Climate Experts' Review of the DOE Climate Working Group Report

Summary for Policy Makers

Andrew E. Dessler, Texas A&M University
Robert E. Kopp, Rutgers University

The basic science of Earth's climate has been well established through two centuries of research. Over the 16 years since the Environmental Protection Agency's 2009 Endangerment Finding, the evidence for human-caused climate change and the dangers it poses to public health and welfare has continued to grow stronger. The report authored by the five members of the Department of Energy (DOE) Climate Working Group (CWG) and released by DOE on July 29, 2025, fails to adequately represent this reality.

This document is an expert review of the DOE CWG report. It represents the collective, self-organized efforts of more than 85 climate experts over the report's short, month-long comment period. As our review details, the CWG report exhibits pervasive problems with misrepresentation and selective citation of the scientific literature, cherry-picking of data, and faulty or absent statistics.

The DOE CWG report does not meet standards of quality, utility, objectivity and integrity appropriate for use in supporting policy making. In assessing the science of climate change, the U.S. government should follow standards appropriate for a Highly Influential Scientific Assessment, including an unbiased, robust, and transparent peer review process. Rigorously reviewed assessments, like the Intergovernmental Panel on Climate Change and National Climate Assessment reports, provide much more accurate representations of the scientific understanding of climate change.

The basic science of Earth's climate has been well-established through two centuries of research. Over the 16 years since the Environmental Protection Agency (EPA)'s 2009 Endangerment Finding, the evidence for human-caused climate change and the dangers it poses to public health and welfare has continued to grow stronger.

Recent assessments, such as the Intergovernmental Panel on Climate Change (IPCC)'s 2021 Sixth Assessment Report (AR6), confirm that the evidence shows that human influence is warming the atmosphere, ocean, and land in a way that is unprecedented for many centuries to millennia. The evidence that human-caused climate change is changing heat waves, heavy

rainfall events, droughts, hurricanes, and wildfires has grown. Across the coastal U.S., outside of parts of Alaska, rising sea levels are incontrovertibly causing an increase in coastal flooding.

The frequency, intensity, and duration of heat waves is increasing globally as a result of long-term, human-caused warming driven by greenhouse gas emissions.[1] **[Comment (Cmt.) 20, 37]** The magnitude and intensity of extreme precipitation has very likely increased since the 1950s in North America as a whole, and particularly in eastern North America.[2] **[Cmt. 21]** Climate change has intensified hydrological, ecological, and agricultural drought in the western U.S. and other regions around the world over the past few decades.[3] **[Cmt. 24]**

Although no trends in the number of hurricanes making landfall in the U.S. have been detected (and none were expected), hurricanes are becoming more hazardous. They are reaching higher intensity and intensifying more quickly. Higher sea levels are making their coastal flooding more extensive and damaging, and atmospheric warming is leading them to produce more rainfall, which is increasing their inland impacts.[4] **[Cmt. 18]**

Climate change has led to increased fire weather, longer fire seasons, and drier fuels. As a consequence, the likelihood and intensity of the most extreme wildfires has increased in North America, with major effects in the western U.S. These extreme fires have generated substantial ecological, economic, health, and livelihood impacts across the U.S. The consequences extend far beyond fire-prone regions due to smoke transport across continental distances, exposing populations nationwide to serious health risks.[5] **[Cmts. 25, 26]**

Sea-level rise is increasing risk to coastal communities. The rate of global-mean sea-level rise has more than doubled over the last 30 years, from about 0.08 inches/year in 1992 to 0.18 inches/year in 2024, and statistical analysis also reveals sea-level acceleration at many U.S. tide gauges and in contiguous U.S. tide gauges in aggregate. Along parts of the U.S. Atlantic and Gulf coasts, the number of days of coastal flooding per year have increased more than ten-fold since the 1970s as a result of sea-level rise, and relative sea-level rise is projected to increase high-tide flooding by 5-10x on average across the country's coast by 2050.[6] **[Cmt. 27]**

---

[1] The DOE CWG Report claims otherwise based on a fallacious interpretation of Dust Bowl conditions in the U.S. in the 1930s; see discussion below.
[2] The DOE CWG Draft Report claims otherwise based on limited sampling of the available data and precipitation extreme metrics.
[3] The DOE CWG Report focuses exclusively on meteorological droughts, which are evaluated based on low rainfall alone. Other definitions of drought are more relevant to impacts on public welfare. Agricultural and ecological drought are defined as water insufficient to meet agricultural and ecological needs, and factor into account phenomena like soil moisture and water balance (evaporation minus precipitation). Hydrological droughts are assessed based on low surface water flow and changes in runoff.
[4] The DOE CWG Report focuses on the (unsurprising) absence of a trend in landfalling hurricane frequency, while ignoring the evidence that hurricanes are becoming more hazardous.
[5] Illustrating the single-cause fallacy, the DOE CWG ignores the evidence for changes in fire weather and focuses exclusively on the role of fire management practices.
[6] The DOE CWG Report claims there is "no obvious acceleration in sea-level rise". It does not provide any statistical analysis to support this claim, nor does it discuss the extensive scientific literature demonstrating acceleration. The CWG Report does not discuss the present or future impacts of sea-level rise.

Economists have concluded that these and other effects of climate change will likely have significant negative impacts on the U.S. and global economy. Every additional ton of greenhouse gas emitted into the atmosphere increases global average temperature, and every additional amount of global warming escalates the danger to public welfare.[7] **[Cmt. 43]**

The report authored by the five members of the Department of Energy (DOE) Climate Working Group (CWG) and released by DOE on July 29, 2025, fails to adequately represent the current scientific understanding of climate change.

In contrast to the requirements for a committee established under the Federal Advisory Committee Act (FACA), no attempt appears to have been made to balance the points of view represented on the CWG; rather, this group appears to have been personally recruited by the Secretary of Energy to advance a particular viewpoint favored by DOE leadership.[8] The CWG members have, to their credit, previously published some of the ideas reflected in the CWG report in the peer-reviewed literature. The scientific community has previously examined them and delivered a collective, resounding rejection.[9]

Beyond the unbalanced membership of the CWG, the process that led to the CWG report does not include other guardrails to minimize bias in the report. For example, in contrast to the requirements for a FACA committee, the CWG's deliberations have been conducted in secret and without public record or notice. This also stands in contrast to the aims proclaimed by Executive Order 14303 ("Restoring Gold Standard Science"), which calls for science to be conducted in a manner that is transparent, without conflicts of interest, and subject to unbiased peer review.

It is also worth noting that an assessment of this type would normally have hundreds of authors, and would be written over the course of multiple years, with multiple rounds of internal and external review. A large author team allows each section to be written by experts on that exact topic. The DOE CWG report, due to its very small writing team, covers areas in which the authors are not experts and has led to many errors in the report caused by a lack of familiarity with the science.[10]

---

[7] As discussed below, the DOE CWG Report focuses on the small number of studies suggesting climate change is less damaging than most analyses suggest is most likely, while ignoring the larger number of studies suggesting climate change is more damaging than central estimates.

[8] https://www.cnn.com/2025/08/07/climate/wright-national-climate-assessments-updating

[9] The Report relies unusually heavily on citations to the authors' own work. Overall, nearly 11% of all citations in the report are to the work of one of the report authors. In chapters 3 and 5, more than a quarter of citations are self-citations. This compares to an average of 2.4% and a chapter maximum of 5.1% in the IPCC AR6 Working Group 1 report. **[Cmt. 48]**

[10] For example, the authors exhibit basic confusion about the concepts of Climate Impact Drivers and time of emergence **[Cmt. 36]**. They do not understand how the climate component of integrated assessment models are calibrated **[Cmt. 43]**. They do not correctly define relative sea-level change, and highlight as a major conclusion the important role of vertical land motion in relative sea-level change – something that has been understood since the nineteenth century **[Cmt. 27]**.

It is important to note the severe time constraints imposed on reviewing this document. The 30-day review period was inadequate for conducting a thorough and systematic analysis of this report.[11] Given that, we have undoubtedly failed to identify numerous additional errors, misrepresentations, and critical omissions throughout the text, and we have made errors of our own. The deficiencies highlighted in our comments should therefore be viewed as the tip of the iceberg — the document's true problems almost certainly extend far beyond what we were able to catalog in the limited time available.

This document is an expert review of the CWG report. It represents the collective, self-organized effort of more than 85 climate experts over the short, month-long comment period invited by Federal Register notice 90 FR 36150.

We are submitting our expert review in response to this Federal Register notice, but do so in full recognition that the notice provides no details on the review process.

The DOE CWG Report clearly meets the definition of a Highly Influential Scientific Assessment (HISA) under the Office of Management and Budget (OMB)'s Final Information Quality Bulletin for Peer Review (70 FR 2664). As such, OMB and EPA guidance require an unbiased peer review comparable in rigor to that conducted by the National Academies, as well as opportunities for public participation in report review and full documentation of responses to peer review comments. **[Cmt. 47]**

The obscure nature of the CWG review process stands in contrast to the process employed by National Climate Assessments (NCAs), which comply with the requirements for HISAs. The NCA reports undergo multiple stages of expert and public review, including peer review by the National Academies of Sciences, Engineering, and Medicine. The NCA's review editors — a group of experts independent of the authors — ensure that the report authors seriously consider and provide a public, written response to every substantive public and National Academies comment.[12] We do not know whether to expect from the CWG a similarly transparent, thorough, and independently overseen response to comments like ours.

As detailed in the over 400 pages of our expert review, the DOE CWG Report exhibits pervasive problems with misrepresentation and selective citation of the scientific literature, cherry-picking of data, and faulty or absent statistics.

Below, we discuss some high-level examples.[13]

[11] By comparison, the Third Order Draft of the Fifth NCA allowed for a 12-week comment period.
[12] While GlobalChange.gov, the Internet home of the US Global Change Research Program for more than a quarter-century, was shut down on June 30, 2025, the annotated responses to comments on the 2023 Fifth National Climate Assessment can be accessed through the Internet Archive at https://web.archive.org/web/20250630050603/https://nca2023.globalchange.gov/downloads/.
[13] For an overview of rhetorical strategies and reasoning fallacies that often appear in climate misinformation, see Cook, J. (2020). Deconstructing climate science denial. In D. C. Holmes & L. M. Richardson (Eds.), *Edward Elgar Research Handbook on Communicating Climate Change* (pp. 62–78). Edward Elgar Publishing. https://doi.org/10.4337/9781789900408.00014

Climate projections are driven by scenarios of future emissions of greenhouse gases and other climate forcers. The DOE CWG Report broadly claims that "scenarios widely-used in the impacts literature have overstated observed and likely future emission trends" (p. ix). This ambiguous language misrepresents the fact that climate scenarios are deliberately constructed to span a broad range of possible futures, from very low emissions to very high emissions. Current emissions of carbon dioxide from fossil fuels and land use are tracking near the middle of the scenario range used in AR6. Under AR6's Intermediate emissions scenario (SSP2-4.5), which assumes declining global CO_2 emissions in the second half of the century, late-century warming will very likely be 2.1-3.5°C above late nineteenth-century levels (about 1.5-2.9°C warmer than the 1990 baseline used in the EPA's Endangerment Finding). **[Cmt. 4, 6]**

The DOE CWG Report argues that climate models do not accurately describe recent climate trends. Toward that end, the DOE CWG cherry-picks evidence that support a low equilibrium climate sensitivity (ECS)[14] while ignoring or downplaying an overwhelming body of contradictory evidence that collectively led the IPCC to conclude that ECS is likely between 2.5°C and 4.0°C for a doubling of carbon dioxide concentrations. It also focuses on the highly uncertain, multi-century metric of ECS over less uncertain, more policy-relevant metrics, like those characterizing the nearer-term response of the climate to carbon dioxide emissions. **[Cmt. 9, 10]**

Indeed, in a separate part of its report, the DOE CWG Report accurately highlights the recent rapid increase in global mean surface temperature, with temperature in 2023 surpassing the previous record by nearly 0.2°C, and elevated temperatures persisting into 2025. As the DOE CWG Report notes, this is a topic of active scientific research, and might be tied to a decrease in the planet's albedo (reflectivity). One possible cause of this decrease is a potential strong positive cloud feedback; if true, this would argue for a higher ECS. This discussion is, however, ignored in the report's argument that climate models are too sensitive to greenhouse gas-induced warming. **[Cmt. 9, 35]**

The DOE CWG Report highlights the Dust Bowl period of the 1930s as a time of unusually hot temperatures in the United States, a period that in parts of the contiguous United States still dominates high temperature records. This is another example of cherry picking, as well as an example of the single cause fallacy (specifically, the idea that, because climate has varied naturally in the past, current changes must also be natural). However, over such a small area, natural variability plays a very large but temporary role. The Dust Bowl was indeed an exceptional event, and the decadal climate conditions that drove the Dust Bowl are not occurring today. Thus, the comparison between the 1930s and today does not tell us about the impact of anthropogenic climate change on today's extreme temperatures. The fact that high-temperature records are being reliably broken more frequently than low-temperature records – both globally and in the U.S. – is a clear indicator that humans are making extreme high temperatures more extreme. **[Cmt. 19, 20]**

[14] ECS measures the long-term (millennial-scale) response of global mean temperature to a fixed forcing, conventionally taken as an instantaneous doubling of carbon dioxide concentrations from their preindustrial levels

To argue that climate models overestimate warming, the DOE CWG Report, in another example of cherry-picking, highlights the U.S. Corn Belt, an area which makes up less than 1% of the area of the planet. The Corn Belt is the most agriculturally productive region on the planet – an area where land-use changes and natural variability over the last few decades have largely offset greenhouse gas warming. To the extent that models have problems in this very small region, it is connected to how well the models are handling the specific land-use changes occurring only in this region, not how well they represent global warming. In fact, in areas across the Northern Hemisphere, climate models are equally likely to overestimate or underestimate warming – exactly as expected for models that get the warming right. **[Cmt. 17]**

While in some cases, climate change can yield local benefits, on net its effects are harmful to welfare and economic output in the United States. **[Cmt. 38-43, 45]**

Although increasing carbon dioxide concentrations in isolation can increase crop yields, the DOE CWG report's focus on carbon fertilization is an oversimplification. In the real world, crops must simultaneously contend with the climatic effects of increasing greenhouse gases, including hotter temperatures and enhanced evaporation. The evidence suggests that CO_2-induced climate change, including rising temperatures, shifting weather patterns, and altered precipitation, will outweigh the benefits of CO_2 fertilization, leading to net yield declines across major agricultural regions in the U.S. and globally compared to what would happen without rising CO_2 concentrations. **[Cmt. 38]**

Although the DOE CWG Report notes that cold-related deaths in the United States are higher than heat-related deaths, their discussion overlooks the complexity of how climate change will reshape mortality patterns. While global warming may initially reduce deaths in some regions and increase them in others, heat-related mortality will increasingly dominate as temperatures continue to rise. The report also makes unrealistic assumptions about adaptation through air conditioning, failing to account for economic barriers that prevent access. Even in wealthy countries like the U.S., the poorest communities struggle to afford air conditioning, and this challenge is far more severe in developing nations. The DOE CWG report also ignored the fact that climate change has health impacts other than temperature-related mortality. These include a variety of pathways other than temperature, such as vector-borne diseases (like malaria and Lyme disease), food security and malnutrition, and air quality. **[Cmt. 41, 42]**

Human well-being is intertwined with the stability of natural systems: from safe food and clean water to disease regulation, mental health, and cultural identity. The DOE CWG Report omits discussion of the disruptive effects of climate change on wildlife and biodiversity, which are altering predator-prey relationships, increasing disease risks, and destabilizing ecosystems that underpin human well-being. The resulting economic impacts include reduced pollination and fisheries yields, damage to aquaculture, declines in ecotourism, costs from invasive species and harmful algal blooms, and cultural losses tied to species extinctions. By neglecting biodiversity impacts, the DOE CWG Report misses a key pathway by which greenhouse gas emissions endanger human health and prosperity. **[Cmt. 45]**

6

Adaptation is essential to manage climate risk, but it cannot eliminate it. For example, adaptation can reduce, but not eliminate, damages associated with future sea-level rise. Yet the United States is not optimally adapted even to current coastal hazards. Economically efficient adaptation will require substantial investments by individuals, industries, and all levels of government well in advance, and failure to make such investments will decrease economic stability. Furthermore, many low-lying regions will reach adaptation limits over the course of this century. However, the discussion of adaptation in the DOE CWG Report is very limited, and does not consider the costs of and barriers to either private or public adaptation, about which there is a significant literature. **[Cmt. 27]**

The climate can only be stabilized through the cumulative effect of many mitigation actions, and each marginal effort brings benefits for human welfare. In its discussion of the economic costs of climate change – and thus of the economic benefits of reducing greenhouse gas emissions – the DOE CWG Report looks at uncertainty about climate change and its impacts through rose-tinted glasses. It focuses not even on the most common estimates of possible outcomes, but on a cherry-picked set of outcomes where everything turns out better than most analysts expect, let alone fear. A long history of work on risk management points to the importance of considering the full distribution of outcomes, including low- or unknown-likelihood outcomes associated with high-impact risks. The DOE CWG's general approach would also argue against the purchase of insurance, the maintenance of a standing army in peacetime, and many other regularly accepted precautionary measures. **[Cmt. 43, 44]**

In short, the DOE CWG Report does not meet standards of quality, utility, objectivity and integrity appropriate for use in supporting policy making. In assessing the science of climate change, the U.S. government should follow standards appropriate for a Highly Influential Scientific Assessment, including an unbiased, robust, and transparent peer review process. Rigorously reviewed assessments, like the Intergovernmental Panel on Climate Change and National Climate Assessment reports, provide much more accurate representations of the scientific understanding of climate change.

7

About the writing team

This report arose organically when Dr. Andrew Dessler asked on Bluesky whether anyone was coordinating a response to the DOE CWG Draft Report. [15]Following his inquiry, multiple people encouraged him to take on the coordination role, which he ultimately agreed to do. He then put out a call for volunteers on social media. Many signed up and, as word spread, more scientists contacted him and volunteered to write a section. As the workload expanded, Dr. Robert Kopp volunteered to be co-editor of the effort.

In the end, more than 85 scientists contributed. Authors are mostly from the U.S., but with important contributions from Europe, Asia, Australia, and Canada. The age distribution was evenly split between early career, mid career, and senior. About 80% of the authors work at universities, with the rest at a variety of other institutions.

This report is the result.

Each section was authored by a particular writing team and responsibility for the contents of that section rests solely with them. Affiliations listed for any authors are included for identification purposes only. The opinions, findings, conclusions, and recommendations expressed are those of the authors and not their institutions. Some authors wished to remain anonymous, and they are not listed.

We would also like to acknowledge the editing team that took the disparate sections and, despite the extremely short time frame, put this document together: Lauren Cagle, Chris Colose, Jillian Gregg, Genevieve Guenther, Marc Jones, William Ripple, and Emily Williams.

[15] https://bsky.app/profile/andrewdessler.com/post/3lv4wamrpes2e