

Key Conclusions of the U.S. National Climate Assessment 2018

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The U.S. federal government on Friday 23 November released a long-awaited report (NCA4) with an unmistakable message: the effects of climate change, including deadly wildfires, increasingly debilitating hurricanes and heat waves, are already battering the United States, and the danger of more such catastrophes is worsening. The report's authors, who represent numerous federal agencies, say they are more certain than ever that climate change poses a severe threat to Americans' health and pocketbooks, as well as to the country's infrastructure and natural resources. And while it avoids policy recommendations, the report's sense of urgency and alarm stands in stark contrast to the lack of any apparent plan from President Trump to tackle the problems, which, according to the government he runs, are increasingly dire.

The congressionally mandated document, the first of its kind issued during the Trump administration, details how climate-fueled disasters and other types of changes are becoming more commonplace throughout the country and how much worse they could become in the absence of efforts to combat global warming.

The Fourth National Climate Assessment (NCA4) contains two volumes. Volume II draws on the foundational science described in Volume I, the Climate Science Special Report (CSSR). Volume II focuses on the human welfare, societal, and environmental elements of climate change and variability for 10 regions and 18 national topics, with particular attention paid to observed and projected risks, impacts, consideration of risk reduction, and implications under different mitigation pathways. Where possible, NCA4 Volume II provides examples of actions underway in communities across the United States to reduce the risks associated with climate change, increase resilience, and improve livelihoods.

The report concludes that Earth's climate is now changing faster than at any point in the history of modern civilization, primarily as a result of human activities. The impacts of global climate change are already being felt in the United States and are projected to intensify in the future—but the severity of future impacts will depend largely on actions taken to reduce greenhouse gas emissions and to adapt to the changes that will occur. The following summary information is excerpted from the report.

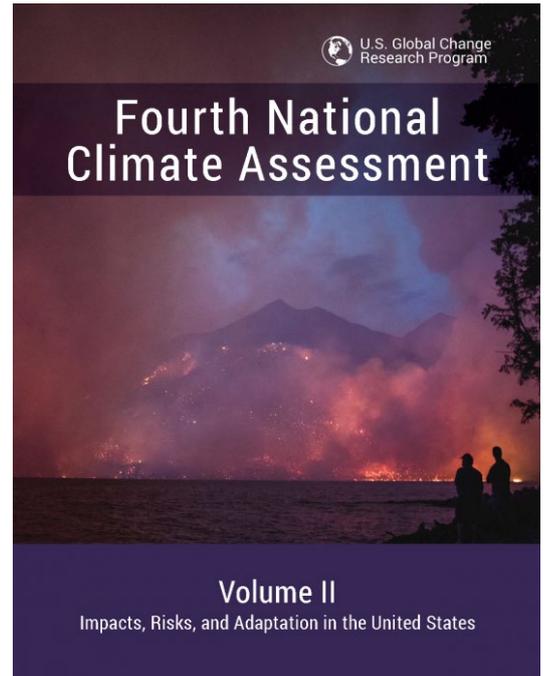


Figure 1 The US Government's Fourth National Climate Assessment Report



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1. Key Scientific Advances

The following scientific advances have been made since the previous assessment (NCA3) in 2014.

Detection and Attribution: Significant advances have been made in the attribution of the human influence for individual climate and weather extreme events.

Extreme Events and Atmospheric Circulation: How climate change may affect specific types of extreme events in the United States and the extent to which atmospheric circulation in the midlatitudes is changing or is projected to change, possibly in ways not captured by current climate models, are important areas of research where scientific understanding has advanced.

Localized Information: As computing resources have grown, projections of future climate from global models are now being conducted at finer scales (with resolution on the order of 15 miles), providing more realistic characterization of intense weather systems, including hurricanes. For the first time in the NCA process, sea level rise projections incorporate geographic variation based on factors such as local land subsidence, ocean currents, and changes in Earth's gravitational field.

Ocean and Coastal Waters: Ocean acidification, warming, and oxygen loss are all increasing, and scientific understanding of the severity of their impacts is growing. Both oxygen loss and acidification may be magnified in some U.S. coastal waters relative to the global average, raising the risk of serious ecological and economic consequences.

Rapid Changes for Ice on Earth: New observations from many different sources confirm that ice loss across the globe is continuing and, in many cases, accelerating. Since NCA3, Antarctica and Greenland have continued to lose ice mass, with mounting evidence that mass loss is accelerating. Observations continue to show declines in the volume of mountain glaciers around the world. Annual September minimum sea ice extent in the Arctic Ocean has decreased at a rate of 11%–16% per decade since the early 1980s, with accelerating ice loss since 2000. The annual sea ice extent minimum for 2016 was the second lowest on record; the sea ice minimums in 2014 and 2015 were also among the lowest on record.

Potential Surprises: Both large-scale shifts in the climate system (sometimes called “tipping points”) and compound extremes have the potential to generate outcomes that are difficult to anticipate and may have high consequences. The more the climate changes, the greater the potential for these surprises.

2. Extreme Events

Climate change is altering the characteristics of many extreme weather and climate-related events. Some extreme events have already become more frequent, intense, widespread, or of longer duration, and many are expected to continue to increase or worsen, presenting substantial challenges for built, agricultural, and natural systems. Some storm types such as hurricanes, tornadoes, and winter storms are also exhibiting changes that have been linked to climate change, although the current state of the science does not yet permit detailed understanding. Individual extreme weather and climate-related events—even those that have not been clearly attributed to climate change by scientific analyses—reveal risks to society and vulnerabilities that mirror those we expect in a warmer world. Non-climate stressors (such as land-use changes and shifting



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demographics) can also amplify the damages associated with extreme events. The National Oceanic and Atmospheric Administration estimates that the United States has experienced 44 billion-dollar weather and climate disasters since 2015 (through April 6, 2018), incurring costs of nearly \$400 billion (<https://www.ncdc.noaa.gov/billions/>).

3. Reducing Risks through Adaptation Actions

Key Message 1: Adaptation Implementation Is Increasing Adaptation planning and implementation activities are occurring across the United States in the public, private, and nonprofit sectors. Since the Third National Climate Assessment, implementation has increased but is not yet commonplace.

Key Message 2: Climate Change Outpaces Adaptation Planning Successful adaptation has been hindered by the assumption that climate conditions are and will be similar to those in the past. Incorporating information on current and future climate conditions into design guidelines, standards, policies, and practices would reduce risk and adverse impacts.

Key Message 3: Adaptation Entails Iterative Risk Management Adaptation entails a continuing risk management process; it does not have an end point. With this approach, individuals and organizations of all types assess risks and vulnerabilities from climate and other drivers of change (such as economic, environmental, and societal), take actions to reduce those risks, and learn over time.

Key Message 4: Benefits of Proactive Adaptation Exceed Costs Proactive adaptation initiatives—including changes to policies, business operations, capital investments, and other steps—yield benefits in excess of their costs in the near term, as well as over the long term. Evaluating adaptation strategies involves consideration of equity, justice, cultural heritage, the environment, health, and national security.

Key Message 5: New Approaches Can Further Reduce Risk Integrating climate considerations into existing organizational and sectoral policies and practices provides adaptation benefits. Further reduction of the risks from climate change can be achieved by new approaches that create conditions for altering regulatory and policy environments, cultural and community resources, economic and financial systems, technology applications, and ecosystems.

References

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