

National Academies Resources, Activities, and Reports

Contents

- Thematic updates: Climate | [Artificial Intelligence](#) | [Biodiversity](#)
- Boards: [BECS](#) | [Climate Crossroads](#)

Theme: Climate

Upcoming events

[A Research Agenda Toward Atmospheric Methane Removal: Report Release Webinar](#)

October 2, 2024, 2-3pm ET

Methane is the second-most important greenhouse gas contributing to human-driven warming of the planet. Given the urgent need to limit warming, researchers are beginning to explore the concept of atmospheric methane removal. Join the National Academies for a webinar on the release of a new report, "A Research Agenda Towards Atmospheric Methane Removal," on October 2, 2024 from 2pm to 3pm ET. Members of the study committee will share key takeaways on the need and potential for atmospheric methane removal and priority research recommendations to improve understanding.

[Leveraging the National Climate Assessment to Empower Communities \(New Voices in Sciences, Engineering, and Medicine\)](#)

October 9, 2024

The goal for this workshop is to contribute towards the ongoing efforts to broaden the reach of the NCA, with a focus on community engagement to enhance the impact and application of the report findings at local and regional levels. The workshop will explore best practices and opportunities for community engagement at various stages of the NCA development as well as dissemination process. Workshop participants will also share tangible examples of how the findings of the NCA are effectively being communicated and applied at local levels to benefit climate vulnerable communities.

Current Consensus Studies

[Atmospheric Methane Removal Development of a Research Agenda](#) (BASC; BCST; BEES)

This study will consider the need and viable options for atmospheric methane removal--one category of "negative emissions technologies" currently being explored as part of efforts to achieve net-zero greenhouse gas emissions. The committee will examine opportunities, risks, and co-benefits of different atmospheric methane removal approaches and make recommendations for new research that would improve understanding of these technologies and their implications. [Status: Report release October 2]

[Attribution of Extreme Weather and Climate Events and their Impacts](#) (BASC)

Event attribution seeks to tease out the influence of human-caused climate change on specific weather and climate events. This study will update and expand on the 2016 National Academies report, [Attribution of Extreme Weather Events in the Context of Climate Change](#), by considering current scientific understanding and capabilities for extreme event attribution. The committee will identify research priorities to advance event attribution capabilities, consider ways to extend attribution science to data-limited regions, and provide guidance for engaging stakeholders with the findings of attribution science. [Status: in progress]

State-of-the-Science and the Future of Cumulative Impact Assessment (BECS/BEST/BPHPHP)

Using an interdisciplinary approach, this work will explore the state-of-the-science of cumulative impact assessment and its application at the community, state, and national levels. The work will entail public workshops, community and tribal engagement, and a broad array of consulted scientific expertise. It will build from prior National Academies reports highlighting the need to better characterize and manage cumulative exposures, health risks, and other impacts experienced in diverse populations. [Status: In progress]

Keywords: cumulative impact, environmental stressors, methods, community / tribal data

Education for Thriving in a Changing Climate (BOSE)

Education at all levels and settings plays an essential role in supporting flexible and proactive responses to these challenges. However, education will need to go beyond understanding the science behind climate change to help people make decisions and identify the individual and collective actions needed to ensure that individuals and communities can continue to thrive. The project will provide guidance for education stakeholders around the country related to supporting individuals and communities as the reality of climate change emerges.

[Status: Initiating]

Keywords: science education, climate change, environmental education and environmental justice, sustainability, civic engagement, conservation

Global Forced Migration and U.S. Resettlement (CPOP)

This study will review and assess the current state of knowledge regarding the resettlement and incorporation of forced migrants in the United States, identify knowledge gaps, propose an agenda for research and data collection, and discuss implications for policies and programs. [Status: In progress]

Keywords: migration, policy, research agenda

Recently Released Reports and Proceedings

Reports

Modernizing Probable Maximum Precipitation Estimation (BASC/WSTB)

[Report](#) | [Highlights](#)

Modernizing Probable Maximum Precipitation Estimation recommends a new definition of PMP and presents a vision for a methodology relevant for design, operation, and regulation of critical infrastructure. Near-term enhancements to PMP include improved data collection, model-based storm reconstructions, and strengthened scientific grounding for PMP methods. Long-term model-based PMP estimation will employ kilometer-scale climate models capable of resolving PMP storms and producing PMP-magnitude precipitation. A Model Evaluation Project will provide scientific grounding for model-based PMP estimation and determine when transition to a model-based PMP estimation should occur.

Keywords: extreme precipitation, non-stationarity, uncertainty, climate modeling, infrastructure safety

Developing a Strategy to Evaluate the 5th National Climate Assessment (BASC/BECS/CNSTAT)

[Report](#)

An ad-hoc committee was tasked with designing a strategy for evaluating stakeholder use of the National Climate Assessment and select other USGCRP products designed to help determine the extent to which these products meet the needs of stakeholders to support decision-making. To support evaluation of stakeholder use of the NCA, the National Academies prepared a strategy for creating and implementing an evaluation design that can inform ongoing and future NCAs and related products. This can support a process of continuous improvement.

Keywords: evaluation, climate change, scientific assessment, stakeholders, data useability

Addressing Climate Resilience and Greenhouse Gases in the Transportation Planning Process (TRB)

Report

Many state departments of transportation (DOTs) are undergoing organizational changes to address climate change. Changes range from hiring additional staff to creating new offices within the organizational structure of the agency. State requirements in the form of legislation, executive orders, and climate action plans are primary drivers for state DOT involvement with climate change. This report, from TRB's National Cooperative Highway Research Program, documents practices and procedures at state DOTs regarding climate change. Supplemental to the report is [Appendix C](#), a compilation of weblinks to state climate change documents.

Keywords: infrastructure, resilience, climate change

Proceedings

Advancing Risk Communication with Decision-Makers for Extreme Tropical Cyclones (BASC/BECS)

This workshop explored opportunities and challenges for communicating with decision-makers about extreme tropical cyclones and identify lessons that can be drawn from engagement and communication concerning other hazards and applied to the tropical cyclone context. [Status: Proceedings forthcoming]

Keywords: weather, risk, risk communication, tropical cyclones, hazards

The Social-Ecological Consequences of Future Wildfire in the West: A Workshop (BECS/BANR)

This workshop focused on understanding and responding to increasing fire size, severity, and frequency since the 1970s. The workshop also covered policy/practice considerations, research/data needs, and community engagement strategies as it seeks to identify gaps in knowledge, the value of filling those gaps, strategies for doing so, and what disciplines must work together.

Keywords: wildfire, community engagement, decision making

Public Infrastructure for Effective Climate Mitigation and Adaptation: A Workshop (BECS)

Proceedings

The Board on Environmental Change and Society of the National Academies of Sciences, Engineering, and Medicine convened a workshop in May 2024, devoted to the role of public infrastructure in effective climate mitigation and adaptation. This publication summarizes the presentations and discussion of the workshop.

Keywords: infrastructure, climate mitigation, climate adaptation

The Dynamics of Climate and the Macroeconomy: A Workshop (BASC/BECS)

Proceedings

Understanding the intricate relationship between climate dynamics and the macroeconomy is crucial for informed policy and long-term planning. However, there is a gap between climate modeling and the understanding of its full macroeconomic effects, partly due to challenges such as nonlinear climate dynamics, feedback loops, and model complexity. To address this, the National Academies of Sciences, Engineering, and Medicine, under the auspices of the Roundtable on Macroeconomics and Climate-Related Risks and Opportunities, convened a workshop to consider the state of knowledge on cascading, compounding, and nonlinear physical climate risks and their implications for the macroeconomy.

Keywords: economics, climate, climate risks

Theme: Artificial Intelligence

National Academies Press report collection: [Artificial Intelligence and Climate Change](#)

Current activities

- [Human and Organizational Factors in AI Risk Management: A Workshop](#) (CSTB; BOHSI; Proceedings in brief forthcoming)
- [Using Machine Learning in Safety-Critical Applications: Setting a Research Agenda](#) (CSTB)
- [Automation and the U.S. Workforce: An Update](#) (CSTB)

Upcoming events

- November 12-13, 2024: [Implications of Artificial Intelligence-Related Data Center Electricity Use and Emissions](#) (Roundtable on Artificial Intelligence and Climate; BEES; CSTB)
- January 28-29, 2025; [Gilbert W. Beebe Symposium on AI and ML Applications in Radiation Therapy, Medical Diagnostics, and Radiation Occupational Health and Safety](#) (NRSB; HMD; BOHSI)

Reports and Recent Activities

AI in the US Federal Government

- [AI Day for Federal Statistics: CNSTAT Public Event](#) (2 May 2024) DBASSE/CNSTAT

AI for discovery

- [AI for Scientific Discovery: Proceedings of a Workshop](#) (2024) PGA/Capacity; DEPS/CSTB

AI and Decision-making, Trustworthiness, and Confidence

- [Assessing and Improving AI Trustworthiness: Current Contexts and Concerns](#) (2021) CSTB
- [Artificial Intelligence and Justified Confidence](#) (2023) BOARD; CSTB
- [Human-AI Teaming: State-of-the-Art and Research Needs](#) (2022) BOHSI
- [Navigating the Era of Artificial Intelligence: Achieving Human-AI Harmony](#) [May 23, 2024] DBASSE/BOHSI
- [Fostering Responsible Computing Research: Foundations and Practices](#) (2022) CSTB

AI for Modeling and Analysis

- [Machine Learning and Artificial Intelligence to Advance Earth System Science: Opportunities and Challenges](#) (2022) BASC; BESR; OSB; BMSA; CSTB
- [Enabling US Leadership in Artificial Intelligence for Weather](#) [session recording] (2024) BASC
- [Opportunities and Challenges for Digital Twins in Atmospheric and Climate Sciences](#) (2023) BMSA; CSTB; BASCPR; BLS

Social Sciences

- [Navigating the Era of Artificial Intelligence: The Role of Social Sciences](#) [July 25, 2024 panel] DBASSE/BOHSI
- [AI for the Rest of Us: How Equitable Is the Future of Work for Front-Line Workers?](#) [April, 2024] BOHSI
- [Navigating the AI Landscape: Strategies for State and Local Leaders](#) [April 9, 2024] DBASSE/SEAN/BOHSI
- [AI Peer-to-Peer Series Balancing AI Benefits and Risks](#) [May and August, 2024] DBASSE/SEAN/BOHSI
- [Creating an Equitable Future of Work: Industry's Preparation for an AI World](#) [August, 2024] BOHSI

Cybersecurity

- [Large Language Models and Cybersecurity: Proceedings of a Workshop—in Brief](#) (CSTB, 2024)

Life Sciences (BLS)

Current Activities

- [Assessing and Navigating Biosecurity Concerns and Benefits of Artificial Intelligence Use in the Life Sciences](#)
- [Biotechnology Capabilities for National Security Needs--Leveraging Advances in Transdisciplinary Biotechnology](#)

Reports

- [Artificial Intelligence and Automated Laboratories for Biotechnology: Leveraging Opportunities and Mitigating Risks: Proceedings of a Workshop—in Brief](#)
- [Engaging Scientists to Prevent Harmful Exploitation of Advanced Data Analytics and Biological Data: Proceedings of a Workshop—in Brief](#)
- [Advances in Multimodal Artificial Intelligence to Enhance Environmental and Biomedical Data Integration: Proceedings of a Workshop—in Brief \(2023\)](#)
- [Leveraging Artificial Intelligence and Machine Learning to Advance Environmental Health Research and Decisions: Proceedings of a Workshop—in Brief \(2019\)](#)

Theme: Biodiversity

Current activities: Consensus studies

- [A Vision for Continental Scale Biology: Research Across Multiple Scales](#). Expected report release: mid-October 2024. [Boards: [BEST](#) and [BLS](#)]
- [Review of Draft Chapters of the Biodiversity and Climate Change Assessment](#). The National Academies will conduct this review concurrent with public comment period, with expected start end of September and report release spring 2025 [Boards: [BEST](#), staffed by [BASC](#)]

Reports and Recent Activities

Biodiversity at Risk Today's Choices Matter: [Booklet](#) and [interactive website](#) [led by BLS but cross-DELS activity]

[Cross-Cutting Themes for U.S. Contributions to the UN Ocean Decade](#). This report by the Ocean Studies Board, which serves as the US National Committee for the Ocean Decade, highlights six themes for the decade, two themes address marine biodiversity. [Board: [OSB](#)]

- restoration and conservation of marine ecosystems
- detection and monitoring through development and application of eDNA and acoustic techniques

The Committee on [Interventions to Increase the Resilience of Coral Reefs](#) produced two reports in 2019. [Board: [OSB](#)]

- [A Research Review of Interventions to Increase the Persistence and Resilience of Coral Reefs](#) (2019)
- [A Decision Framework for Interventions to Increase the Persistence and Resilience of Coral Reefs](#) (2019)

Board on Environmental Change and Society (BECS) / DBASSE

Public Infrastructure for Effective Climate Mitigation and Adaptation. Proceedings of a Workshop—in Brief (2024)

The Board on Environmental Change and Society of the National Academies of Sciences, Engineering, and Medicine convened a workshop in May 2024, devoted to the role of public infrastructure in effective climate mitigation and adaptation. This publication summarizes the presentations and discussion of the workshop. [Public Infrastructure for Effective Climate Mitigation and Adaptation: Proceedings of a Workshop—in Brief](#)

Developing and Assessing Ideas for Social and Behavioral Research to Speed Efficient and Equitable Industrial Decarbonization. Proceedings of a Workshop. (2024)

Interest in decarbonizing various sectors of the U.S. economy has produced a rich body of scholarly research, policy studies, and practitioner reports on technology pathways and scenarios, with a particular focus on the power sector, vehicles, and buildings. The research on nontechnological issues associated with decarbonization is much sparser in general, and this is particularly true for the difficult-to-decarbonize industrial sector. In February 2024, the National Academies of Sciences, Engineering, and Medicine hosted a public workshop designed to inform the development of ideas for a national interdisciplinary social sciences research agenda relating to an efficient and equitable clean energy transition in the U.S. industrial sector. The workshop planning committee solicited and commissioned several papers aimed at outlining key societal challenges and needs that require social science insights and tools to build a social compact for industrial decarbonization. At the workshop, an interdisciplinary group of social scientists, engineers, community groups, and experts from industry and government explored the social science research needs on these issues. The proceedings of the workshop describes the presentations and discussions.

[Developing and Assessing Ideas for Social and Behavioral Research to Speed Efficient and Equitable Industrial Decarbonization: Proceedings of a Workshop](#)

Community Driven Relocation: Recommendations for the U.S. Gulf Coast Region and Beyond.

New resources on the National Academies Press page include:

1. [Highlights](#)
2. [Federal Policy Brief](#)
3. [Non-Federal Policy Brief](#)
4. [Research Policy Brief](#)
5. [Interactive Overview](#)
6. [Highlights - Spanish](#)
7. [Highlights - Vietnamese](#)

Advancing United States-Mexico Binational Sustainability Partnerships. Article published in the Summer issue of *Issues in Science and Technology* chronicles a decade-long collaboration between the US and Mexican Academies of Science. <https://issues.org/nasem-amc-binational-journey-sustainability/>

Why Is This Important? The US-Mexico border is more than just a political line—it's a complex landscape shared by two nations, marked by shared climate and environmental challenges, yet divided by different cultures, languages, and policies. As this region undergoes social, political, and environmental transitions, it demands innovative, interdisciplinary approaches to sustainability.

A Decade of Collaboration. This publication details a unique partnership to bridge the gap in addressing sustainability challenges in the US-Mexico transboundary region. By addressing sustainability challenges together, this partnership sets a precedent for other regions facing similar issues.

NATIONAL
ACADEMIES

Sciences
Engineering
Medicine

Climate Crossroads

Background for the Committee to Advise the U.S. Global Change Research Program – *September 2024*

Amanda Staudt, Senior Director

Amanda Purcell, Associate Director

1



Climate Crossroads

Launched in 2023, Climate Crossroads is the National Academies' sustained and comprehensive approach to tackling climate change by:

- harnessing the breadth of the National Academies expertise to identify and accelerate actions to address the climate crisis, and
- reaching new audiences and building durable partnerships to work together towards a just, prosperous, and sustainable environment and society.

NATIONAL
ACADEMIES

Sciences
Engineering
Medicine

4

National Academies' Hybrid Approach for CCX

Expanding Coordination and Engagement Capacities built on strong foundation of existing capabilities

LEADERSHIP, ADVICE, & COORDINATION

FUNDRAISING & DEVELOPMENT

COMMUNICATIONS & ENGAGEMENT

CONGRESSIONAL ENGAGEMENT

INTERNATIONAL ENGAGEMENT

COMMUNITIES, EQUITY, JUSTICE

X

Enabling Collaborative Development for Transdisciplinary Activities by enhancing existing and enabling new work

Accelerating Decarbonization

NAM Grand Challenge: Climate, Health, & Equity

Cultivating Climate-Resilient Communities

Ensuring Thriving Natural Systems

AI & Climate Change

Higher Education Institutions for Climate Action

Enhancing existing efforts

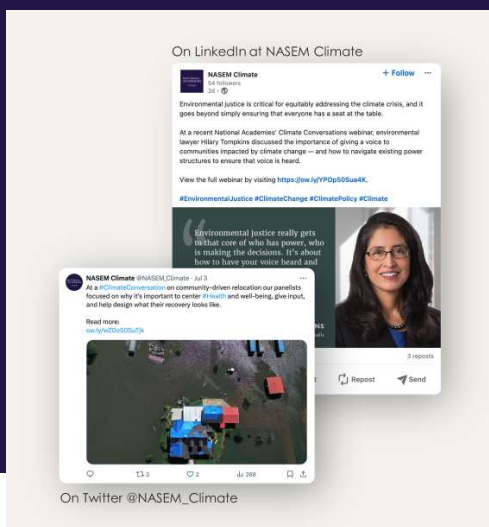
Supporting Pathways to Action

Supporting collaborative project development

NATIONAL ACADEMIES
Sciences
Engineering
Medicine

5

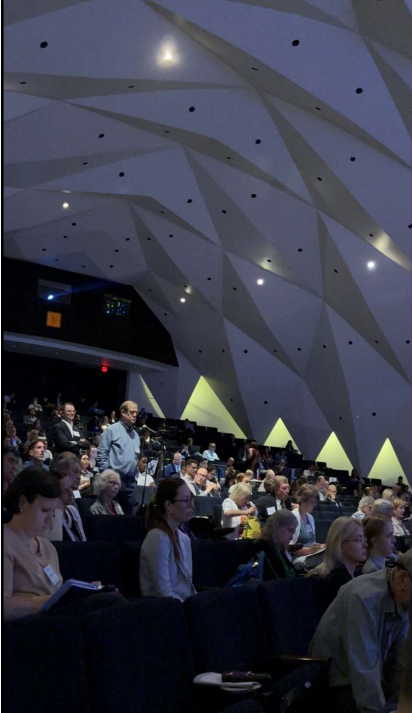
Communications & Engagement Activities



- **Climate at the National Academies weekly newsletter** (20K+ subscribers) & social channels: **NASEM Climate** LinkedIn showcase and **@NASEM_Climate** on X/Twitter
- **Climate Conversations monthly webinar series** convenes high-level, cross-cutting, nonpartisan conversations (**37 events featuring 109 experts** with more than **79,000 views**)
- **Climate Crossroads Congressional Fellowship** provides current Congressional staff with a solid grounding in the science, engineering, and health dimensions of climate change.
- **Annual Climate Crossroads Summit** to engage experts, community stakeholders, and decision makers on current and emerging pathways to meet the climate

6

6



Climate Crossroads Summit

July 16-17, 2024

The 2024 Climate Crossroads Summit engaged experts, community stakeholders, and decision makers on current and emerging pathways to meet the climate crisis. [\[View Recordings\]](#)

- 22 concurrent sessions planned in partnership with 82 NASEM staff from 21 boards/units
- ~3,500 registrants; approx. 450 in-person & 2,000 virtual attendees

7

Climate Crossroads Congressional Fellowship

Program Goals:

1. **Build capacity for science-based policy making**, through a 9-month training and networking experience for a bi-partisan annual cohort of Crossroads Fellows.
2. **Sustain bipartisan science-policy community** among peers who share the common interest of addressing climate change.
3. **Enhance policy maker access to leading science, engineering, and medicine**, by leveraging the breadth of the National Academies' reports, events, expertise, and networks.



13

Climate Crossroads Congressional Fellowship

Year 1 (2023-24) achievements:

- **Inaugural cohort (31 fellows) has broad representation:** both chambers; range of committees, regions, career stages, and roles; and views across political spectrum
- **Development of ~12 curriculum modules,** engaging >35 invited experts and >20 NASEM staff from 5 divisions
- **Successful weekend seminar trip** to the Eastern Shore of Maryland in mid-March, including field trips to Cambridge living shoreline and Horn Point laboratory

Year 2: [2024-25 Fellows Announced!](#)



14

**NATIONAL
ACADEMIES** Sciences
Engineering
Medicine

Amanda Staudt
Climate Crossroads Senior Director
astaudt@nas.edu

Amanda Purcell
Climate Crossroads Associate Director
apurcell@nas.edu

16