

# Failing to Address Climate Change Threatens the Economy

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**JOINT ECONOMIC COMMITTEE**  
**DEMOCRATS** U.S. Senator Martin Heinrich  
Ranking Member

## **Failing to Address Climate Change Threatens the Economy**

Global temperatures are rising, and without drastic and immediate action, they will continue to rise substantially and cause significant economic harm. That is the conclusion of recent reports from the United Nations' Intergovernmental Panel on Climate Change (IPCC) and the U.S. Global Change Research Program's National Climate Assessment.<sup>1</sup> As the earth warms, sea levels will rise, health outcomes will get worse, agriculture yields will decline, and extreme weather disasters will become more severe and more frequent.

These changes will cost lives, force waves of human migration across the globe, upend insurance markets, and have dire consequences for the American economy. The Federal Reserve Bank of Richmond projects that climate change could reduce annual economic growth in the United States by one third over the next century.<sup>2</sup> Researchers from the University of California estimate that U.S. Gross Domestic Product (GDP) will decline by 1.2 percent for every degree of additional warming—for context, 1.2 percent of GDP in 2017 was \$233 billion, about the size of the Louisiana economy.<sup>3</sup> The most recent National Climate Assessment concluded that if emissions continue to grow at current rates, the annual losses to the U.S. economy will be hundreds of billions of dollars by the end of the century.<sup>4</sup>

Too much time is spent debating whether climate change is real, or humans' role in climate change. The science is clear on both of these points – climate change is a major threat to families and workers across the globe. Congress must stop kicking the can down the road and instead start taking action to mitigate the worst economic damages of climate change. The extreme weather disasters of recent years are just the beginning, and Congress is leaving American families woefully unprepared.

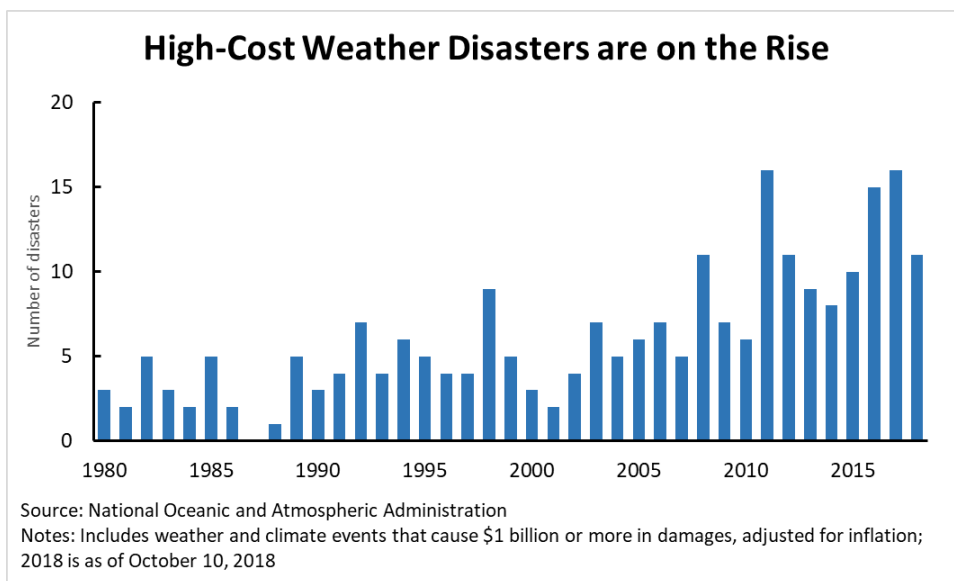
### **The Rise in Extreme Weather Disasters**

One already visible consequence of climate change is the increase in frequency, intensity, and cost of severe weather events. The National Oceanic and Atmospheric Administration (NOAA) tracks weather and climate events that cause more than \$1 billion in economic damage (adjusting past events for inflation). These events include hurricanes, droughts, floods, wildfires, and other storms and temperature extremes.

In the 1980s, there were 28 such events, causing \$169 billion in total damages. In the 1990s, there were 51 events causing \$263 billion in damages. In the 2000s, 57 major disasters caused \$497 billion in damage. From 2010 to today, there have been more than 100 high-cost weather disasters totaling more than \$662 billion in losses. The highest year on record was 2017, with more than \$300 billion in damages.<sup>5</sup>

With these disasters, homes and businesses are damaged and destroyed, local and regional economies are disrupted, and, most importantly, lives are lost. This month alone, raging wildfires in California have become the deadliest in state history, killing 44 people and leaving hundreds more unaccounted for.<sup>6</sup> The death toll of Hurricane Maria is estimated at 2,975.<sup>7</sup>

Climate experts have unambiguously linked the rise in the frequency and severity of these events to warming temperatures.



### Threats to Household Wealth and Property

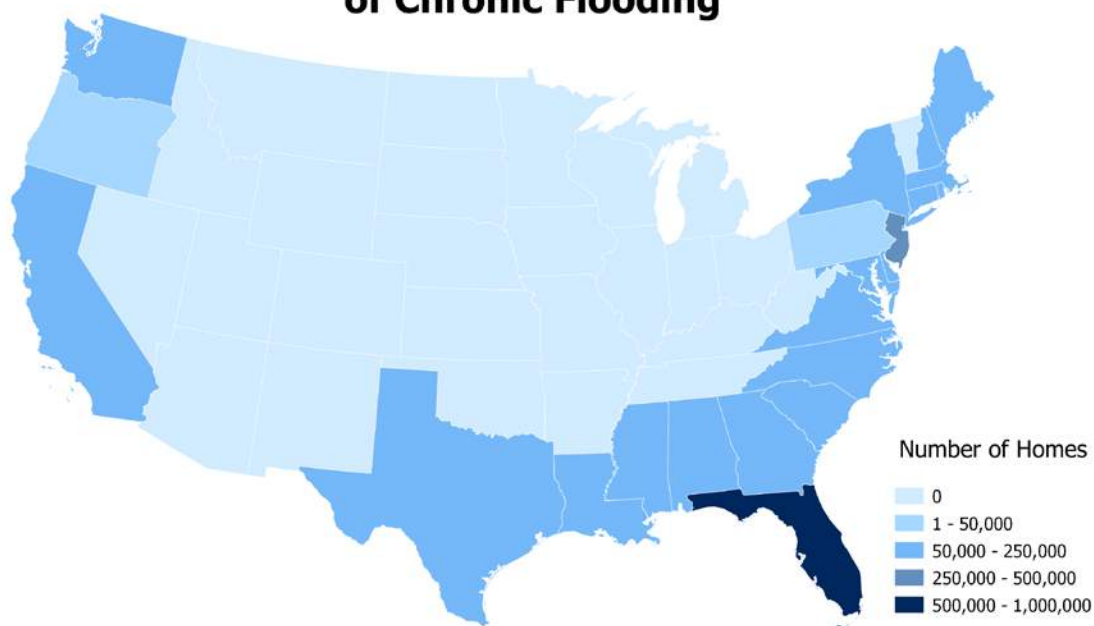
Rising sea levels and increased frequency of disasters will have enormous consequences for homeowners and businesses in affected regions. Rising sea levels will increase chronic tidal flooding – experiencing an average of 26 floods annually – in coastal neighborhoods. This flooding will cause damages and hurt property values. The Union of Concerned Scientists analyzed property listings to identify 311,000 homes and 14,000 commercial properties that will be at increased risk of chronic tidal flooding over the next 30 years. Within the next century, more than \$1 trillion in homes and commercial properties will be at increased risk of chronic tidal flooding because of climate change.<sup>8</sup>

Property values in coastal communities are likely already being affected. While many of these regions are still seeing property values increase alongside the national market, recent research shows that exposure to potential sea level rises is leading to lower property value appreciation. Exposed homes sell for 7 percent less than comparable homes that are not exposed to rising sea levels, even after accounting for the distance to beaches.<sup>9</sup> For homeowners whose wealth is mostly in home equity, a 7 percent hit to a home’s value can be devastating. For example, the average home in Florida is about \$228,000 – a 7 percent loss in value would be nearly \$16,000.<sup>10</sup> Losing this wealth would be the equivalent of losing a year’s worth of social security benefits for the average retiree.<sup>11</sup>

## Uncertainty in Insurance Markets

Extreme weather brings costly damages to homeowners and business proprietors. Afterwards, these Americans are often reliant on insurance policies to make them whole – or if they are uninsured, the government often steps in to partially mitigate the loss. But where and how climate change will strike is greatly uncertain, and it is not clear that risk models can keep up.

### Coastal Homes At Increased Risk of Chronic Flooding



Source: Union of Concerned Scientists, 2018.  
Note: Analysis is of coastal states of the contiguous U.S. Map shows homes with increased risk of chronic tidal flooding by 2100. Estimates are from the high sea level rise scenario in report.

As the environment becomes less predictable, it is more likely that insurers will find that they mispriced risk and the associated premiums.<sup>12</sup> Where insurers do correctly price in climate change, premiums are likely to rise for consumers.<sup>13</sup>

For instance, the models and maps that use past floods to drive designation of flood zones, setting of premiums by insurance companies, and decisions of where to build or rebuild are proving increasingly inadequate for providing a realistic roadmap of risks. When a once-in-500-year flood hits three times in three years, as happened in the Houston area, it's clear that our measures of flood risk have become outdated. Equally telling, about two-thirds of the homes damaged during Hurricane Harvey were outside the 100-year floodplain.<sup>14</sup>

Catastrophic weather events are more often hitting uninsured properties as well. The amount of annual catastrophic weather related damages that are not covered by insurance has increased by 50 percent globally since 2004.<sup>15</sup> This increase makes it more difficult for families and businesses to rebuild after disasters. For example, only 50 percent of homes in Puerto Rico

were covered against wind damage prior to Hurricane Maria.<sup>16</sup> Further, less than 4 percent had flood insurance. This left homeowners without the money needed to rebuild and instead waiting to be approved for Federal Emergency Management Agency (FEMA) aid.<sup>17</sup>

Having insurance against extreme weather is no guarantee that homeowners and individuals will be fully made whole after disasters. After Superstorm Sandy hit New Jersey and New York, hundreds of homeowners reported receiving payouts that were lower than their coverage limits and insufficient to rebuild.<sup>18</sup> And, a year after Hurricane Maria, there are still thousands of pending insurance claims yet to be settled.<sup>19</sup>

Individuals and communities can suffer dire and lasting consequences when relief efforts are delayed or insufficient. One year after Hurricane Harvey, for example, thousands of children remained stranded in shelters, motels, campgrounds, and cars while their homes remained in disrepair, resulting in a significant emotional and educational toll for these students.<sup>20</sup> The slow recovery from Maria provides another example of the disruption caused by insufficient responses to damages – 42 percent of residents reported experiencing a negative employment or income effect from the storm, and 44 percent have experienced a power outage lasting more than 3 months.<sup>21</sup>

### **Climate Change will have Disparate Impacts**

Climate change will not impact everyone or all parts of the country equally. Regionally, areas where temperatures are already warm, such as the South and Southwest, will suffer the harshest effects of rising temperatures. Crop yields will be negatively affected and humans will be forced to deal with the growing health consequences of extreme heat.<sup>22</sup> Coastal areas will be hardest hit by rising sea levels, experiencing more chronic flooding and more hurricanes.<sup>23</sup>

Not all industries will be impacted equally. Sectors that rely on outdoor manual labor, like construction, will see declines in productivity in areas that have more frequent extreme heat waves. The agriculture sector will have to adjust to new growing seasons and weather patterns. The real estate industry will be hit along with coastal property values. Wholesale and retail trade rely heavily on laborers to load and unload goods in areas that are typically not climate-controlled, exposing those industries to the effects of rising temperatures as well.<sup>24</sup>

Climate change will also adversely affect the health and well-being of communities of color, the poor, and the most vulnerable among our society. Increases in air pollution, frequency of extreme weather events and temperatures due to climate change stand to hurt poor communities and some communities of color the most, many of whom already experience higher than average exposure to unhealthy environments.<sup>25</sup> Children and the elderly are more susceptible to suffer from the infectious diseases, air pollution, heat waves, and mental health trauma resulting from extreme weather changes.<sup>26</sup>

## Climate Change in the Southwest United States

While the most visible severe weather events in recent years have been strong hurricanes in the Atlantic Ocean and the Gulf of Mexico and wildfires in the Western United States, the effects from climate change extend well beyond these catastrophic events. The Southwest, for example, faces a myriad of challenges from climate change.

Temperatures are projected to increase in the Southwest by 5.5 to 9.5 degrees Fahrenheit by 2070 - 2099.<sup>27</sup> Higher temperatures along with reduced snowpack and declining river flows result in decreased water supplies, with the impacts expected to increase after 2050. The reduced water supplies affect agriculture as well as drinking water in urban areas.<sup>28</sup>

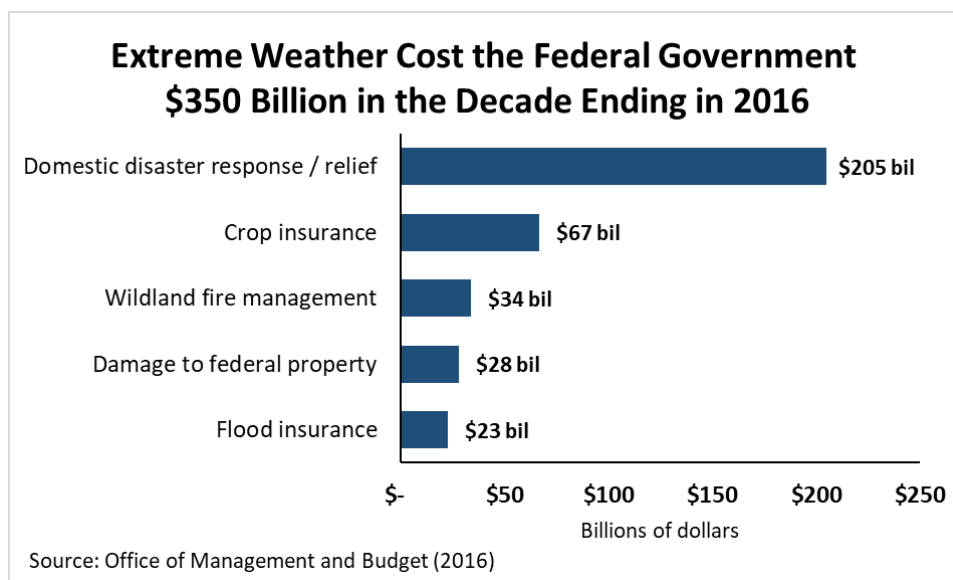
As intense heat and droughts become more frequent, the frost-free season has increased in the region with notable adverse effects on crops. Many nut- and fruit-bearing trees in the Southwest require lengthy winter chill periods that will be shortened as a result of the changing climate. Extreme temperatures also reduce yields for fruit trees, corn, and other products.

Increased warming and more frequent droughts increase wildfire risks. For example, in mid-elevation conifer forests in the Western United States, the combination of higher temperatures, earlier snowmelt and longer summers increased fire frequency by 400 percent and burned areas by 650 percent from 1970 to 2013. Nearly one million homes in California, Colorado and Texas are at risk or high-risk of wildfire, and that figure is projected to grow.<sup>29</sup> A monster drought is also a growing risk. One study finds that without action to dramatically lower emissions, the Southwest faces a 70 to 99 percent chance of a 35 plus year drought this century.<sup>30</sup>

With more frequent, more intense wildfires and rivers and lakes drying up in the Southwest, outdoor recreation, which contributes \$887 billion annually to GDP and supports 7.6 million jobs nationally, will take a hit.<sup>31</sup> The Four Corners states, just by themselves, account for more than \$70 billion in outdoor recreation spending.<sup>32</sup> But extreme heat and water shortages threaten outdoor recreation. Low rivers levels will affect activities from kayaking and rafting to fishing and swimming. Yosemite National Park in California closed for 20 days due to wildfires this past summer, leading thousands of tourists to cancel visits, resulting in revenue losses for local stores and restaurants.<sup>33</sup> But devastating wildfires are no longer isolated or rare events.<sup>34</sup>

## Cost to the Federal Government

The federal government is not immune to the costs of climate change. The Office of Management and Budget (OMB) estimated in 2017 that climate change cost the federal government more than \$350 billion in the prior decade. This cost includes spending on federal responses to more frequent disasters, higher costs of crop and flood insurance programs, wildland fire management, and maintenance and repairs to federal land, infrastructure, and facilities.<sup>35</sup>



Recent hurricanes show how expensive the response can be. Congress provided \$110 billion following Hurricane Katrina in 2005, \$54 billion after Sandy hit in 2012 and \$136 billion following the natural disasters in 2017.<sup>36</sup> Most of these funds go to rebuilding public infrastructure. Two trends are causing federal spending on disasters to rise. First, disasters are causing more damage as they become more extreme. From 1980 to Katrina, the average major hurricane caused about \$9 billion in damage. Since Katrina, the average damage has been almost \$44 billion.<sup>37</sup> The second trend is that the federal government is taking on a higher share of the damage. Pre-Katrina, federal spending on disaster relief covered about 17 percent of the economic damage on average. Since Katrina, the federal government has covered an average of 62 percent of the damage.<sup>38</sup>

As these disasters continue to increase in frequency and severity, so too will the costs of responding to them. An analysis by the OMB projects that climate change could increase the average annual expenditures on hurricane relief by \$50 billion by 2075.<sup>39</sup>

There are indirect costs of climate change to the public sector as well. Rising temperatures will lead to worse health outcomes for Americans. For the 122 million Americans that receive publicly-funded health care, costs will rise more than they would without climate change.<sup>40</sup>

Rising temperatures will also be associated with higher crimes in many parts of the country, as inclement cold weather is associated with lower levels of crime.<sup>41</sup> With higher levels of crime will come increased public sector costs of combating crime and prosecuting criminals.

### Looking Forward

Climate change is one of the greatest global threats of the 21<sup>st</sup> century. Rising temperatures and sea levels will cause massive disruption to both human life and our economy. The United States must take strong leadership now to help mitigate the worst effects – every year we delay makes the problem more difficult to address.

Further, addressing climate change is not a choice between the environment and the economy, as Republicans often claim. In the long-run, failing to mitigate climate change will have dire economic consequences. Working to build the clean energy sector also has the potential to actually create economic opportunity and fully transitioning to zero-carbon energy could create millions of jobs.<sup>42</sup>



### Impact of Climate Change by State

	Extreme Weather Events		Temperature Rise	Crop Yields	Jobs in High-Risk Industries	Electricity Demand
	Number of Events Causing More Than \$1 Billion in Economic Loss		Rise in Avg. Summer Temperature in Degrees Fahrenheit	Percent Change in Yields	Percent Change in Supply of Jobs	Percent Change in Retail Electricity Sales
	1990s	2007-2016	1981-2010 vs. 2080-2099	2080-2099	2080-2099	2080-2099
Alabama	9	23	8.4	-11.9%	-1.9%	12.2%
Alaska	0	3	8.43	N/A	-0.3%	#N/A
Arizona	6	23	9.4	-35.8%	-1.9%	14.4%
Arkansas	1	12	8.85	-37.1%	-1.7%	16.4%
California	6	14	8.02	0.3%	-1.0%	6.8%
Colorado	4	22	9.48	15.6%	-1.3%	4.3%
Connecticut	3	9	9.19	N/A	-0.8%	2.3%
Delaware	1	7	8.95	-22.7%	-1.2%	8.8%
Florida	10	10	6.85	7.2%	-2.2%	13.3%
Georgia	9	27	8.08	-11.6%	-1.8%	10.5%
Hawaii	1	0	5.21	N/A	-1.7%	16.2%
Idaho	4	21	10.44	-28.8%	-1.5%	9.0%
Illinois	2	13	10.71	24.3%	-1.3%	5.1%
Indiana	6	30	10.09	-37.9%	-1.3%	10.4%
Iowa	5	23	9.71	-29.0%	-1.4%	10.7%
Kansas	7	33	10.31	-2.1%	-1.6%	11.6%
Kentucky	5	22	9.53	-43.3%	-1.7%	12.3%
Louisiana	9	16	7.94	-37.7%	-2.0%	13.8%
Maine	4	6	9.16	N/A	-0.8%	1.9%
Maryland	5	19	9.11	-23.8%	-1.4%	8.9%
Massachusetts	2	2	9.53	N/A	-0.7%	0.9%
Michigan	2	12	9.77	-1.6%	-1.2%	7.5%
Minnesota	6	12	10.88	-9.7%	-1.3%	7.3%
Mississippi	6	29	10.15	-39.1%	-1.7%	11.9%
Missouri	8	20	8.76	-37.2%	-2.1%	12.7%
Montana	2	11	10.92	31.5%	-1.0%	1.9%
Nebraska	13	23	8.1	-10.7%	-1.5%	9.9%
Nevada	2	5	10.87	18.9%	-1.3%	6.2%
New Hampshire	3	16	10.51	-35.2%	-1.6%	9.5%
New Jersey	3	4	9.46	N/A	-0.9%	1.2%
New Mexico	4	15	9.16	-14.4%	-1.1%	8.0%
New York	2	13	9.12	13.7%	-1.8%	9.1%
North Carolina	2	10	9.95	32.1%	-1.4%	13.0%
North Dakota	5	19	9.9	-5.7%	-0.9%	6.9%
Ohio	7	18	10	-16.4%	-1.3%	9.9%
Oklahoma	9	35	9.42	17.4%	-1.8%	14.0%
Oregon	4	12	10.04	31.9%	-0.5%	0.2%
Pennsylvania	7	23	9.95	-23.2%	-1.2%	7.6%
Rhode Island	3	5	8.44	N/A	-0.6%	1.7%
South Carolina	10	18	7.81	-19.6%	-1.7%	10.7%
South Dakota	4	8	11.2	-11.8%	-1.3%	7.7%
Tennessee	8	26	9.06	-30.2%	-1.8%	12.3%
Texas	13	48	8.35	-6.4%	-2.2%	15.3%
Utah	1	7	9.73	19.3%	-1.7%	9.1%
Vermont	7	22	8.97	-21.4%	-1.4%	9.1%
Virginia	3	3	9.68	N/A	-0.9%	0.8%
Washington	4	10	10.11	31.3%	-0.3%	-0.1%
Washington D.C.	#N/A	#N/A	9.2	N/A	-1.6%	9.7%
West Virginia	2	13	10.12	-9.8%	-1.0%	6.6%
Wisconsin	5	7	9.59	-31.0%	-1.3%	8.6%
Wyoming	0	10	10.2	18.0%	-1.2%	2.7%

Source: Sources: The Universal Ecological Fund; Climate Impact Lab - American Climate Prospectus

Notes: Projections reflect median forecasted values based on a high-emissions scenario. Crop yield, supply of jobs, and retail electricity sales is change from baseline of 2012. Crop yield is percent difference in yield of cotton, oilseed, wheat, and maize related to scenario without climate change. Jobs at risk is total supply of jobs in manufacturing, agriculture, construction, and utilities relative to scenario without climate change.

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