

# United State billion dollar weather and climate disasters: The increasing cost of extreme events in context

**Adam B Smith**

National Centers for Environmental Information, USA

## Abstract

Since 1980, the United States has been affected over 230 separate weather and climate disasters, in which damage costs exceeded \$1billion each. The cumulative cost for these events exceeds \$1.5trillion (U.S. dollars). There have been an increasing number of these events causing significant damage in recent years. From 1980 to 2017, the annual average number of billion-dollar events is 5.9 (inflation-adjusted) while the most recent 5year (2013 to 2017) annual average is 11.6 events (inflation-adjusted). The increase in population and material wealth over the last several decades are an important factor for the increased damage potential. These trends are further complicated by the fact that many population centers and infrastructure exist in vulnerable areas like coasts and river floodplains, while building codes are often insufficient in reducing damage from extreme events. Climate change is also playing an increasing role in the increasing frequency of some types of extreme weather that lead to billion-dollar disasters. Most notably the rise in vulnerability to drought, lengthening wildfire seasons and the potential for extremely heavy rainfall and inland flooding events are most acutely related to the influence of climate change. During 2017, the U.S. experienced a historic year of weather and climate disasters. In total, the U.S. was impacted by 16 separate billion-dollar disaster events including three tropical cyclones, eight severe storms, two inland floods, a crop freeze, drought and wildfire. More notably than the high frequency of these events is the cumulative cost, which exceeded \$300billion in 2017: A new U.S. annual record. This shattered the previous U.S. annual record cost of \$214.8billion (inflation adjusted). The damage from Hurricanes Harvey, Irma and Maria were responsible for approximately \$265.0billion of the \$306.2billion while the California wildfire damage of 2017 (\$18.0billion) tripled the previous U.S. wildfire cost annual record.

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## Biography

Adam Smith is NOAA's leading expert on disaster costs for the United States. Smith has expertise to homogenize and transition disparate disaster data sources into better quality-controlled disaster cost frameworks, as research tools and has expertise in developing methods to quantify natural disaster costs and uncertainty: <https://www.ncdc.noaa.gov/billions>. He sits on the U.S. Subcommittee on Disaster Reduction, is a NOAA

expert on U.S. disaster loss data in support of the international Sendai Framework for Disaster Risk Reduction (2016-Present) and is part of the Integrated Research on Disaster Risk interdisciplinary working group on Natural Disaster Risk/ Loss Data integration (2012–2015) and the American Meteorological Society Committee on Financial Weather/Climate Risk Management (2015–2017).