



Memorandum

To: Lisa Bacanskas, U.S. EPA
From: Amanda Vargo, Paula Garcia Holley, and Brad Hurley, ICF
Date: August 25, 2021
Re: Peer Review Report and Documentation of Peer Review Process for *Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts*

ICF managed the peer review of the report titled *Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts*. This memorandum summarizes the peer review process.

Please contact Brad Hurley at +1 (202) 640-2484 or brad.hurley@icf.com with questions or comments.

Introduction

Under contract 68HERH19D0029, order No. 68HERH21F0052 with the U.S. Environmental Protection Agency's Climate Change Division, ICF managed the peer review of the draft report titled *Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts*. The purpose of this memorandum is to summarize the peer review process for the record.

Peer Review Process

Work product categorization

This independent peer review was conducted in accordance with EPA's Peer Review Handbook (EPA 2015).¹ The type of work product reviewed has been categorized as "Other Scientific and Technical Work Product" as indicated in EPA's Peer Review Plan and the "Product Categorization for Climate Change and Social Vulnerability in the United States: A Focus on Six Key Sectors" memorandum from Jeremy Martinich to Rona Birnbaum, dated February 22, 2021.² Peer review of Other Scientific and Technical Work Product is not required per Section III of the Peer Review Handbook; however, work products will have greater standing in the scientific community if an independent peer review is completed (EPA 2015). Therefore, peer review for Other Scientific and Technical Work Products should be conducted if the Decision Maker determines that it is appropriate.

Peer review mechanism and logistics

The peer review was conducted as an external individual letter review. Three peer reviewers were provided, on April 13, 2021,³ with the draft report and an individualized letter indicating the charge questions. One additional peer reviewer was provided with the draft report and charge questions on April 23, 2021, and the final additional peer reviewer was provided with the draft report and charge questions on April 29, 2021. The charge letter is provided below for the record. The initial three peer reviewers were asked to provide written responses to ICF's peer review coordinator by May 10, 2021; the additional two reviewers were given until May 17, 2021 to complete their reviews. ICF sent the reviewers' responses directly to EPA and also prepared a response-to-comments matrix in consultation with EPA.

Peer Reviewers

Peer Reviewer Expertise

EPA's statement of work stipulated enlisting five to seven qualified peer reviewers. ICF independently selected the reviewers, consistent with the guidelines of the EPA Peer Review Handbook (2015). ICF subject matter experts identified 35 potential peer reviewers for this report, from which a smaller pool of 10 individuals were selected who collectively met the following technical selection criteria provided by EPA:

¹ United States Environmental Protection Agency (EPA). 2015. Science and Technology Policy Council Peer Review Handbook 4th Edition. Available online at: https://www.epa.gov/sites/production/files/2016-03/documents/epa_peer_review_handbook_4th_edition.pdf.

² The term "Other" means any scientific and technical work product that does not meet the OMB guidelines' criteria for influential information (EPA 2015).

³ An additional peer reviewer received the draft report and charge letter on April 13, 2021; however, this reviewer subsequently dropped out of the peer review and was replaced with an alternate from ICF's pool of potential reviewers.

- Expertise and a strong background in, at least one, of the following:
 - Applied climate change impacts modeling and analysis;
 - Climate and social vulnerability modeling and analysis;
 - Environmental economics, in particular the valuation or monetization of climate change impacts;
 - Communication of environmental issues (preferably climate change);
 - Human health impacts of climate change (preferably with knowledge about at least one of the following topics: air quality, temperature mortality, labor allocation); and
 - Infrastructure impacts (preferably with expertise in at least one of the following topics: coastal property and roads).

ICF also considered:

- Experience in providing peer reviews for similar types of work products;
- No association with the social vulnerability report and its recent updates; and
- Interest and availability.

ICF proposed the pool of 10 candidates to EPA on March 30, 2021. Upon EPA confirmation that the candidate pool met the selection criteria, ICF selected six reviewers who would collectively provide the optimal overall balance to identify and address all significant issues in the technical charge. Of the initial six reviewers selected, three declined; the three others accepted but one of them subsequently dropped out. ICF reached out to three alternate reviewers from the pool of 10 candidates. All three of those individuals agreed to participate in the peer review, but two subsequently dropped out. To replace the reviewers and meet the five peer reviewer requirement, ICF contacted an additional alternate from the larger pool of 35 potential reviewers. This individual agreed to participate, bringing the total number of confirmed reviewers to five. Each of the reviewers selected has recognized expertise in at least one of the fields identified in EPA's selection criteria.

Conflict of Interest Review

Each reviewer signed a conflict of interest certification form, confirming that they had no organizational or personal conflicts of interest. ICF reviewed all of these forms and determined that there were no personal or organizational conflicts of interest that would affect the reviewers' impartiality. This form also included requirements for reviewers to hold materials provided to them for the purpose of the review as confidential, and to promptly report any conflicts of interest, should one arise during the course of completing the peer review. The signed conflict of interest certification form was received prior to the distribution of the draft report and charge letter. The conflict of interest certification form was based on Appendix J of the EPA Peer Review Handbook (2015) and is included in the sections below.

After review of the conflict of interest forms and follow-up inquiries, as necessary, it was determined that there was no conflict of interest or perception of conflict of interest. For instances in which funding of research was provided from a Government Agency it was corroborated that funds were not from EPA or were obtained through an investigator-initiated, peer-reviewed competition. In addition, all reports of public statements (e.g., media presence) were reviewed and it was determined that statements issued were factual and would not affect the peer reviewer's impartiality.

Selected Peer Reviewers

Table 1 below identifies the peer reviewers participating in the review, their organizational affiliations, and rationale for selection.

Table 1. Participating Peer Reviewers

Peer Reviewer	Affiliation	Rationale for Selection
Dr. Amit Armstrong	Federal Highway Administration	Expertise in climate risks to roads and other transportation infrastructure, climate change adaptation, and resilience, communications.
Dr. David M. Hondula	Arizona State University	Expertise on social and health effects of extreme heat, data analysis, modeling, simulation, and adaptation and resilience.
Dr. Klaus Moeltner	Virginia Tech	Expertise in environmental and resource economics, coastal flooding, housing markets, forest damage, recreation, and public health.
Dr. Colin Polsky	Florida Atlantic University	Expertise in the human dimensions of climate change, including expertise in risks to coastal property, climate risks to agriculture, and social vulnerability.
Dr. Benjamin Ruddell	Northern Arizona University	Expertise in engineering, hydrology, roads, coastal flooding, and heat-related morbidity and mortality.

Materials and Information Provided to Reviewers

Charge Letter

Peer Review Charge

Draft Climate Change and Social Vulnerability in the United States: A Focus on Six Sectors

Peer Review Conducted by ICF Incorporated, L.L.C.

Under U.S. EPA Contract 68HERH19D0029, Order # 68HERH21F0052

OVERVIEW

Across the U.S., some individuals and communities are more susceptible to disproportionate harm from climate change due to differences in exposure and vulnerability to climate hazards. This report investigates the projected risks of climate change to socially vulnerable populations in the U.S. across six of the most economically significant impact sectors: air quality, heat stress, labor, roads, coastal flooding, and inland flooding. It includes analysis of whether and to what extent high-level risks will be experienced disproportionately by socially vulnerable communities and examines trends in these impacts at the regional level.

PURPOSE OF PEER REVIEW

The purpose of peer review by independent, qualified, and objective experts is to ensure that the information summarized by EPA is technically supported, competently performed, properly documented, consistent with established quality criteria, and communicated clearly. The methods and applications underlying the sectoral impact modeling of the report have been previously peer reviewed and published in the research literature or are in the process of completing peer review.⁴ However, the use of these methods to investigate whether socially vulnerable populations are disproportionately affected by climate impacts is novel, and therefore is the primary focus of the peer review. The reviewers are also asked to provide review and feedback on whether EPA has appropriately summarized results across impact sectors, populations, and regions. Note that this report is for science dissemination and communication purposes only and does not reflect analysis of nor recommendations regarding any particular policy.

INSTRUCTIONS

The overall assignment is to review the *Climate Change and Social Vulnerability in the United States: A Focus on Six Sectors* report. We welcome and appreciate your comments on any aspect of the report, but responses to the charge questions listed below would be particularly useful. For the charge questions, please provide written responses to explain and justify the rationale for your response and, where possible, specific recommendations and/or relevant references (a simple yes or no response is not acceptable). In addition, if you are providing specific feedback please do so in concise bullets in the respective sections below. Although an overall assessment is required, we appreciate if you could pay particular attention to the main sectors of your expertise while conducting the review, or if a question is outside your area of expertise, please indicate this in your response.

⁴ Journal peer review processes will serve as the primary processes for evaluating the quality and documentation of these new scientific approaches.

Please provide written comments on these questions, or any additional comments that you would like to share on this report, by **May 10th, 2021**. Please submit your comments to Paula Garcia Holley (the ICF manager for this review process) at Paula.GarciaHolley@icf.com.

CONFIDENTIALITY

Upon receipt of the review materials, you should not distribute the materials under review or have communications with colleagues, members of the public, EPA, or other federal agencies on the materials. You will receive notification when EPA releases the report.

ACKNOWLEDGMENTS

Your name and affiliation will be noted in the front matter of the final report and included in the peer review report for the record. EPA will insert the following statement in this section: "Information and views expressed in this report do not necessarily represent those of the peer reviewers, who also bear no responsibility for any remaining errors or omissions."

Your time and expertise in reviewing this report are greatly appreciated. If you have any questions about the report or this review process, please contact Paula Garcia Holley.

CHARGE QUESTIONS AND RESPONSE FORMS

Question 1

Question 1: Does the introductory chapter clearly explain the purpose of the report and provide appropriate context for the sector chapter results? If not, please provide recommendations for improvement.

[Please enter response here]

Please add any specific comments related to Question 1 in the table below (add rows as needed).

Section/page/line number	Comment	Supporting Materials (full citation and provide attachment, if possible)

Question 2

Question 2: The report has been written for an educated but general audience. Are the writing level and graphics appropriate for these audiences?

[Please enter response here]

Please add any specific comments related to Question 2 in the table below (add rows as needed).

Section/page/line number	Comment	Supporting Materials (full citation and provide attachment, if possible)

Question 3

Question 3: Does the report adequately explain the overall analytic framework of the project, such that results across multiple sectors can be communicated in a consistent manner? Are the inputs and scenarios clearly explained and documented in the main report and appendices?

[Please enter response here]

Please add any specific comments related to Question 3 in the table below (add rows as needed).

Section/page/line number	Comment	Supporting Materials (full citation and provide attachment, if possible)

Question 4

Question 4: Do the text, figures, and tables in the sector specific chapters clearly communicate the modeling results?

[Please enter response here]

Please add any specific comments related to Question 4 in the table below (add rows as needed).

Section/page/line number	Comment	Supporting Materials (full citation and provide attachment, if possible)

Question 5

Question 5: Are the determinants of social vulnerability and metrics of disproportionality considered in the report clearly described?

[Please enter response here]

Please add any specific comments related to Question 5 in the table below (add rows as needed).

Section/page/line number	Comment	Supporting Materials (full citation and provide attachment, if possible)

Question 6

Question 6: As described in the report, the technical appendices for each sectoral impact contain detailed information regarding the methodology and full sets of modeling results. The main sectoral sections of the report are intended to summarize their respective appendices for the more general audience of the report. Do the main sectoral sections properly summarize the underlying information?

[Please enter response here]

Please add any specific comments related to Question 6 in the table below (add rows as needed).

Section/page/line number	Comment	Supporting Materials (full citation and provide attachment, if possible)

Question 7

Question 7: Does the report, including the executive summary, draw appropriate findings and conclusions from the modeling results? Does the executive summary provide sufficient context to understand the synthesized results? Is the draft report missing important findings or messages based on your review?

[Please enter response here]

Please add any specific comments related to Question 7 in the table below (add rows as needed).

Section/page/line number	Comment	Supporting Materials (full citation and provide attachment, if possible)

Question 8

Question 8: Sources of uncertainty across the modeling project are described upfront in the report, while the most important caveats for each sector are discussed in the respective appendices (with references to the underlying research papers where these issues are described in more detail). With this in mind, does the report adequately inform the reader regarding how the results should be interpreted and used, given the limitations?

[Please enter response here]

Please add any specific comments related to Question 8 in the table below.

Section/page/line number	Comment	Supporting Materials (full citation and provide attachment, if possible)

GENERAL COMMENTS

Please provide any additional feedback, including any recommendations on how this report can be improved.

[Please enter response here]

Please add any specific comments not related to the charge questions above in the table below (add rows as needed).

Section/page/line number	Comment	Supporting Materials (full citation and provide attachment, if possible)

Conflict of Interest

Confidential Peer Review Conflict of Interest Certification

For individuals acting as a peer reviewer of the report “Climate Change and Social Vulnerability in the United States: A Focus on Six Sectors”

The peer review of this report is sponsored by the
U.S. Environmental Protection Agency
Climate Change Division (OAR/OAP)

Background

It is essential that peer review not be compromised by any significant conflict of interest. For this purpose, the term “conflict of interest” means any financial or other interest that conflicts with the service of the individual because it 1) could significantly impair the individual’s objectivity or 2) could create an unfair competitive advantage for any person or organization.

Disclosure and Certification

To the best of my knowledge and belief, I have no actual, apparent, or potential organizational or individual conflicts of interest relating to this review that would prevent me from providing a credible and unbiased review. I have disclosed below any relevant organizational affiliations, public statements and positions, and any additional aspects of my background that might reasonably be construed by others as affecting my judgement in matters related to this peer review, and therefore might constitute an actual or potential source of bias.

I understand that the materials provided to me for the purpose of this review are not to be redistributed in part or in whole to any individual or organization at any time during or after the completion of the review without explicit written approval.

During the period of this review, I recognize my continuing obligation to identify and promptly report any actual or potential conflicts of interest that may arise.

Disclosures:

1. Please complete the table below. If any of the responses to the questions is yes, please provide an explanation regarding the nature of the potential conflict. Specifically, if compensated expert witness activities have been undertaken, please provide a brief description of each issue and testimony (attach a separate page as needed).

	Yes	No	Additional Information Regarding Potential Conflict of Interest
To the best of your knowledge and belief, is there any connection between the subject topic and any of your and/or your spouse’s compensated or uncompensated employment, including government service, during the past 24 months?			
To the best of your knowledge and belief, is there any connection between the subject topic and any of your and/or your spouse’s research support and project funding, including from any government source, during the past 24 months?			
To the best of your knowledge and belief, is there any connection between the subject topic and any consulting by you and/or your spouse, during the past 24 months?			

	Yes	No	Additional Information Regarding Potential Conflict of Interest
To the best of your knowledge and belief, is there any connection between the subject topic and any expert witness activity by you and/or your spouse, during the past 24 months?			
To the best of your knowledge and belief, have you, your spouse, or dependent child, held in the past 24 months, any financial holdings (excluding well-diversified mutual funds and holdings, with a value less than \$15,000) with any connection to the subject topic?			
Have you made any public statements or taken positions on or closely related to the subject topic under review?			
Have you had previous involvement with the development of the document (or review materials) you have been asked to review?			
To the best of your knowledge and belief, is there any other information that might reasonably raise a question about an actual or potential personal conflict of interest or bias?			
To the best of your knowledge and belief, is there any financial benefit that might be gained by you or your spouse as a result of the outcome of this review?			

2. If applicable, please provide additional disclosures that may not be included in the table above (attach a separate page as needed).

Signature

Name and Title

Date

Complete and return to Paula Garcia Holley (ICF) at Paula.GarciaHolley@icf.com

Retain a copy for your records.