

Summary of Errors in the Fifth National Climate Assessment (NCA 5) and [Proposal to Reform] the NCA Process

Commented [TF1]: Should this be drafted as a proposed rulemaking?

I. Executive Summary

The fifth National Climate Assessment (NCA 5) by the U.S. Global Change Research Program (USGCRP) fails to meet the statutory requirements of the Global Change Research Act of 1990 (GCRA)¹ and violates Executive Order 14303, “Restoring Gold Standard Science” (EO14303).² NCA 5 must be replaced by an objective, science-based National Global Change Assessment that complies with the GCRA and EO14303.

Commented [TF2]: Do all NCAs so far rely to some degree on RCP 8.5? We could go further here and find that no prior NCA complies with the Executive Order

Under the GCRA’s terms, the USGCRP must issue periodic assessments to update policymakers on a variety of global changes. To fulfill its statutory mission to “describe and understand” the Earth’s systems and human impacts on them, such a report should be comprehensive, objective, and precise based upon realistic assumptions, include societal benefits of modest levels of warming, and account for human adaptation. In recent years, however, USGCRP assessments have become climate-focused documents that serve to increasingly served to justify predetermined policy and societal actions.

Commented [RS3R2]: No, but the use of a range of emissions scenarios go back to NCA1. I think it’s best to stick to the last 1-2 NCAs which represent the current state-of-the-art.

Compliance with the GCRA and EO14303 requires a new, revamped National Global Change Assessment authored by scientists with a track record of scientific integrity through a process that prioritizes scientific rigor over issues of social justice. It will also require a new commitment to descriptive science rather than prescriptive advocacy. This document proposes ___ key reforms to overhaul the upcoming NCA6 in line with directives from EO14303 and the GCRA’s statutory mandate:

Commented [RS4]: My changes here are meant to distinguish our approach from that of previous NCAs: I think hundreds of previous authors would object to the inference they were not comprehensive, or lacked scientific integrity.

Reform 1: Rename the report and address a broad range of global changes

Commented [RS5]: Renaming the report should not be considered a top reform

Reform 2: Reject implausible or outlier scenarios and properly address uncertainties

Reform 3: Address both positive and negative changes

Reform 4: Restructure committees and replace key personnel

Commented [RS6]: I think reforms should stick to the science problems of the NCAs, not bureaucracy.

[expand?]

Comments on this proposed rule are due within XX days of publication in the Federal Register.

¹ [HYPERLINK "https://www.globalchange.gov/about-us/legal-mandate"]

² [HYPERLINK "https://www.federalregister.gov/documents/2025/05/29/2025-09802/restoring-gold-standard-science"]

II. Introduction: The Need for Reform

Since its inception, the USGCRP's assessments have fallen short of their statutory charge under the GCRA "to improve understanding of global change" and inform policymakers in the United States. Congress intended for USGCRP to provide a holistic report on global change to help policymakers make objective policy decisions, but the NCA has served instead as a political tool for advancing an interventionist a specific climate policy agenda while introducing selection biases in scientific data. As such, it has fallen short of the intended goals of the GCRA.

Despite the NCA's failure to comply with the GCRA, it holds immense power. First, ~~ideological activists frequently cite~~ the NCA is frequently cited in climate litigation since recent NCAs rely upon highly improbably implausible future CO2 emissions scenarios and global climate models that produce too much warming even with realistic emissions scenarios CO2 assumptions, because it supports their arguments and is developed by 700+ academic authors. Second, the NCA provides a foundation for the 2009 Endangerment Finding that any greenhouse gas (GHG) emissions pose a significant threat to public health and welfare.³ The regulatory regime enabled by the Endangerment Finding has been one of the Environmental Protection Agency's (EPA's) most impactful tools in implementing energy and environmental policy in the United States since 2009.⁴ Third, numerous federal and state policymakers point to the NCA to justify policies that increase energy costs for U.S. consumers and manufacturers, limit economic growth, and add costs that disproportionately harm lower-income Americans.⁵ Those downsides of energy policies are seldom discussed, even though their costs will fall on U.S. citizens.

Commented [RS7]: 500+ authors. Also, many would view the large number of authors of evidence of increasingly widespread consensus (NCA1 had 112 authors. I counted)

The first Trump administration declined to correct course on the NCA. However, we find good reason to correct course today, particularly considering EO14303 and its admonition to return to gold standard science, including using realistic future emissions scenarios—rather than Representative Concentration Pathway (RCP) scenario 8.5 (RCP 8.5)—to assess the potential effects of climate change. We also find the May 2025 report commissioned by the Secretary of Energy, "Impacts of Carbon Dioxide Emissions on the U.S. Climate," to offer compelling reasons to revisit many of the conclusions in NCA 5 that were presented as incontrovertible.

The sixth National Climate Assessment (NCA 6) was under development until _____, scheduled for release in late 2027 or early 2028. With this rulemaking, we ensure compliance with GCRA and EO14303 and announce our intent to issue the new "National Global Change Assessment" (NGCA 1) on or around the same timeline as the proposed NCA 6.

³ [HYPERLINK "<https://www.epa.gov/climate-change/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a>"]

⁴ [HYPERLINK "<https://www.epa.gov/climate-change/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-clean-air-act-0>" \h] [add a list of major rules that rely on the endangerment finding?]

⁵ Need some examples.

III. ~~Specification of Errors in NCA 5 and Previous Reports~~

Commented [TF8]: Please feel free to tee off on this section. I pasted John's initial thoughts here

Past global change reports—which so far have been called National Climate Assessments—have repeatedly failed on ~~___ counts to comply with GCRA and/or EO14303. Specifically,~~

From JC:

Rejection of NCA5 based on significant problems. DoE-CR = Department of Energy Climate Report May 2025.

NCA5 failed to verify climate model output as fit-for-purpose. DoE-CR Ch4,5.

NCA5 relied on model output based on an implausible emissions scenario. DoE-CR Ch4,5

NCA5 misrepresented changes in extreme weather events by using short data records and improper mathematical analyses. DoE-CR Ch6.

NCA5 failed to investigate the full range of impacts, especially the positive impacts, of adding CO2 to the atmosphere while overstating the negative impacts. DoE-CR Ch1,2,3,9,11.

NCA5 failed to perform a comprehensive analysis of economic impacts of enhanced atmospheric CO2. DoE-CR Ch9-12.

NCA5 failed to perform ~~comprehensive~~ scientifically defensible analyses ~~(using the scientific method)~~ regarding attribution of those changes that have been observed. DoE-CR Ch8.

A. ~~The NCA ignores non-climate changes~~

The NCA is tasked with covering the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity and their respective long-term changes over 25 and 100 years.

Commented [RS9]: I would put as the first error the reliance on extremely unlikely CO2 emissions scenarios; RCP/SSP 8.5 is mentioned more than all other scenarios combined in NCA5.

Instead the NCA puts a narrow focus on climate and, for any given area of global change, only discusses the climate change-related impacts on that area. Societal changes such as population growth, economic development, technological advances, and increases in resilience receive little mention **IS THIS CORRECT**

Commented [RS10]: I'm not an expert on the NCAs but from what I've seen they do cover most if not all of the list in this paragraph.

B. ~~The NCA ignores positive changes~~

Even within its narrow focus of climate, the NCA should cover positive and negative climate changes. Instead, the NCA focuses entirely on negative climate changes and completely ignores positive climate changes.⁶

The NCA analyzes increases in danger potential from extreme weather with more warming, but ignores the far more massive decline in weather-related death rates at the national and global scale and the

⁶ [HYPERLINK "<https://nca2023.globalchange.gov/>" \h]

potential for growing wealth and technological advancements to make us even safer from climate and extreme weather.⁷

The NCA emphasizes a minor projected increase in heat-related deaths, but ignores the larger projected decrease in cold-related deaths thanks to warming and the preventability of temperature-related deaths in a wealthier and more technologically advanced US and global economy.⁸

The NCA emphasizes potential for negative impacts on agriculture thanks to climate change, but ignores benefits from increasing CO₂ and climate change and the far larger projected increase in agricultural productivity over the next century thanks to technological progress—which far outweighs the projected negative impacts even in high emissions scenarios.⁹

More broadly, the NCA completely fails to make any mention of the massive increase in climate resilience globally thanks to heating, A/C, irrigation systems, storm warning systems, infrastructure, and other such technology—despite the fact that these measures decreased the global decadal climate-related disaster death rate by an incredible 98% between 1920 and 2020, which required the historical use of fossil fuels and will continue to require fossil fuel use for the foreseeable future.¹⁰

⁷ [[HYPERLINK "https://energytalkingpoints.com/3-undeniable-facts-about-climate-for-cop29/"](https://energytalkingpoints.com/3-undeniable-facts-about-climate-for-cop29/) \h]

⁸ [[HYPERLINK "https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(21\)00081-4/fulltext"](https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(21)00081-4/fulltext) \h]

[[HYPERLINK "https://financialpost.com/opinion/bjorn-lomborg-climate-change-and-deaths-from-extreme-heat-and-cold"](https://financialpost.com/opinion/bjorn-lomborg-climate-change-and-deaths-from-extreme-heat-and-cold) \h] [[HYPERLINK "https://x.com/BjornLomborg/status/1611699218053308417"](https://x.com/BjornLomborg/status/1611699218053308417) \h] [[HYPERLINK "https://x.com/BjornLomborg/status/1611699218053308417"](https://x.com/BjornLomborg/status/1611699218053308417) \h]

⁹ [[HYPERLINK "https://thebreakthrough.org/issues/food-agriculture-environment/the-ipcc-report-on-the-impacts-of-climate-change-is-depressing"](https://thebreakthrough.org/issues/food-agriculture-environment/the-ipcc-report-on-the-impacts-of-climate-change-is-depressing) \h]

¹⁰ For every million people on earth, annual deaths from climate-related causes (extreme temperature, drought, flood, storms, wildfires) declined 98%—from an average of 247 per year during the 1920s to 2.5 per year during the 2010s.

Data on disaster deaths come from EM-DAT, CRED / UCLouvain, Brussels, Belgium – [[HYPERLINK "http://www.emdat.be"](http://www.emdat.be) \h] (D. Guha-Sapir).

Population estimates for the 1920s from the [[HYPERLINK "https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-database-2010"](https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-database-2010) \h], the Groningen Growth and Development Centre, Faculty of Economics and Business at University of Groningen. For years not shown, the population is assumed to have grown at a steady rate.

Population estimates for the 2010s come from [[HYPERLINK "https://data.worldbank.org/indicator/SP.POP.TOTL"](https://data.worldbank.org/indicator/SP.POP.TOTL) \h].

C. The NCA amplifies negative changes:

Commented [RS11]: I think this should be the first point.

When considering negative changes, the NCA should be precise. Instead, the NCA repeatedly exaggerates and fabricates negative climate changes.

Example: The NCA exaggerates projected climate harms using highly implausible emissions scenarios like RCP8.5.

The NCA uncritically employs a set of extremely implausible to impossible scenarios (e.g., RCP8.5/SSP3-7.0) in the projection of future outcomes, and treats them as equally plausible to other scenarios. Even though mainstream climatology views these scenarios and their associated projected outcomes—such as sea level rises of over 2 meters by the year 2100—to be incredibly unlikely, are regarded as implausible, the NCA describes these scenarios as all being plausible futures and even regards these scenarios as worth emphasizing.

For example, the NCA5 mentions that “mass fish die-offs from extreme summertime heat are projected to double by midcentury in northern temperate lakes under a very high scenario (RCP8.5).” No other outcome under a different scenario is mentioned in this context, despite this being an incredibly unlikely to impossible implausible scenario. And there is no mention of the uncertainties involved in such an extreme and unlikely projection.¹¹

Another example comes from the electricity sector. NCA5 states that “Annual expenditures on electricity transmission and distribution infrastructure *could* rise up to 25% by 2090 under a very high scenario (RCP8.5) compared to a scenario without climate change.” (emphasis added) There is no attempt to assess the likelihood of this outcome, no mention of any other more realistic scenario, no acknowledgement that a scenario without climate change is impossible and not a sound baseline for comparison. There is also no mention that the promoted climate policies in NCA5—increasing reliance on green electricity from solar and wind—have already and would continue to massively increase the cost of such infrastructure, while some simple adaptation measures—like burying transmission lines—could likely nullify the potential impacts of extreme weather on such infrastructure by the late 21st century.¹²

Example: The NCA exaggerates harms from extreme weather events using the pseudoscientific “billion-dollar disaster” statistic.

The NCA uncritically cites the National Oceanic and Atmospheric Administration’s NOAA’s “billion-dollar disasters” statistic, which counts the number of natural disasters in the U.S. each year that cause at least \$1 billion in damages, as evidence that “[h]armful impacts from more frequent and severe extremes are increasing across the country”—despite the inadequacy of disaster cost statistics to derive extreme weather trends because of the multiple factors—like economic growth and disproportionately increasing populations in vulnerable spots—involved, and the enormous methodological and data collection flaws in NOAA’s product, which violate basic principles of scientific integrity and transparency.¹³

¹¹ [HYPERLINK "<https://nca2023.globalchange.gov/>" \h]

¹² [HYPERLINK "<https://nca2023.globalchange.gov/>" \h]

¹³ [HYPERLINK "<https://www.ncei.noaa.gov/access/billions/>" \h]
[HYPERLINK "<https://doi.org/10.1038/s44304-024-00011-0>" \h]

NOAA's billion dollar disaster statistic represents an outlier finding in defiance of available quality scientific publications and the IPCC, which finds that most human impacts on climate extremes like storms and floods are yet undetected and will likely remain so for the rest of the century, even assuming very high emission scenarios.¹⁴

Based on the scientific literature, disaster cost trends are flat and can mostly or even completely be explained by increases in demographic trends and increasing concentrations of wealth in vulnerable areas like coastlines, rendering the NCA's claims at minimum a major exaggeration of the truth.¹⁵

The NCA fails to acknowledge uncertainty.

Despite the statute's mandate that USGCRP's report "discusses the scientific uncertainties associated with such findings," the NCA completely fails to identify the extremely high levels of uncertainty associated with these future outcomes.

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[Additional examples] may be found in the public comment and response record.¹⁶

Commented [TF 12]: Does anyone want to comb through the record and find some of the more egregious examples?

[HYPERLINK "https://rogerpielkejr.substack.com/p/billion-dollar-disasters-are-a-national?utm_source=publication-search" \h]

[HYPERLINK "https://rogerpielkejr.substack.com/p/billion-dollar-disasters-not-the" \h]

¹⁴ [HYPERLINK "https://rogerpielkejr.substack.com/p/what-the-ipcc-actually-says-about?utm_source=publication-search" \h]

¹⁵ [HYPERLINK "https://rogerpielkejr.substack.com/p/climate-change-is-showing-its-claws" \h]

¹⁶ [HYPERLINK "https://nca2023.globalchange.gov/downloads/NCA5_Public-Comments-Author-Responses-ZOD.pdf" \h]

IV. Reforms to the USGCRP

A. Rename the report and address a broad range of global changes

DON'T LIKE THE WORLD GLOBAL HERE. ARE WE REALLY TALKING ABOUT AFRICA ETC

To date, the global change report has failed to comply with the GCRA because it is not comprehensive. The report is renamed the "National Global Change Assessment" and must address "global change" as it is defined in the statute. Past reports including NCA5 have interpreted the term to mean something like "climate change and its related global effects." But while "global change" includes climate change, it is not limited to it. We will stake out a broader scope for the report, which will include important trends and help to close relevant knowledge gaps about potentially important topics, as intended by Congress.

In particular, the revamped assessment will highlight trends in things like [please add items as necessary] energy production/use, known reserves, deaths from natural disaster and temperature exposure, human health, agricultural production, total/coastal populations, criteria pollutant emissions, forest cover, solar insolation, potable water, etc.

The word global is misleading and ambiguous here. We should be talking about a comprehensive climate risk assessment for the US

Commented [RS13]: I don't understand this. The NCAs include all kinds of (supposed) changes, and if anything they IGNORE global effects, and instead address climate change effects in just the U.S.

Commented [RS14]: The NCAs already cover most of these.

B. Reject unrealistic scenarios and address uncertainties

The next assessment shall not rely on any implausible emissions scenarios. For example the next assessment must not include any references to UNIPCC report outcomes or similarly flawed other analyses that are based on SSP3-7.0 or RCP8.5, which are now known to involve unrealistically high future CO2 emissions.

The next assessment shall examine the plausibility and limitations of scenarios describing the potential future under global changes and limit its analysis to scenarios that are at least within the likely range of possible developments. For climate scenarios this should mean a limit to those futures that feature no more than 3°C of warming above preindustrial levels.

Commented [TF15]: From EO14303: "agencies have used Representative Concentration Pathway (RCP) scenario 8.5 to assess the potential effects of climate change in a "higher" warming scenario. RCP 8.5 is a worst-case scenario based on highly unlikely assumptions like end-of-century coal use exceeding estimates of recoverable coal reserves. Scientists have warned that presenting RCP 8.5 as a likely outcome is misleading."

Commented [TF16]: Should probably mention and spell this out earlier in the document

Commented [RS17]: Future warming depends upon emissions scenarios PLUS climate model sensitivity, which hasn't been discussed yet.

C. Is This a New Reform Topic?

The next assessment shall acknowledge uncertainty about future changes and the potential of humans to adapt to or mitigate negative impacts through technological advancements. The goal is to identify key drivers of human well-being, including economic prosperity and freedom of action to optimize these factors on the individual, national, and global level.

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D. Is This a New Reform Topic?

The next assessment must be regarded as a "highly influential scientific assessment" under the Information Quality Act (IQA), subjecting its review to additional obligations, including: reproducibility, transparency, utility, traceability, objectivity and integrity. To date, assessments falsely claim to have complied with these provisions of the IQA based on supposed compliance by the more than 700 authors

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of the assessment who were tasked with evaluating their sources of information using a decision tree and IQA questionnaire. The public has never been provided with these evaluations.

The new Committee should consider making all prior (self-assessment) evaluations publicly available. If the Committee is unable to find these evaluations, the public should be informed the federal government has no (or incomplete) records of these evaluations.

Commented [RS18]: This seems out of place

E. Is This a New Reform Topic?

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The next assessment must use proper language to accurately inform decisionmakers and the public. To date, the assessments use inconsistent outcome metrics and do not use risk assessment terms consistent with established practice, resulting in unlikely findings, and non-compliance with the GCRA and the IQA. A new assessment should use consistent definitions of “risk”, “hazard”, “vulnerability”, “consequences” and “impacts.” “Risk” should be the probability-weighted combination of “hazard” (hazard identification and dose-response) and “exposure” (exposure assessment). To date, the assessments have portrayed hazards as actual exposures.

C.F. Address both positive and negative changes

To date, the global change report has failed to be an objective piece of written communication. The Director of the Office of Science and Technology Policy (OSTP) and Committee must follow the statute and seek information on “changes,” meaning both positive and negative trends.

The next assessment shall include potential costs and benefits of various global changes and discuss them in light of larger domestic and global trends. For example, the impacts of GHG emissions over the next 25 or 100 years on agriculture must include an assessment of actual trends in agriculture, which show a net increase in food production globally and in the US. GHG emissions have many nuances effects including the fertilization effect of carbon dioxide on plants, not just warming impacts.

D.G. Restructure committees and replace key personnel

To date, the global change report has failed to follow the principles of objectivity and to comply with the statute. These failures can be attributed, in part, to the choice of lead authors creating the report. The authorship of the NCAs has increased dramatically since NCA1 (112 authors) to NCAS (over 500 authors). This is the direct result of at least two problems: (1) large governmental research budgets funding a marching army of climate researchers, and (2) overly sensitive global climate models that produce an endless source of alarming future climate changes in response to unrealistic future CO2 concentrations in the atmosphere.

This bloat in NCA authorship, as well as in various steering committees, expert advisory panels, and review boards must be curtailed. To follow the GCRA and EO14303, USGCRP will insist on a careful selection of leadership for a brand new report amongst candidates who have a track record of scientific integrity and who lack personal or professional conflicts of interest with regards to the global change report and its potential policy implications.

For example, the choice of authors such as Zeke Hausfather of Stripe, Inc., a business that profits from carbon offset mandates, and Katherine Hayhoe, a leader of the environmental political advocacy group Nature Conservancy, are highly concerning from both a financial conflict of interest and ideological perspective.

In addition to questionable authors, there have been questionable reviewers. For example, the 2021 National Academies report titled “Global Change Research Needs and Opportunities for 2022-2031” included contributors who are advocates for lawsuits against energy companies.¹⁷ Kristie Ebi, vice chair and curriculum advisor for the Climate Judiciary Project, promotes climate activism by judges.

USGCRP will appoint lead authors of the new report who have an exceptionally strong track record of scientific integrity and objectivity. These authors shall be appointed by a combination of (1) a new Request for Proposals for candidates and choosing among those who respond and (2) a top-down approach wherein the members of the Committee nominate potential authors and then, with the approval of the OSTP, the USGCRP director contacts them and engages them on a work agreement.

¹⁷ See here: [HYPERLINK "<https://nap.nationalacademies.org/catalog/26055/global-change-research-needs-and-opportunities-for-2022-2031>" \h]

V. Conclusion

The assessments undertaken so far under the GCRA fail to satisfy the requirements of that statute. They also cannot comply with EO14303 because they include implausible future emissions scenarios. USGCRP hereby rejects NCA 5 and previous assessments and initiates a new process for completing a National Global Change Assessment that will follow the GCRA and advance the gold standard science required by EO14303.