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Committee on Rules
Subcommittee on Legislative and Budget Process

"Examining Community Resilience & the Impacts of Natural Disasters on the Budget Process"

Testimony of Heather McTeer Toney
National Field Director
Moms Clean Air Force
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Chairman Hastings, Ranking Member Woodall, and member of the Subcommittee, thank you for the opportunity to testify about the role of resiliency in facing the impacts of natural disasters.

My name is Heather Toney. I serve as National Field Director of Moms Clean Air Force, a community of over one million moms and dads united against air pollution and climate change for the sake of our children's health. My road to this position traveled through public service: I previously served as Regional Administrator for the Environmental Protection Agency's Southeast Region under President Barack Obama. I am also a former mayor, having served my hometown of Greenville, Mississippi, for two terms.

When our first major flood hit in 2008, I was beginning my 2nd term and really focusing on infrastructure development in the city. I'd spent my entire first term bringing the city back from the brinks of financial ruin as we were heavily in debt and needed rebuilding badly. After carefully cutting and saving, we were excited to continue street rebuilding and preparing our city's foundation for economic development. When the northeast's winter snow began melting and flowing downriver to our banks, we saw that the river was going to be high. It reached and stayed at flood stage for over month. Homes were flooded, fields were lost, waterlines broke, sewer lines leaked. What I was not prepared for was the impact this would place on our city budget.

Cities are required to submit a balanced budget to the state no later than September 15th as the new budget year begins on October 1st. For this reason, most cities begin budget sessions in late July to August in order to adequately prepare, debate and vote. When an extreme weather event such as a flood, hurricane or storm hits during the spring or summer months, the city must allocate funds to address the need without the assurance of money to replace the money used. For example, the money used for police and fire overtime due to a federal emergency extreme weather crisis are not only not budgeted, they are not replaced in time for the current budget cycle due to length of time it takes to receive a federal declaration, assessment of damages and receipt of funds.

In 2011 when the crisis flood waters returned, I'd learned a few lessons. Fellow mayors reached out to each other to provide immediate assistance. Harvey Johnson, Mayor of Jackson, MS, sent public works crews with concrete barriers to help us fill the gaps in our levee system. In turn, once we were secured we sent our emergency management personnel to Vicksburg, MS to assist them in preparing for the flood waters headed their way. Even though no one can budget for a storm, we saved as much as we could. We had to forgo needed city assessment purchases. We worked with local churches to help prepare the community for the impeding devastations. We relied on each other because all we had was each other. My Facebook post to the community on May 22, 2011 read:

"Toured Vicksburg's flooded areas this morning with Mayor Paul E. Winfield. He's doing a great job and is on top of the problem. Discussed next steps for our towns with respect to clean up and restoration for residents and businesses. I worshipped with the good folks at Traveler's Rest Worship Center. God is in control."

As I sit before you today, I still believe that God is control, and he's trusting us to use the God given good sense to trust the science all around us that tells us these storms will worsen if we don't act. We have the tools if we will work together. We can.

I. INCREASINGLY SEVERE AND FREQUENT EXTREME WEATHER & NATURAL DISASTERS FUELED BY CLIMATE CHANGE

Climate Change is Leading to more Natural Disasters

The climate is changing at a rate unprecedented in the history of modern civilization. According to the 2018 National Climate Assessment (NCA), annual global temperatures have increased by 1.8 °F between 1901 and 2016, with most of this change (1.2 °F) occurring in the last 60 years. Sixteen of the last seventeen years have been the warmest on record – and this past July was the hottest month on the globe on record.

The impacts of global climate change are not something that will be experienced in a distant future; they are harming Americans across our nation as we speak. Climate change is leading to an increase in extreme weather events and natural disasters, the effects of which are already being felt, from intense heat waves, drought, and wildfires across the Western US, to devastating hurricanes and flooding along the Gulf Coast and Atlantic Coast. In 2015, California was in the fourth year of the most severe drought it had experienced in the last 165 years.[i] The land area burned by wildfires annually increased fourfold from 1985 to 2015, with more than 10.2 million acres burned nationwide in 2015.[ii] The 2017 Atlantic hurricane season tied the record for the most named storms, and the sustained intensity of these storms were unprecedented.

And the frequency and severity of these events is expected to continue increasing even more dramatically. According to a report by the Risky Business Project[iii], by mid-century, the average American will likely see 27 to 50 days over 95 °F each year, with those in the Southeast, Southwest, and upper Midwest likely to see several months over

95 °F. The annual area burned by wildfires is predicted to be 2-6 times higher than present by the same date.[iv] Sea level rise of 1-4 feet is expected by 2100, with a sea level rise exceeding 8 feet possible in high-emissions scenarios.[v] As extreme weather events increase in both intensity and frequency, so too will the number of Americans facing devastating damage and severe health threats in their everyday life.

Natural Disasters are Costly

Not only do natural disasters and extreme weather events pose a threat to human health and wellbeing, they are also incredibly costly. According to the NCA, over the last 40 years, the number of extreme weather-related events per year that cost more than $1 billion per event has continued to increase. In total, these extreme weather events have cost the United States over $1.1 trillion.[vi] Rising sea levels and intensified flooding will likely raise the cost of coastal storms by $2 to $3.5 billion, and when changes in hurricane activity are taken into account the annual cost of coastal storms is brought up to $35 billion.[vii] By 2055, between $66 billion and $106 billion worth of existing coastal property nationwide will likely be below sea level.[viii] The cost of fire suppression has increased consistently over the last 30 years, and this trend is likely to continue as wildfire frequency increases.[ix] Extreme heat threatens labor productivity, energy systems, and agriculture. By 2100, some states in the Southeast and Midwest risk a 50% - 70% loss in annual crop yields.[x]

The Southeast is Particularly Vulnerable

While the effects of climate change-driven extreme weather events are being felt across the United States, certain regions – specifically the Southeast – face especially severe impacts. Due to a variety of factors, cities in the Southeast are more vulnerable to climate change than cities in other regions.[xi] Sixty-one percent of major cities in the Southeast are experiencing worsening heat waves (the highest percentage in the country).[xii] High percentages of infrastructure in the region, particularly roads, bridges, urban drainage, and coastal property, are vulnerable to climate change; by 2050 the southeast is expected to have the most vulnerable bridges in the country.[xiii] Charleston, SC is expected to face 180 annual tidal floods by 2045, compared to 11 in 2014.[xiv] In South Florida, 590,000 people face extreme or high risk from sea level rise.[xv]

These exacerbated climate impacts lead to great economic challenges. Rising temperatures will likely lead to an increase in electricity demand as well as a decrease in energy system efficiency, translating to a 4% to 12% increase in energy costs, which has serious implications for industry in the area.[xvi] By 2050, $48.2 billion to $68.7 billion in existing coastal property in the Southeast will likely be below sea level. Average annual losses from storms in the region will likely increase by $3.6 to $6.8 billion.[xvii]

II. CITIES AND MAYORS ARE ON THE FRONT LINES

Experience as a Mayor – Costs hitting mayors harder than ever before for extreme weather events

Every year mayors are faced with increasing cost of floods, hurricanes, tornadoes and other climate crises. In 2011, my city was hit with over $600,000 in city assessed damages. (Damages to city streets, roads, and buildings.) This year, the city of Greenville is approaching $4,000,000.00 in damages as a result of this year's flooding.

Mayors and Cities Recognize the Importance of Resilience

For years, and as Tropical Storm Imelda confirmed last week, Houston has experienced unprecedented amounts of rainfall and devastating, repeated impacts on people and businesses. Imelda brought more than 40 inches of rain over three days to Southeast Texas. That is a 1-in-1,000-year rainfall event, just two years after Hurricane Harvey, also a 1-in-1,000-year event, set all kinds of records by dumping trillions of gallons of water on Houston over a few days.

In a city without zoning, those who live in the places with the most perils — near oil refineries or in floodplains — are mostly people of color and low wealth. Hurricane Harvey brought startling high levels of E. coli, lead and arsenic to the flooded living rooms of a public-housing project along Buffalo Bayou, putting an already vulnerable community at greater risk for long-term health problems.

The people of color on the city's heavily industrial east side carried a disproportionate burden for the extra air pollution released from petrochemical plants because of Harvey. The storms like Harvey cause spills, flaring and major emissions events as plants shut down abruptly and start up again. The people living nearby simply want their neighborhoods to be safe, healthy and affordable.

With climate change, there will likely be more intense storms, with higher wind speeds and more precipitation. As Houston and other cities plot a sustainable path forward, it must be a fair and just one, too.

In 2016, the National League of Cities; the U.S. Conference of Mayors; and 54 Cities, Counties, and Mayors across the country submitted a legal brief[xviii] to the D.C. Circuit, in defense of the Environmental Protection Agency's Clean Power Plan, that demonstrate that mayors and cities are working to address resiliency and adaptation issues in the face of extreme weather events and climate change. The brief included numerous examples of mayors and cities leading and recognizing resiliency challenges we are facing:

- p. 20: In 2013, **Baltimore** developed comprehensive responses—touching infrastructure, building codes, natural coastal barriers, and public services—to

threats from rising seas, heat waves, and storms. 27 City of Baltimore, Disaster Preparedness and Planning Project (Oct. 2013), bit.ly/1T3S0e3.

- p. 21: **Boulder County**'s 2012 Climate Change Preparedness Plan "focuses on four key sectors: water supply, emergency management[], public health, and agriculture and natural resources," and aims "to assist county and city departments that manage climate-sensitive resources and assets" by reorienting planning parameters to "the climate system of the future"—meaning a county beset by more, and more severe, floods, heat waves, droughts, wildfires, and vector-borne diseases. 31 Jason Vogel et al., Boulder County Climate Change Preparedness Plan (May 2012), bit.ly/1ZhBfg8.
- p. 21-22: **Dallas** has set out a list of objectives—relating to everything from transit to wastewater treatment—for improving air and water quality amid the growing stresses that a warming climate places on both. 33 City of Dallas, Sustainability Plan Progress Report (Mar. 2014), bit.ly/1SdolNa.
- p. 22-23: **Grand Rapids** has adopted a suite of measures—such as denser and greener development, and a halt to new road building—to respond to the warming temperatures and greater precipitation that threaten existing transportation infrastructure. 37 West Michigan Environmental Action Council, Grand Rapids Climate Resiliency Report (Dec. 2013), bit.ly/1XFZGSV.
- p. 25: **Pittsburgh**, which has lately seen colder winters, hotter summers, and more extreme precipitation and riverine floods, named a Chief Resilience Officer in June 2015 to coordinate, among other things, changes to the city's transportation networks that would make them more robust to extreme weather events. 46 Press Release, Mayor Peduto, Pittsburgh Sustainability Manager Grant Ervin Named Chief Resilience Officer, June 5, 2015, bit.ly/25gCbpi.
- p. 25: In 2014, **Portland**, Maine commissioned an investigation of what rising, warming, acidifying, and stormier seas would mean for its economy, which centers on port- and ocean-related industries like tourism, fishing, and marine services. 47 That investigation yielded a bevy of recommendations, ranging from practical near-term steps—protecting port facilities and energy and electricity infrastructure against storm surges—to longer-term ones—diversifying the port economy in anticipation of adverse climate change impacts on fisheries. 47 Waterfronts of Portland and South Portland Maine: Regional Strategies for Creating Resilient Waterfronts (May 11–16, 2014), 1.usa.gov/1Rvv9sy. 48 *Id*. at 16, 23–27.
- p. 26-27: **Salt Lake City's** Sustainable Code Revision Project, which has proceeded incrementally since 2009, amounts to a reweaving of city ordinances and policies with an eye to greater sustainability and resilience to climate change impacts.53 It builds in part on the city's examination of climate vulnerabilities and prioritization of issues such as water conservation and air quality maintenance. 53 Salt Lake City, Sustainable Code Revision Project, bit.ly/1SdJMOm (visited Mar. 21, 2016). 54 Salt Lake City, Sustainable Salt Lake – Plan 2015 (Dec. 2015), bit.ly/1UJBIab.

- p. 27: **Tucson**—no stranger to hot, dry weather—is working to respond to heat waves of unprecedented intensity and water supplies strained by recurrent drought and falling groundwater levels. 55 City of Tucson, Planning for Climate Change in the City of Tucson (Dec. 2012), bit.ly/1pY6hOp

Houston example of rebuilding for resiliency

III. REBUILDING FOR RESILIENCE

The NCA notes that "current infrastructure and building design standards do not take future climate trends into account," and that "investing in forward-looking design can help ensure that infrastructure performs acceptably under changing climate conditions."[xix] Extreme weather impacts from flooding, sea level rise, storm intensity, heat waves, and more threaten American cities and communities. Many cities, as illustrated above, are taking on these challenges in advance of and in the aftermath of extreme weather events and ensuring they are building and rebuilding for resiliency.

In Puerto Rico, after Hurricane Maria left thousands without power for a year, efforts continue to rebuild for resiliency. Communities, energy reform, technology and finance – all have a role to play in protecting the island from the next super storm, while improving the quality of life for all its residents and strengthening its economy long into the future. Projects are underway in Puerto Rico to deploy low-carbon microgrids, which can help keep the lights on during extreme weather events. Efforts to reform the energy system and planning are also a key to ensuring grid upgrades are done to ensure resiliency.

After restoring power to millions of New Yorkers in the wake of Superstorm Sandy, Governor Cuomo planted the seeds of overhauling the state's electric system, which led to the Reforming the Energy Vision (REV) initiative, an effort to build a cleaner, more reliable, resilient, and affordable grid. REV looks to create effective market mechanisms that lead to long-lasting solutions for utilities, customers, and a carbon-free environment. REV will help enable a distributed, smarter, and more resilient grid that can help ensure reliably power, including following extreme weather events. Indeed, areas like Coop City and Goldman Sachs were able to keep their lights on even as the grid failed during Hurricane Sandy, demonstrating the power of smart, clean, distributed power to ensure resiliency.

Around 41 million people, more than one-in-eight Americans, live in the nation's riverine and coastal floodplains, where critical energy, petrochemical refining, transportation, agriculture, and trade infrastructure is concentrated.[xx] The nation's coastal and inland waterways -- as gateways for agricultural, energy, and other exports -- produce $4.6 trillion in annual economic output. America's floodplains are vital to our country's economy, identity, and well-being.

Our coasts are exposed to some of the most damaging effects of climate change as rising sea levels encroach and more intense storms damage and even destroy businesses, homes, and families. Communities along our rivers are already experiencing more intense, damaging flooding. Confronting those challenges will require significant investment and shrewd policy. Flooding of riverine and coastal floodplains impacts virtually all corners of the U.S. and should be a pressing concern as legislators at the federal, state and local level consider solutions to climate change and the ways America must prepare to manage its impacts.

Floods are already the most common of natural disasters in the U.S. and as discussed above, increased impacts are expected in the future due to climate change. Adjusted for inflation, the five costliest hurricanes experienced by the U.S. have occurred since 2005, 4 of them since 2012. In 2017 alone, Hurricanes Harvey, Maria, and Irma cost an estimated $268 billion. That pattern is likely only to get worse. The unprecedented flooding in the Midwestern states experienced in Spring 2019 may soon become the new normal.

There are solutions at hand, however. We must begin to manage ahead of the floods by shifting federal, state and local policy from reactive to proactive and incorporating natural infrastructure into comprehensive strategies for managing water and coping better when flooding occurs. Doing so is common sense and will be economically beneficial to local communities, tax payers, and the federal purse. Based on history, it is estimated that $1 spent before a flood disaster saves $7 in property loss, business interruption, and death. Investing upfront will help mitigate the burden of catastrophic costs while better protecting entire communities and families from disaster fallout.

We must initiate solutions now. We can start by implementing community improvements such as resilient infrastructure, new zoning, and hazard informed-building codes to bring about both rapid and gradual changes needed to successfully cope with the realities that people face.

Pursuing natural infrastructure as a tool also can be effective as it can provide additional layers of protection that complement traditionally engineered structures, increasing security for businesses and families. Rather than allow coastal areas to fall prey to climate change, we should initiate proactive solutions that will allow coastal communities to flourish and safely weather any storms that may reach their shores in the future.

Communities rely greatly on federal funding to prepare for storms and mitigate risks as well as to offer support after disaster strikes. While disaster relief spending has become an annual debate in Congress, we can better protect vulnerable populations by taking active measures ahead of time, potentially lowering the costs of future weather events.

To adequately protect and bolster coastal and riparian communities, Congress should consider taking actions such as:

- Fund and engage communities in proactive, hazard-informed planning that builds consensus on acceptable risks, teaches communities how to cope with water, and secures rapid implementation
- Support data acquisition and modeling such as ocean, coastal and stream gauges to provide better information for better planning and management
- Invest in approaches that value and use natural infrastructure to complement traditional approaches to reduce flood hazard and vulnerability and maximize ecosystem and damage reduction benefits and sustainability
- Improve coordination and alignment of federal and state goals and actions for coastal regions to advance implementation of comprehensive plans that include natural infrastructure to meet the urgency of the need
- Increase pre-disaster funding for critical agencies such as FEMA and HUD

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[i] Zamuda et al, 2018: Energy Supply, Delivery, and Demand. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*. U.S. Global Change Research Program, Washington, DC, USA, pp. 174–201. https://nca2018.globalchange.gov/chapter/4/

[ii] Vose et al, 2018: Forests. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*. U.S. Global Change Research Program, Washington, DC, USA, pp. 232–267. https://nca2018.globalchange.gov/chapter/6/

[iii] An initiative founded by NYC Mayor Michael Bloomberg, former U.S. Secretary of the Treasury Hank Paulson, and business leader Tom Steyer to assess the economic risks to the US posed by climate change. https://riskybusiness.org/

[iviv] Vose et al, 2018: Forests. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*. U.S. Global Change Research Program, Washington, DC, USA, pp. 232–267. https://nca2018.globalchange.gov/chapter/6/

[v] Hayhoe et al, 2018: Our Changing Climate. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*. U.S. Global Change Research Program, Washington, DC, USA, pp. 72–144. https://nca2018.globalchange.gov/chapter/2/

[vi] Ibid.

[vii] *The Economic Risks of Climate Change in the United States: A Climate Risk Assessment for the United States*. June 2014. Risky Business. https://riskybusiness.org/report/national/

[viii] Ibid.

[ix] Vose et al, 2018: Forests. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*. U.S. Global Change Research Program, Washington, DC, USA, pp. 232–267. https://nca2018.globalchange.gov/chapter/6/

[x] *The Economic Risks of Climate Change in the United States: A Climate Risk Assessment for the United States*. June 2014. Risky Business. https://riskybusiness.org/report/national/

[xi] Carter et al, 2018: Southeast. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*. U.S. Global Change Research Program, Washington, DC, USA, pp. 743–808. https://nca2018.globalchange.gov/chapter/19/

[xii] Ibid.

[xiii] Ibid.

[xiv] Ibid.

[xv] Ibid.

[xvi] *Come Heat and High Water: Climate Risk in the Southeastern U.S. and Texas*. July 2015. Risky Business. https://riskybusiness.org/report/come-heat-and-high-water-climate-risk-in-the-southeastern-u-s-and-texas/

[xvii] Ibid.

[xviii] Brief of *Amici Curiae* the National League of Cities; the U.S. Conference of Mayors; and 54 Cities, Counties, and Mayors in Support of the U.S. Environmental Protection Agency," *West Virginia v. U.S. Envtl. Prot. Agency*, No. 15-1363 (D.C. Cir.) (April 1, 2016).

[xix] Maxwell et al, 2018: Built Environment, Urban Systems, and Cities. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*. U.S. Global Change Research Program, Washington, DC, USA, pp. 438–478. https://nca2018.globalchange.gov/chapter/11/

[xx] Wing et al. 2018, Estimates of present and future flood risk in the conterminous United States. Environmental Research Letters 13:3 https://iopscience.iop.org/article/10.1088/1748-9326/aaac65