and Recovery Planning Toolkit for the Small to Mid-Sized Business," 2007

<sup>168</sup> IBHS, p. 4; "Moving America's Small Businesses & Entrepreneurs Forward," National Economic Council and the Small Business Association, May 2012, Introduction

*The economic cost of deterioration in quality of life caused by extreme weather events is difficult, if not impossible, to quantify.*

Extreme droughts, like extreme storms, also have long-term economic impacts. It is difficult to calculate the long-term indirect costs to federal and state governments and to taxpayers from extreme droughts because the effects of such droughts are so pervasive. The long-term effects of extreme drought may include restrictions on municipal and industrial water uses, limitations on the efficiency of hydropower generation and power plant production, disruption to and limits on navigation, increased fire risk, price increases for certain consumer staples, such as food and apparel, and damage to certain species, which has a ripple effect.<sup>169</sup>

Lost lives and health care costs caused by the effects of climate change have long-term consequences for the economy, in addition to the pain and suffering they cause to the individuals and families affected. One study estimated that six categories of events or episodes caused by the effects of climate change between 2000 and 2009 cost about \$14 billion in lost economic value of lives cut short and about \$740 million in health care costs.<sup>170</sup> The six categories were: ozone air pollution in the U.S. from 2000 to 2002; heat waves in California in 2006; hurricanes in Florida in 2004; infectious

disease outbreak (West Nile Virus) in Louisiana in 2002; river flooding (Red River) in North Dakota in 2009; and wildfires in Southern California in 2003.<sup>171</sup> That \$14 billion price tag does not include the cost of other health effects from a warming climate, such as water borne illnesses, increased incidences of food borne illnesses, causation or exacerbation of chronic illnesses, mental health illnesses, and the long-term health effects on populations displaced by storms.<sup>172</sup>

The economic cost of deterioration in quality of life caused by extreme weather events is difficult, if not impossible, to quantify. For individuals and communities that have been severely affected, that cost may manifest itself in increased time spent on the daily necessities of life, for example. Although those costs are not paid for out of the pockets of taxpayers, those costs are rightfully included when weighing the short-term cost of measures to prevent and reduce damages from extreme weather events against the long-term gains of maintaining a vibrant and productive society.<sup>173</sup>

169 CRS RL34580, 2013, p. 28

170 Kim Knowlton, Miriam Rotkin-Ellman, Linda Geballe, Wendy Max, and Gina M. Solomon, "Six Climate-Change Related Events In The United States Accounted For About \$14 Billion In Lost Lives And Health Costs," *Health Affairs* 30:11, November 2011, p. 1

171 Knowlton, et al, pp. 2-3

172 Knowlton, et al, p. 7

173 Jaison R. Abel, Jason Bram, Richard Deitz, and James Orr, "The Welfare Costs of Superstorm Sandy," *Liberty Street Economics*, December 18, 2012

# Expanded Private Insurance Sector Role

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***“The RAA has long supported a private sector role in underwriting flood risk.”***

Frank Nutter, President of the Reinsurance Association of America

***Updating our infrastructure is a big task... As insurers, we can provide our technical and risk-solutions knowledge to help move these efforts forward.***

Tony Kuczinski, President and CEO of Munich Re America

***“People often ask whether we can afford to reduce greenhouse gas emissions and adapt society to climate change. But I think the real question is can we afford not to?”***

Mark Way, Head Sustainability Americas

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Insurance industry regulators recognize that the private insurance sector can and should help motivate actions that mitigate the risks of extreme weather events:

*Insurers have the potential, in keeping with their historical role, to be significant innovators in contributing to the solutions of climate change by managing and mitigating both the causes and the impacts of catastrophes brought on by such change. For example, insurers can create new products that increase incentives for behavioral change, lobby for regulatory change necessary to reduce risks, participate in the establishment and enforcement of progressive building codes and land use planning guidelines, and show industry leadership by expanding the assessment of climate change risks. Such efforts could yield long-term benefits for the insurer, where it benefits from lower and more manageable catastrophe losses resulting from such changes.<sup>174</sup>*

At least some private sector insurance leaders seem willing to insure flood risk if the market conditions are right and to change historical business practices (such as changing loss models, which have relied solely on historical data, to include forward-looking data) to do so.

For example, Frank Nutter, President of the Reinsurance Association of America, has said, “The RAA has long supported a private sector role in underwriting flood risk,” and that evaluating flood-risk on a forward-looking basis, rather than on historical models, is critical to achieving the President’s climate action goals for the insurance industry.<sup>175</sup>

Another industry leader, Tony Kuczinski, President and CEO of Munich Re America, has pledged insurance industry expertise to help make communities and infrastructure more resilient to extreme weather events:

*We can no longer keep our fingers crossed and hope we can withstand the increasingly severe weather we have been experiencing. Updating our infrastructure is a big task... As insurers, we can provide our technical and risk-solutions knowledge to help move these efforts forward. The time to act is now as the longer we wait, the more expensive the price tag will be.<sup>176</sup>*

A third industry leader has acknowledged the need to address greenhouse gas emissions: “People often ask whether we can afford to reduce greenhouse gas emissions and adapt society to climate change. But I think the real question is can we afford not to?” (Mark Way, Head Sustainability Americas, in support of President Obama’s Climate Action Plan)

Even Florida, the state with the highest hurricane risk in the nation, is seen as a potential opportunity for the private insurance market:

*Florida’s unique hurricane risk does not scare away reinsurers—but rather Florida is seen as a place where every reinsurer in the world wants a piece of the action. These companies compete vigorously for Florida’s business, make Florida’s risks more affordable by spreading them around the world, and constantly pursue innovation to make their products and services more valuable.<sup>177</sup> (Bradley Kading, Executive Director of the Association of Bermuda Insurers and Reinsurers)*

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<sup>174</sup> National Association of Insurance Commissioners, “The Potential Impact of Climate Change on Insurance Regulation,” 2008, p. 4, citations omitted

<sup>175</sup> Reinsurance Association of America Press Release, “RAA Commends President’s Climate Action Plan”

<sup>176</sup> Statement of Anthony J. Kuczinski, President and Chief Executive Officer, Munich Reinsurance America, Inc., in support of the President’s Climate Action Plan, June 2013

<sup>177</sup> “Let private market carry Florida’s reinsurance risk,” Tallahassee.com, June 21, 2013

# Conclusion

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**Each of our public programs that pay for disaster relief** and recovery from extreme weather events—ad hoc disaster assistance appropriations, flood insurance, crop insurance, wildfire protection, and state-run “residual market” insurance programs—is highly exposed to catastrophic weather events. As climate change results in more frequent, volatile and damaging extreme weather across the country,

the potential liabilities of these public programs and the bottom line costs to taxpayers will soar. Continuing to ignore these escalating risks may be more comfortable than confronting the challenges of climate change, but inaction is the far riskier and more expensive path.

Accordingly, the Ceres report author makes the following recommendations:

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## OUR GENERAL RECOMMENDATIONS FOR ALL PROGRAMS

- **Transparency:** Acknowledge and account for the costs of extreme weather events to federal disaster relief and recovery programs by identifying, in one easily accessible website, all federal programs that disburse funds for natural disaster relief and recovery, including annual and supplemental disaster assistance appropriations for natural catastrophes, the National Flood Insurance Program, the Federal Crop Insurance Program, and wildfire protection funding. Take similar action at the state level.
- **Research:** Undertake the necessary research to understand how climate change will impact such programs to inform the adoption of measures to make these programs more sustainable over the long-term
- **State and Local Action:** Adopt and enforce land use regulations that maintain natural barriers (such as dunes and wetlands) and that prohibit development in areas that are highly vulnerable to floods or wildfires; adopt and enforce building codes that mandate the use of weather resistant construction practices and materials
- **Increase Level of Private Insurance Market Participation:** Explore ways to increase private insurance market participation to complement public disaster relief and recovery programs and in pricing insurance premiums, consider the use of forward-looking catastrophe risk modeling that takes appropriate account of climate change risks
- **Mitigation:** Adopt policies in both the public and private sectors to aggressively reduce greenhouse gas emissions in order to promote long-term sustainability



## OUR PROGRAM-SPECIFIC RECOMMENDATIONS

### Disaster Assistance:

- Budget for the reasonably foreseeable annual costs of natural disaster assistance provided under the Stafford Act and reduce reliance on ad hoc funding when disasters occur
- Require that states use a percentage of federal disaster assistance funds to make their public infrastructure more resistant to extreme weather events
- Condition FEMA approval and renewal of state hazard mitigation plans on the incorporation of climate change risks into planning scenarios

### National Flood Insurance Program:

- Implement the Biggert-Waters Act reforms, including phasing in insurance premium rates that better reflect risk and developing affordability solutions that do not include rate discounts
- Incorporate climate change risks into flood plain maps, loss models and insurance premium rate-setting, with due recognition of mitigating factors such as levees
- Condition FEMA approval and renewal of Flood Mitigation Assistance grants on incorporating climate change risks into planning scenarios

### Federal Crop Insurance Program:

- Reform subsidies to make the program more cost-efficient
- Institute a pilot program that offers lower insurance premiums to farmers who adopt farming practices which increase resiliency to weather extremes, such as sustainable soil management practices, to reflect their reduced risk
- Incorporate climate change risks into insurance premium rate-setting

### Wildfire Protection:

- Allocate substantially more federal and state resources to wildfire prevention measures and consider climate change effects on wildfires in determining the appropriate level of resources
- Require that states use a percentage of federal financial assistance for wildfire suppression to improve wildfire protection
- Adopt and enforce state and local regulations that require wildfire risk reduction actions by property owners, such as set-back requirements

### State-Run Insurance Plans:

- Consider excluding coverage for new development in locations at high risk of damage from natural disasters, such as barrier islands
- Charge insurance premium rates that truly reflect risk
- Incorporate climate change risks into insurance premium rate-setting

As this report opened with a quote from President John F. Kennedy, it seems only fitting to conclude with one:



*"Our problems are man-made; therefore, they may be solved by man.  
No problem of human destiny is beyond human beings."*<sup>178</sup>

— President John F. Kennedy

178 <http://www.jfku.edu/About-Us/The-JFK-University-Story.html>



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