

Are major natural disasters on the rise due to climate change?

The frequency and cost of billion-dollar natural disasters are increasing nationwide.

Updated on Tue, March 28, 2023 by USAFacts Team

The number of natural disasters that cost over a billion dollars has increased over the last forty years, rising from an average of three per year in the 1980s to 13 per year during the 2010s. Not only are natural disasters occurring more frequently, but the average cost and death toll from each is up as well.

The National Centers for Environmental Information has kept track of billion-dollar natural disasters since 1980, citing climate change as a critical reason for the increase.

Over the past several decades, the increase in natural disaster declarations has led to the federal government spending more money on disaster relief.

Are billion-dollar natural disasters becoming more frequent?

Eight out of the 10 years with the highest number of natural disasters occurred in the last decade.

Since 1980, there have been 332 billion-dollar natural disasters in the US. In total, these disasters have cost \$2.2 trillion after adjusting for inflation and took the lives of more than 15,000 people. This includes 160 severe storms, 57 tropical cyclones or hurricanes, 36 floods, 30 droughts, 20 wildfires, 20 winter storms, and nine freezes.^[1]

In the 1980s, there were a total of 31 billion-dollar natural disaster events, resulting in 2,970 deaths. In the 2010s, this number rose to 128 such events, resulting in 5,227 deaths.

About 43% of billion-dollar natural disaster events have occurred in the last decade alone.

Frequency of billion-dollar natural disasters, 1980-2022



	Severe Storm Count	Tropical Cyclone Count	Flooding Count	Drought Count	Wildfire Count	Winter Storm Count	Freeze Count	
1980	1	1	1					
1981	1	1						
1982	2		1					
1983	1	2		1	1			
1984	2							
1985	1	3			1	1	1	
1986	1	1						
1987								
1988	1							
1989	1	2			1	1	1	
1990	1	1	1	1				
1991	1	1	1	1				
1992	4				2		1	
1993	1	1	1	1	1			
1994	1	1	1	1	2			
1995	2	3			1	1		
1996	1	1	1	1				
1997	1	2						
1998	3		3		1	1	1	1
1999	1	1	1	2				
2000	1	1	1	1	1			
2001	2	1						
2002	2	2		1	1			
2003	4		1	1	1			
2004	2	4						
2005	1	4			1			
2006	5		1	1	1			
2007	1	1	1	2				
2008	6		3		1	1	1	
2009	6		1	1	1			
2010	4		2	1				
2011	10			2	2	1	1	2
2012	7		2	1	1			
2013	7		2	1				
2014	6		1	1	1			

201: 6	2	1	1	1					
201: 8		1	4			1	1		
201: 10				3		2		1	1
201: 9			2		1	1	2		
201: 8		2		3		1			
202: 13						7			1
202: 11					4		2	1	1
202: 8			1						

Flooding and severe storm events have increased the most in recent years compared with all types of natural disasters. About 45% of all flooding disasters tracked by the National Centers for Environmental Information and 54% of severe storm events occurred between 2013 and 2022.

More than a quarter of all billion-dollar storm events occurred in the last five years (2017-2021). The average number of billion-dollar natural disasters per year during this period grew from about three per year in the 1980s to about 18 a year from 2017 to 2021.

During the first six months of 2022, there were nine billion-dollar weather and climate disaster events. These include two tornado outbreaks, three severe weather events, two hailstorms, a derecho^[2], and a regional drought.

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How are disaster costs calculated?

The National Oceanic and Atmospheric Administration is responsible for calculating the costs of individual natural disasters. There are three main categories of direct or indirect costs that go into these estimates. These include physical damage to homes, businesses and government buildings, damage to property inside these buildings, and the costs associated with businesses being shut down or people losing their homes.

The cost estimates don't include environmental damages, any physical or mental healthcare costs, or larger supply chain impacts. The government also doesn't attempt to put a price tag on the lives lost during a disaster.

Because of the way disaster costs are calculated, the estimated totals are **considered conservative evaluations**. The true costs associated with natural disasters are difficult to capture due to the lack of immediate data and the hard-to-measure long-term costs.

Which types of natural disasters are the costliest?

Tropical cyclones or hurricanes are the costliest natural disasters in terms of both total costs and total loss of human life. At approximately \$1.2 trillion in inflation-adjusted dollars, tropical cyclones or hurricanes account for just over half of all costs associated with billion-dollar natural disasters since 1980. About 33% of all hurricanes or cyclones since 1980 occurred in the last five years (2017-2021). These events amounted to a total cost of \$512.5 billion, or just under half of all costs associated with tropical cyclones or hurricanes.

Droughts (\$300.1 billion), severe storms (\$365.3 billion), and floods (\$173.7 billion) have also caused considerable damage. Winter storms (\$83.3 billion) and freezes (\$34.5 billion) were the least costly natural disasters.

Tropical cyclones or hurricanes are also responsible for the highest number of deaths (6,708), followed by drought or heatwave events (4,139) and severe storms (1,980). Deaths associated with severe storms, tropical cyclones, and wildfires have all increased in recent years. Meanwhile, deaths from droughts and winter freeze events have decreased since the 1980s.

Over that time, deaths from freezes and wildfires accounted for the lowest percentage of deaths caused by natural disasters.

There have been 338 billion-dollar natural disasters since 1980.

A list of every billion-dollar disaster since 1980, provided by NCEI data.



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Name	Disaster Type	Begin Date ▼	End Date	Total CPI-Adjusted Cost (2022 dollars)	Deaths
Hurricane Ian	Tropical Cyclone	Sep 28, 2022	September 30, 2022	TBD	131
Hurricane Fiona	Tropical Cyclone	Sep 17, 2022	September 18, 2022	TBD	25
Kentucky and Missouri Flooding	Flooding	Jul 26, 2022	July 28, 2022	\$1,195,000,000	42
North Central and Eastern Severe Weather	Severe Storm	Jul 22, 2022	July 24, 2022	\$1,294,000,000	1
Central Derecho	Severe Storm	Jun 13, 2022	June 13, 2022	\$2,936,000,000	1
Central Severe Weather	Severe Storm	Jun 7, 2022	June 8, 2022	\$1,837,000,000	0
North Central Hail Storms	Severe Storm	May 19, 2022	May 19, 2022	\$1,839,000,000	0
North Central Severe Weather	Severe Storm	May 11, 2022	May 12, 2022	\$2,588,700,000	1
North Central Hail Storms	Severe Storm	May 9, 2022	May 9, 2022	\$1,929,100,000	0
Southern and Central Severe Weather	Severe Storm	May 1, 2022	May 3, 2022	\$1,139,000,000	1
Southern Severe Weather	Severe Storm	Apr 11, 2022	April 13, 2022	\$2,677,700,000	1
Southeastern Tornado Outbreak	Severe Storm	Apr 4, 2022	April 6, 2022	\$1,409,300,000	3

Western Wildfires	Wildfire	Apr 1, 2022	September 30, 2022	TBD	17
Southern Tornado Outbreak	Severe Storm	Mar 30, 2022	March 30, 2022	\$1,281,100,000	2
Western/Southern Plains Drought and Heat Wave	Drought	Jan 1, 2022	September 30, 2022	\$9,326,700,000	117
Midwest Derecho and Tornado Outbreak	Severe Storm	Dec 15, 2021	December 15, 2021	\$1,871,300,000	1
Southeast Central Tornado Outbreak	Severe Storm	Dec 10, 2021	December 10, 2021	\$4,110,900,000	93
Hurricane Nicholas	Tropical Cyclone	Sep 14, 2021	September 18, 2021	\$1,087,200,000	0
Hurricane Ida	Tropical Cyclone	Aug 29, 2021	September 1, 2021	\$78,722,300,000	96
Tropical Storm Fred	Tropical Cyclone	Aug 16, 2021	August 18, 2021	\$1,366,600,000	7
North Central Severe Weather	Severe Storm	Aug 10, 2021	August 13, 2021	\$1,374,100,000	2

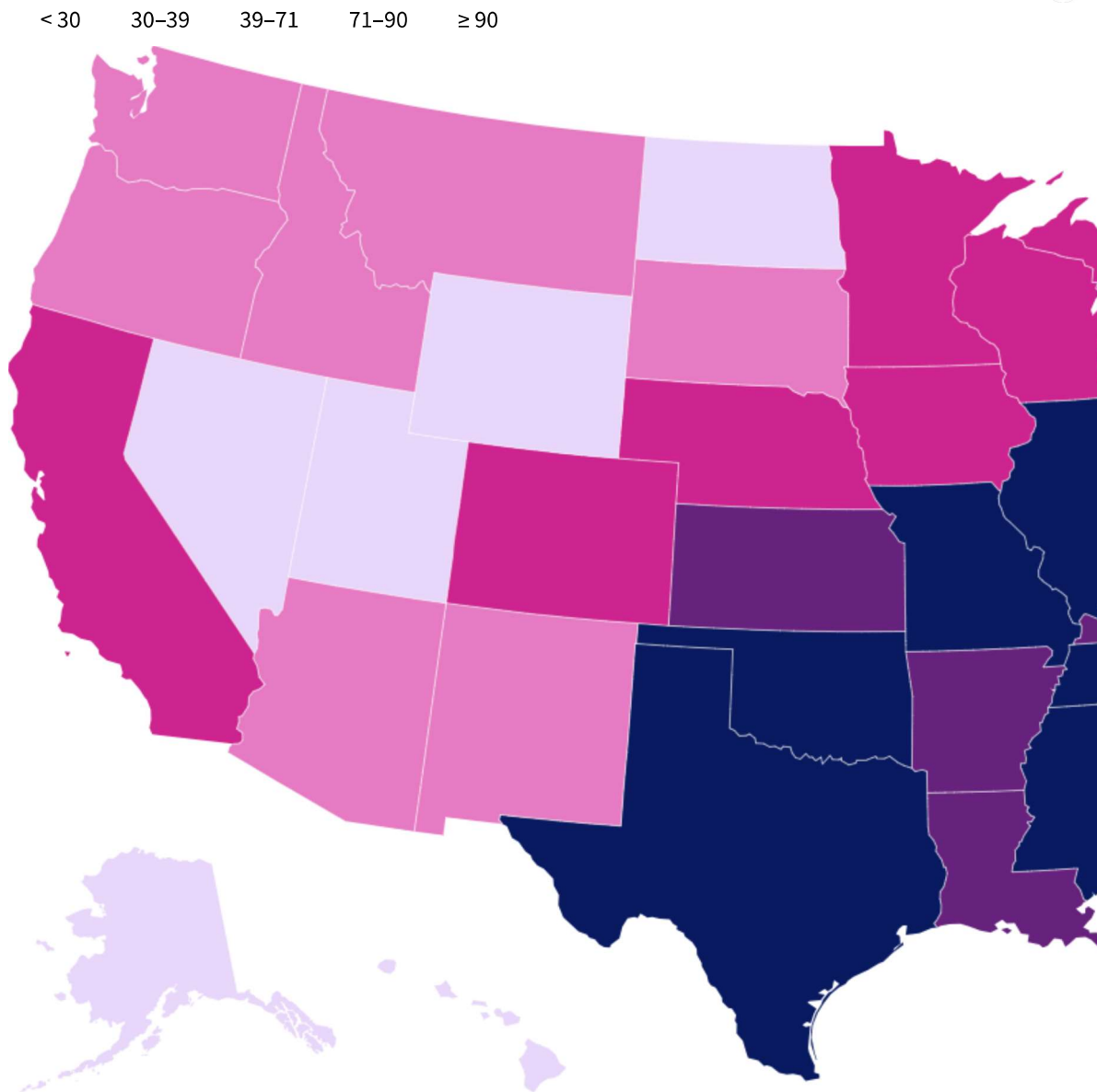
Which states are most affected by natural disasters?

Each geographic region of the US faces a unique combination of weather and climate hazards. Historically, the South and Midwest regions have experienced the highest frequency and highest costs from billion-dollar disaster events. According to the National Centers for Environmental Information, the frequency and cost of billion-dollar disasters are expected to continue rising across the US due to the impact of climate change.

Texas has the highest rate of billion-dollar disasters at 149 total events, or approximately 3.5 disasters per year.^[3] Other states in the South and Midwest regions, including Illinois, Georgia, Alabama, and North Carolina, had among the highest rates of natural disasters per year. The majority of these disasters in these states were severe storms.

Southern and Midwestern states experience the highest number of billion-dollar natural disasters.

Total number of billion-dollar natural disasters by state, 1980-2022.



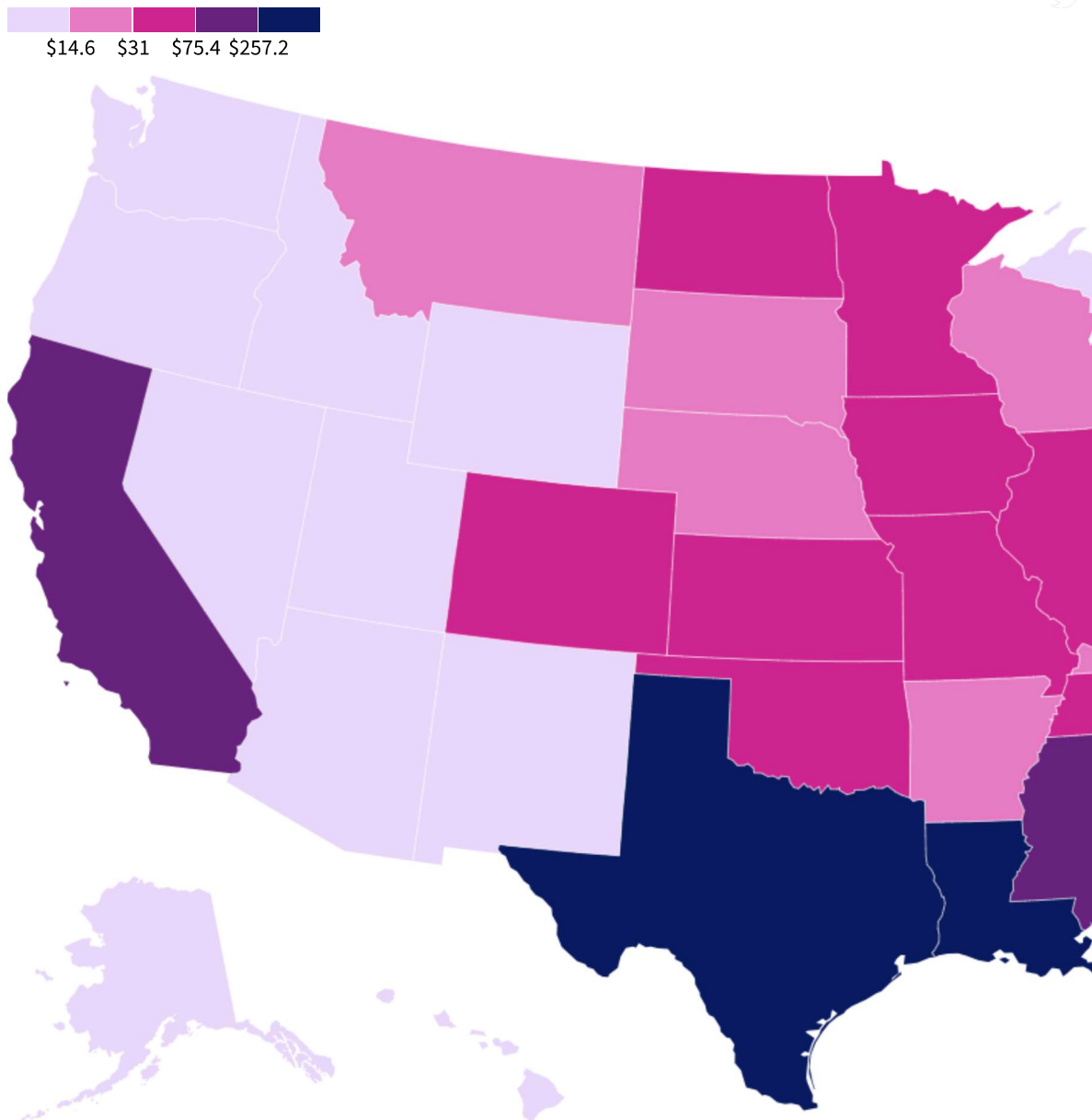
Data on billion-dollar natural disasters not available for the District of Columbia. Adjusted for inflation in 2022 dollars.

Similarly, states in the South experienced the highest costs associated with billion-dollar disasters. Texas, Florida, and Louisiana had the highest natural disaster-related costs, each surpassing \$250 billion since 1980. These costs primarily result from recent tropical cyclones, hurricanes, or severe storms along the Gulf Coast.

States in New England had the lowest costs associated with billion-dollar disasters, most of which also came from severe storms or hurricanes.

Billion-dollar natural disasters from Texas, Louisiana, and Florida totaled more than \$900 billion.

Total cost from billion-dollar natural disasters by state in billions, 1980-2022



Data on billion-dollar natural disasters not available for the District of Columbia. Adjusted for inflation in 2022 dollars.

How are disaster relief efforts funded?

Funding for natural disasters is managed at the local, state, and federal levels. Local governments are the first line of defense against natural disasters and are expected to manage the immediate impacts of emergencies. However, depending on the severity of the disaster, a local government's capacity to handle the incident may be limited. Statewide disaster funding and federal grants are often required to handle the immediate expenses resulting from natural disasters.



Natural disaster budgeting strategies can vary greatly at the state level. The two most common preemptive budgetary strategies are statewide disaster accounts and reserve funds, also known as rainy day funds.^[4]

Statewide disaster accounts are specialized funds that provide money to counties, cities, and towns for disaster costs. Typically, these accounts are funded through the state's general revenue fund, but can also come from specific sources, such as oil and gas taxes. The appropriation of these funds takes place at the beginning of the fiscal year and takes into account historical disaster costs and forward-looking risk assessments.

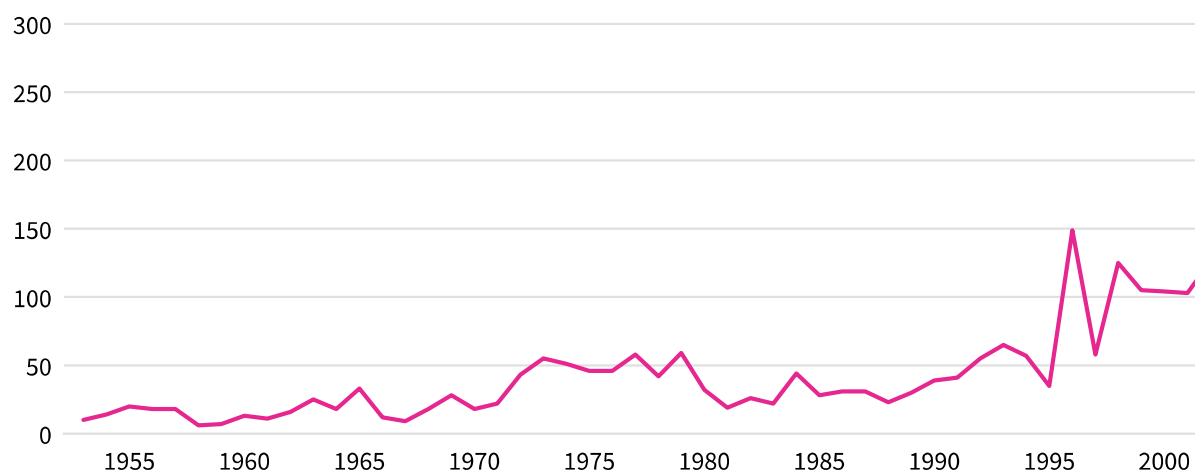
Reserves or rainy-day funds help cushion the blow of economic downturns or other unforeseen circumstances impacting state revenues. Typically, these funds are reserved for a variety of unforeseen circumstances rather than exclusively for natural disasters.

As of 2018, 46 states had statewide disaster accounts, while 35 states had reserve funds.

When the cost of natural disasters exceeds the state's capacity to respond to the incident, the governor of the affected state may file for assistance to the president. If this appeal succeeds, the president may enact a presidentially declared disaster, which authorizes federal government assistance.

The frequency of disaster declarations has risen since the 1980s.

US disaster declarations, 1953-2021



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According to a [2015 Governmental Accountability Office report](#), the federal government pays out roughly 75% of expenses associated with presidentially declared disasters. So as the number of natural disasters has increased in recent years, so has the number of federal dollars needed to help in recovery.

The majority of federal funds for disaster relief come from the Federal Emergency Management Agency. Other agencies, such as the Department of Housing and Urban Development, Small Business Administration, and the Department of Defense also contribute to federal disaster relief grants.

Due to the increasing disaster relief costs for the federal government, a [Congressional Research Service paper from January 2022](#) suggests that Congress may consider limiting federal disaster relief spending. This would involve using measures such as relief limits, larger cost-share requirements from state and local governments, or changes in the disaster declaration process to raise the threshold for federal involvement.

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National Centers for Environmental Information

Billion-Dollar Weather and Climate Disasters

- [1] Billion-dollar natural disasters are adjusted for inflation in 2022 dollars. This means that adjusted for inflation in future years will increase the total number of billion-dollar disasters.
- [2] A derecho event is a widespread, long-lived windstorm that is associated with a band of rapidly moving showers or thunderstorms.
- [3] Natural disasters can occur in more than one state at a time.
- [4] Other budgetary strategies include supplemental appropriations, transfer authorities, and state agency budgets.



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