

Assessment Development Process



Appendix 1. Assessment Development Process

Authors and Contributors

Federal Coordinating Lead Author

Allison R. Crimmins, US Global Change Research Program

Chapter Lead Author

Christopher W. Avery, US Global Change Research Program / ICF

Authors

Samantha Basile, US Global Change Research Program / ICF

Allyza Lustig, US Global Change Research Program / ICF

Review Editor

Therese S. Carter, George Washington University

Cover Art

Diane Burko

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A1.1. The US Global Change Research Program

Founded by Presidential Initiative in 1989 and codified by the Global Change Research Act of 1990,¹ the US Global Change Research Program (USGCRP) is charged with developing and coordinating “a comprehensive and integrated United States research program which will assist the Nation and the world to understand, assess, predict, and respond to human-induced and natural processes of global change.”

USGCRP operates under the direction of the National Science and Technology Council as a confederation of 14 federal departments and agencies and is overseen by the White House Office of Science and Technology Policy (OSTP). The Subcommittee on Global Change Research (SGCR) oversees USGCRP’s activities and coordinates interagency activities through the USGCRP National Coordination Office and informal interagency working groups. More information on USGCRP activities can be found at www.globalchange.gov and in the Decadal Strategic Plan.²

A1.2. Roles and Participants in NCA5

The Fifth National Climate Assessment (NCA5) followed a similar structure and governance model as the previous NCA, with roles and responsibilities described in Table A1.1.

Table A1.1. Descriptions of Roles for NCA5 Participants

Role	Description
Federal Steering Committee (FSC)	The FSC consisted of one representative from each USGCRP member agency. In consultation with the SGCR, the FSC was responsible for selecting CLAs, CLs, and REs; determining scope and content; and overseeing development and production of NCA5, including ensuring that the process adhered to principles of engagement and transparency.
Federal Coordinating Lead Author (CLA) and Agency Chapter Lead (ACL)	CLAs served as the federal coordinating lead for each chapter. ACLs provided additional agency input to chapter teams. Both CLAs and ACLs were responsible for coordination across chapters to ensure consistency and accuracy throughout the report and to ensure that chapters adhered to author guidance. CLAs were responsible for recommending CLs to the FSC. The FSC was responsible for reviewing and approving CLs.
Chapter Lead Author (CL)	CLs were responsible for the ultimate delivery of their chapter for approval and publication. These responsibilities included selecting a diverse and qualified author team and overseeing all aspects of development, assessment, writing, and editing of their chapter.
Chapter Author (CA)	CAs contributed writing, developed figures, responded to comments, and revised chapter drafts under the direction of the CLs. Each chapter’s Key Messages represent the consensus of the CAs and CL.
Technical Contributor (TC)	TCs provided discrete, specific technical contributions on an as-needed basis, as identified by the CL. TCs did not participate in the consensus process of developing Key Messages.

Role	Description
Review Editor (RE)	REs, selected by the FSC from a public call for nominees, were responsible for ensuring that all substantive public and peer-review comments were appropriately addressed and documented by author teams.
Staff Point of Contact (POC)	USGCRP National Coordination Office staff filled the roles of POCs, providing administrative support, chapter coordination, and guidance throughout report development.
Technical Support Unit (TSU)	The NOAA TSU supported climate science data analysis; editing; figure development; data management and documentation; web design and development; and graphic design, layout, and other production activities.

A1.3. Creating the NCA5 Report

The NCA5 development process launched in February 2020 with the seating of the NCA5 Federal Steering Committee (FSC). The FSC decided to follow development, review, and publication processes similar to those used for NCA4, with some changes intended to increase the transparency, engagement, and usability of NCA5. Details on the NCA4 assessment development process were outlined in NCA4’s Process Appendix³ and are not repeated here. Additional process changes for NCA5 are described below.

Broadened Participation

More than 750 experts volunteered as chapter leads, authors, technical contributors, and review editors in NCA5 (Figure A1.1), a significant increase in participation compared to previous Assessments. In response to public comments calling for more diverse author teams and inclusion of a broader range of expertise, the number of all-federal author teams was reduced to three chapters. With few exceptions, contributors were limited to serving in a single role (Table A1.1) to ensure that as many people as possible could participate in NCA5.

Authors of NCA5



Hundreds of experts from all across the US came together to develop NCA5.

Figure A1.1. NCA5 was made possible by approximately 500 authors, 250 technical contributors, 41 review editors, 13 chapter coordinators, 14 Federal Steering Committee members, 18 peer reviewers, more than 40 staff members, thousands of participants in public engagement events, hundreds of public commenters and agency reviewers, and approximately 800 artists from every state and territory of the US. This picture is a subset of authors, coordinators, and review editors who attended the second all-authors meeting in Washington, DC, on April 4, 2023. Photo credit: Christopher Avery, USGCRP/ICF.

Chapter leads (CLs) were provided with multiple criteria to consider when selecting their author teams. All authors were required to have the scientific expertise needed to contribute meaningfully to the chapter. CLs were required to consider nominees submitted through a public call for author nominations but were not limited to selecting authors from those nominees. Additionally, CLs were required to build diverse teams by considering a range of disciplines (physical, social, biological sciences, Indigenous Knowledge, science communication, etc.), a broad array of experience (practitioner, academic, etc.), and diverse lived experiences and perspectives, including geographic location, career stage, professional organization type, race, ethnicity, gender, and past assessment experience. Regional chapters were strongly encouraged to include authors from each state within the region. Authors and contributors to NCA5 included experts from all 50 states, Puerto Rico, the US Virgin Islands, Guam, and Palau.

Increased Public Engagement Opportunities

Public engagement seeks to help authors understand the interests and concerns of NCA readers and ensures that the final report represents the priorities and needs of decision-makers across the country. In addition to taking public comment on the draft Assessment in the fall of 2022, NCA5 featured a new opportunity for public comment on the chapter’s initial annotated outlines, or Zero Order Drafts.⁴ A “how-to” video and step-by-step guide were developed to facilitate the public comment process. During this public comment period (January and February 2022), USGCRP also hosted 34 virtual public engagement workshops that were free and open to the public (Figure A1.2). During the workshops, authors spoke with members of the public about the draft chapter outlines and identified priority issues relevant to the chapter.

In some cases, workshop participants challenged authors to reconsider the key topics covered in the report or shifted authors’ thinking about specific areas of emerging concern. In other cases, the workshops prompted authors to forge more connections across the report and with other chapter teams or identified where chapter teams had a gap in needed expertise.

NCA5 Zero Order Draft Public Engagement Workshops



Early public engagement helped inform the scope of NCA5.

Figure A1.2. The NCA5 Public Engagement Workshops attracted more than 7,000 registrations, with approximately 2,800 people participating via plenary discussions, breakout rooms, and interactive collaborative tools. The charts above show the self-identified organizational type (left) and region (right) of workshop registrants as the percentage of total registrants (not population weighted). For example, participants included more than 400 people who self-identified as being affiliated with a Tribe. Figure credit: USGCRP/ICF.

Updated Guidance to Better Incorporate Indigenous Knowledge

NCA5 leadership participated in three Tribal consultations and one Tribal listening session and took public input on the use of Indigenous Knowledge in federal decision-making.⁵ Based on feedback received during a public comment process for the federal guidance,⁶ the NCA guidance to authors on Information Quality was updated (see App. 2). Authors were also provided training on writing about Indigenous perspectives and using Indigenous Knowledge in author orientation and chapter leadership meetings.

Improved Diversity, Equity, Inclusion, Justice, and Accessibility

Beyond the steps listed above to ensure author diversity and widespread public engagement, NCA5 took several steps to improve the inclusive nature of the NCA development process, advance the conversation around equity and justice, and enhance accessibility of NCA5 products.

- For the first time, a [code of conduct](#) was instituted for all NCA participants to help ensure that all participants could engage in an inclusive, respectful, and safe environment.⁷
- Spanish translation was provided during the Caribbean public engagement workshop and of the draft Caribbean chapter released for public comment. For the first time, the entire Assessment report will be translated into Spanish.
- Throughout the report development process, USGCRP encouraged discussions around equity and justice topics. Authors were asked to consider the justice implications of climate change so as to make the report more broadly representative and inclusive of historically underrepresented communities.
- NCA5 represents the first time that the website for NCA is the report of record. As a result, this report was developed and designed to be delivered as a digital product. This website is designed to follow new standards of the US Web Design System⁸ under the 21st Century Integrated Digital Experience Act of 2018.⁹
- NCA5 built on the success of NCA4 in its compliance with Section 508 of the Rehabilitation Act of 1973 to improve accessibility and usability by the broadest possible audience, including people with visual or physical limitations. For instance, guidance was provided to authors to avoid complex or nested tables and alternative text was developed for all images to support the use of screen readers. Graphics are also designed to be readable for users with color-perception challenges by using appropriate color schemes and visual presentations.

Strengthened Documentation Processes

Based on laws (e.g., the Foundations for Evidence-Based Policymaking Act, or Evidence Act of 2018;¹⁰ see Appendix 2 for additional information) and transparency best practices that evolved since NCA4, processes for documenting multiple aspects of supporting materials were strengthened for NCA5. Authors were required to disclaim any intellectual property created in the process of producing this report to ensure that the report content could be released under the Creative Commons 1.0 Universal Public Domain Dedication (CC0 1.0). Additionally, NCA4's gold-standard process for metadata tracking and verification was improved, with software updates and a user manual to aid authors in their documentation process. Additional details on this process can be found in Appendix 2.

Creative Communications

Science communication support throughout the writing process was provided by the Technical Support Unit (TSU). Early author orientation and trainings emphasized TSU's data visualization and graphic design support for figure development, with the goal of including high-quality figures throughout NCA5 to convey important messages and supplement the text. The final report contains 388 figures.

USGCRP pursued several art–science collaborations throughout the NCA5 process. On October 11, 2022, USGCRP announced an [open call](#) for visual artwork. The call, which was open to youth and adults, invited works around the themes of NCA5 that depict climate change impacts and responses and that reflect the lived experience of people across the country. Five award winners and 92 finalists from the approximately 800 submissions received are featured in the [Art × Climate Gallery](#) and throughout the report.¹¹ Artwork that appears in chapters is denoted by a gray background and accompanied by the artist’s statement. In addition, USGCRP collaborated with the National Endowment for the Arts and the Library of Congress to include the bespoke poem “[Startlement](#),” written for NCA5 by the 24th US Poet Laureate, Ada Limón.

Accessible Climate Data

An interactive online atlas ([NCA5 Atlas](#)) was developed to provide additional resources for climate impact and resilience planning, with a selection of climate variables curated for each US region. These variables were produced using the same methodology as the downscaled precipitation and temperature projections used throughout NCA5 (App. 3). The Atlas includes interactive maps, plain language descriptions, and links to subregional climate products such as the NOAA State Climate Summaries and the USGCRP Climate Indicators (App. 4). The NCA5 Atlas was created through a collaboration between NOAA and ESRI (Environmental Systems Research Institute Inc.) that complemented other agency-supported planning initiatives, including the [Climate Explorer](#), the [Interagency Sea Level Rise Scenario Tool](#), and the [Climate Mapping for Resilience and Adaptation](#) portal.

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