U.S. Global Change Research Program

FIFTH NATIONAL CLIMATE ASSESSMENT

Allison Crimmins, Director of the National Climate Assessment, USGCRP/OSTP

11/29/23

U.S. Global Change Research Program

The U.S. Global Change Research Program (USGCRP) was mandated by Congress in the Global Change Research Act of 1990 (P.L. 101-606), “to assist the Nation and the world to **understand**, **assess**, **predict** and **respond** to human-induced and natural process of global change”

Legislative Origins for the National Climate Assessment

Global Change Research Act of 1990, Section 106:

Not less frequently than every 4 years [USGCRP] shall prepare and submit to the President and Congress an assessment which:

- **Integrates, evaluates, and interprets** the findings of [USGCRP] and discusses the scientific **uncertainties** associated with such findings
- Analyzes 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**
- Analyzes **current trends** in global change, both human- induced and natural, and **projects major trends** for the subsequent 25 to 100 years

National Climate Assessment Basics

- **Evaluates** a wide range of scientific and technical inputs from diverse and authoritative sources. **Applies best expert judgment** to characterize certainty.
- **Relevant for policy** and decision-making but **does not prescribe** specific policy interventions or advocate for a particular viewpoint.
- Assesses a **range of potential impacts**, helping decision-makers better identify risks that could be avoided or reduced
- Fully **compliant** with the Global Change Research Act (GCRA) and other applicable laws and policies
- Provides multiple opportunities for **public engagement**
- Employs an **extensive review** process

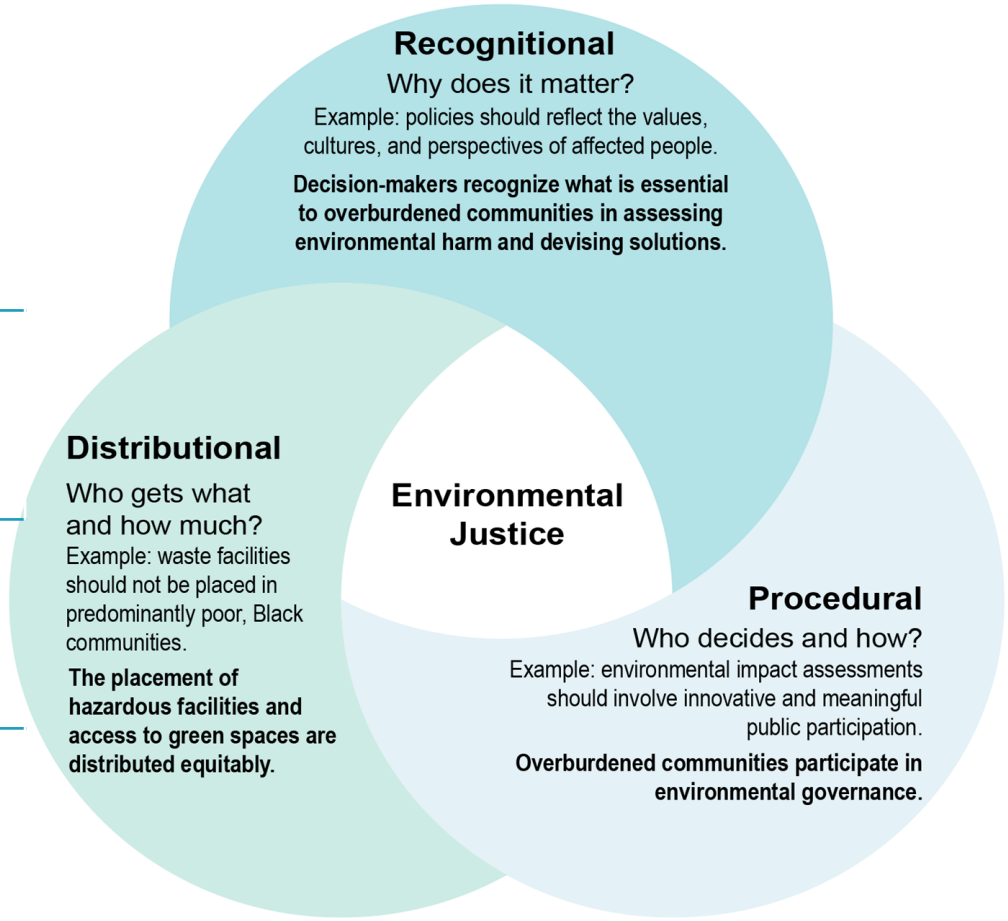
Scientific Advancements

Advancements in our understanding of observed and projected climate change (e.g., narrowed climate sensitivity; extreme event attribution)

Featuring two new chapters, one on Economics and one on Social Systems and Justice

Exploring themes of environmental justice and equity across the entire Assessment

Highlighting local and state climate mitigation and adaptation actions



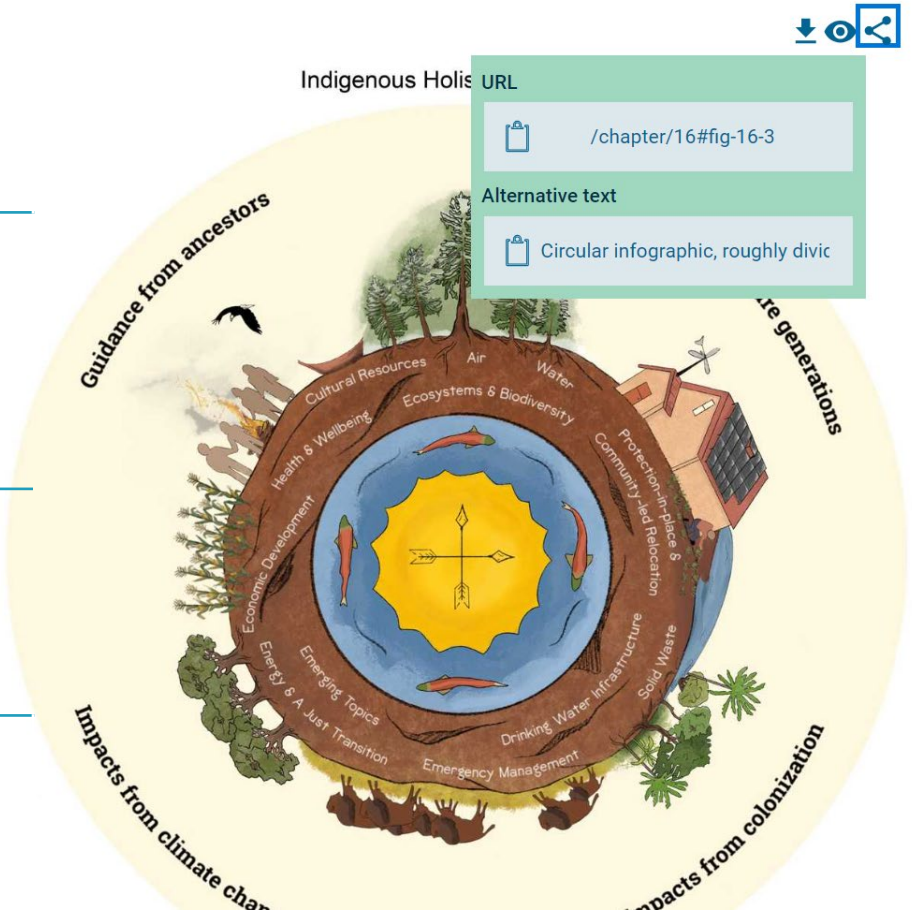
Process and Structure

Broadened participation and more public engagement opportunities

Stronger documentation requirements and updated information quality guidance with source-specific considerations for inclusion (e.g., Indigenous Knowledge)

Improving accessibility and functionality (e.g., alt text for all figures, improved search function, Spanish translation)

Expanded representation of regions outside of the contiguous U.S. across Assessment figures (still room for improvement!)



Creative Communication

NCA's first-ever call for visual art, "Art x Climate," received more than 800 submissions; 92 pieces were selected for inclusion in the Assessment

NCA5 includes the poem "Startlement," written for the Assessment by the 24th US Poet Laureate Ada Limón

Six podcast episodes featuring interviews with authors, artists, and staff

Recorded "audiobook" reading of the Overview chapter (executive summary)

TAMMY WEST
KEEP IT TOGETHER
(*2021, site-specific installation*)

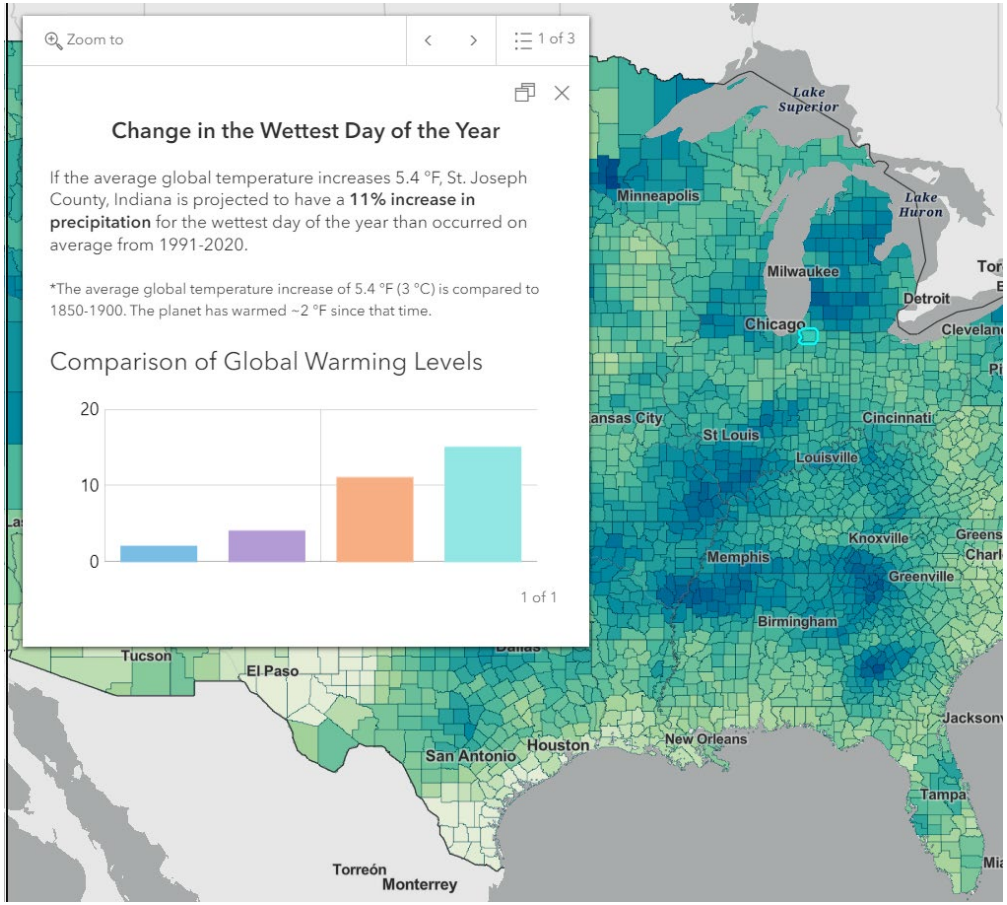
NCA Atlas (atlas.globalchange.gov)

A digital data viewer developed as an extension of the NCA5 text and figures

Atlas variables were produced with the same methodology as the downscaled climate data in NCA5

Interactive features allow users to generate and download their own regional and local maps

Users can select from a range of global warming levels or scenarios/ time periods, and impact-relevant climate variables (e.g., “days over 95°F”)



NCA5 Table of Contents

- Overview
- Climate Trends
- Earth System Processes
- Water
- Energy
- Land Cover and Land Use
- Forests
- Ecosystems and Biodiversity
- Coastal Effects
- Oceans and Marine Resources
- Agriculture
- Built Environment
- Transportation
- Air Quality
- Human Health
- Tribes and Indigenous Peoples
- International
- Complex Systems
- Economics
- Social Systems and Justice
- Northeast
- Southeast
- U.S. Caribbean
- Midwest
- Northern Great Plains
- Southern Great Plains
- Northwest
- Southwest
- Alaska
- Hawai'i and U.S.-Affiliated Pacific Islands
- Adaptation
- Mitigation

Focus on…

- Compound Extreme Events
- Western Wildfires
- COVID-19
- Supply Chains
- Blue Carbon

Appendices

- Process
- IQA
- Data Tools
- Indicators

✱ New chapters or features highlighted in blue

Key Takeaways from NCA5

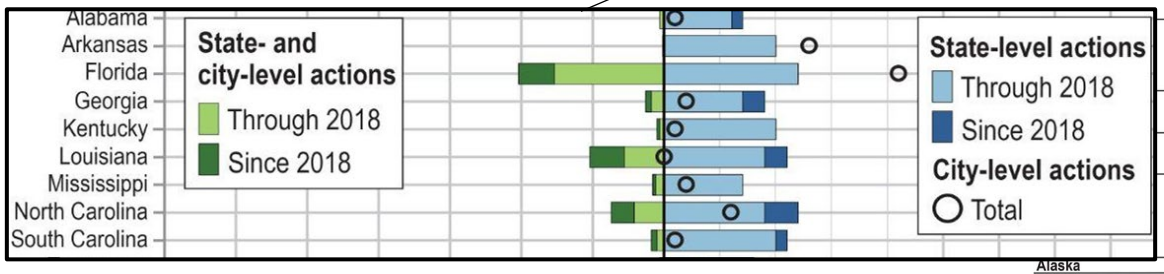
1. The United States is taking action on climate change
2. People in the United States are experiencing increased risks from extreme events
3. Climate change exacerbates social inequities
4. Available mitigation strategies can deliver substantial emissions reductions, but additional options are needed to reach net zero
5. Climate action is an opportunity to create a more resilient and just nation

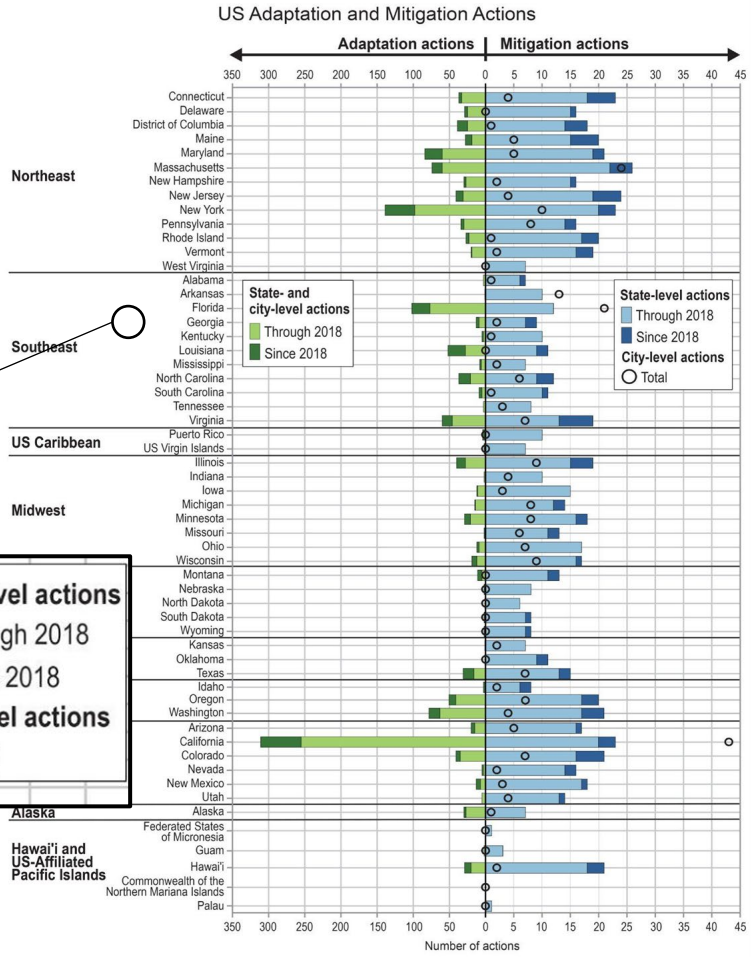
KEY TAKEAWAY 1

The United States is Taking Action on Climate Change

Since 2007, U.S. emissions have fallen and U.S. energy and emissions intensity have decreased—all while population and GDP have grown

Since 2018, city- and state-level adaptation plans and actions increased by 32%, complemented by a 14% increase in the total number of new state-level mitigation activities





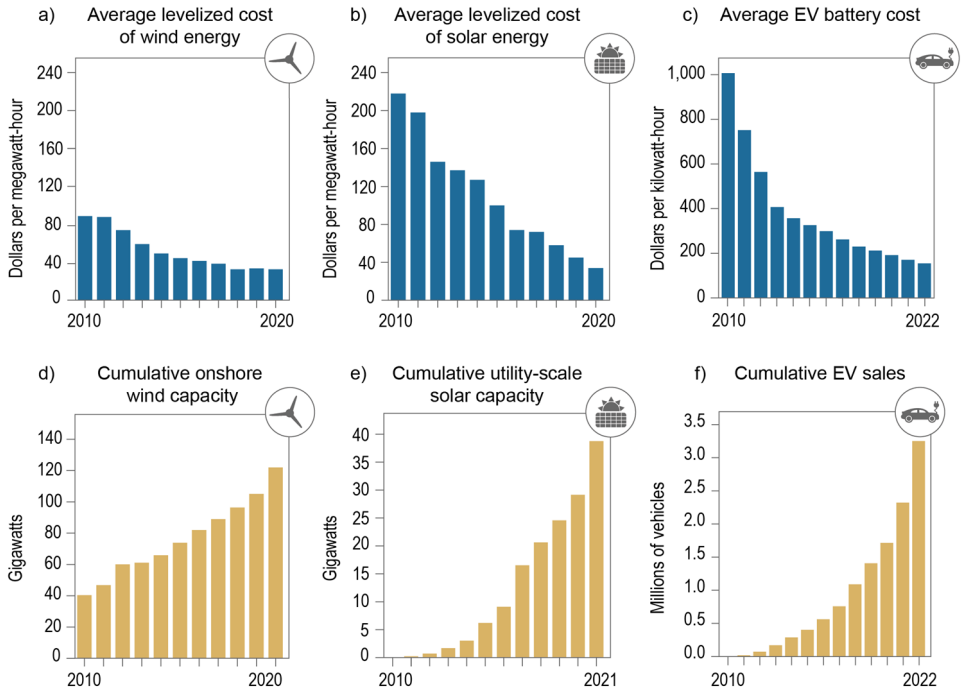
KEY TAKEAWAY 1

The United States is Taking Action on Climate Change

Recent growth in renewable capacities is supported by rapidly falling costs of zero- and low-carbon energy technologies, which can support even deeper emissions reductions

Recent legislation is expected to increase deployment of low- and zero-carbon technology

Historical Trends in the Unit Costs and Deployment of Low-Carbon Energy Technologies in the United States



Increasing capacities and decreasing costs of low-carbon energy technologies are supporting efforts to further reduce emissions.

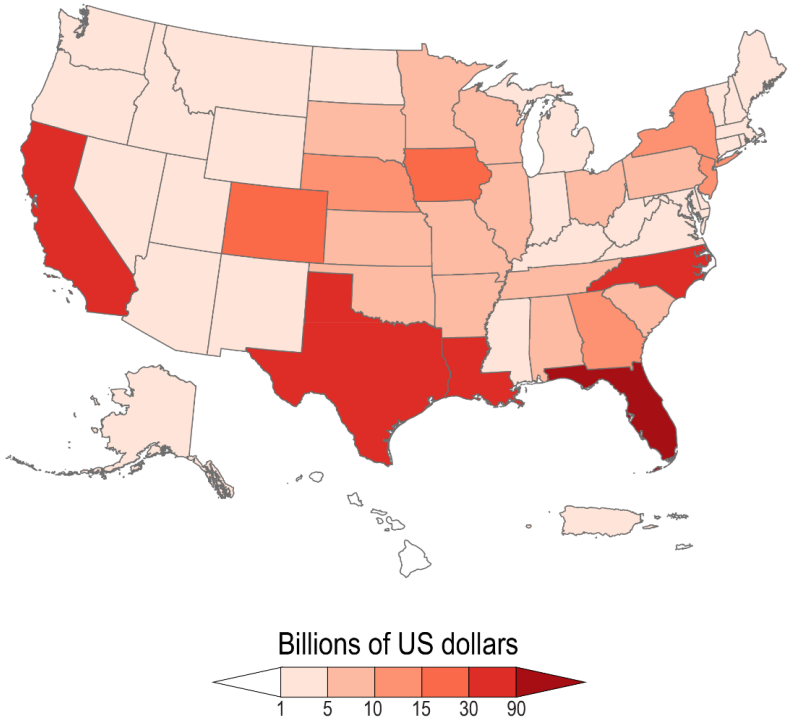
KEY TAKEAWAY 2

People in the U.S. Are Experiencing Increased Risks from Extreme Events

In the 1980s, the United States experienced one (inflation-adjusted) billion-dollar disaster every four months, on average; now, there is one every three weeks

Climate disasters that occur in one region of the United States can have cascading or compounding effects in other regions.

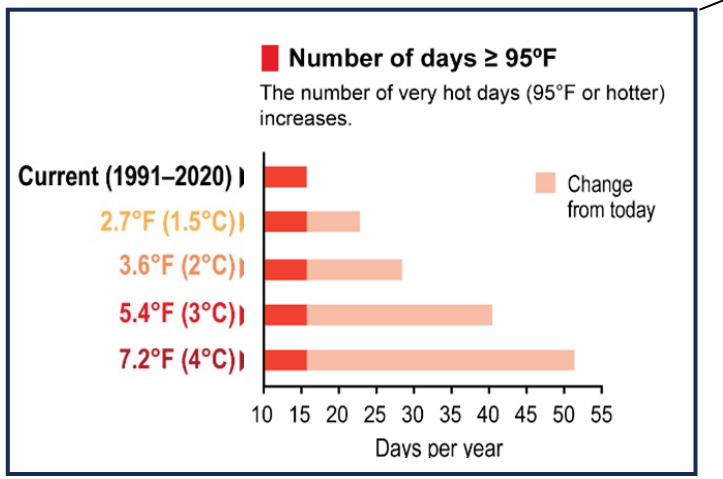
Damages by State from Billion-Dollar Disasters in the United States (2018–2022)

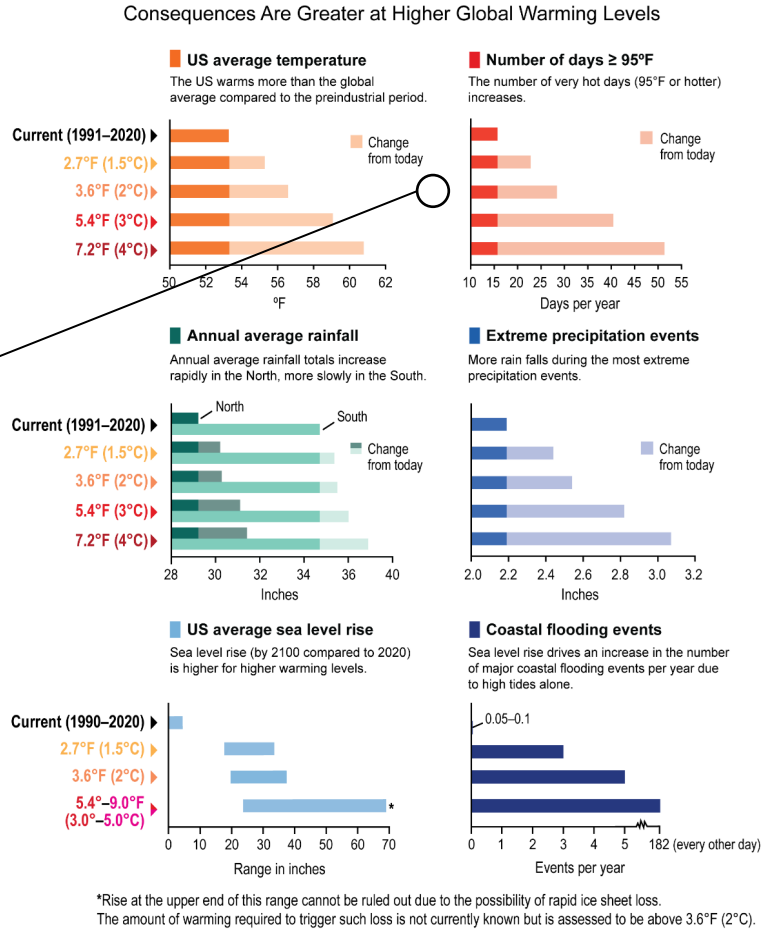


KEY TAKEAWAY 2

People in the U.S. Are Experiencing Increased Risks from Extreme Events

Each additional increment of global warming is expected to lead to more damage and greater economic losses; at the same time, each avoided increment of warming will reduce risks and harmful impacts

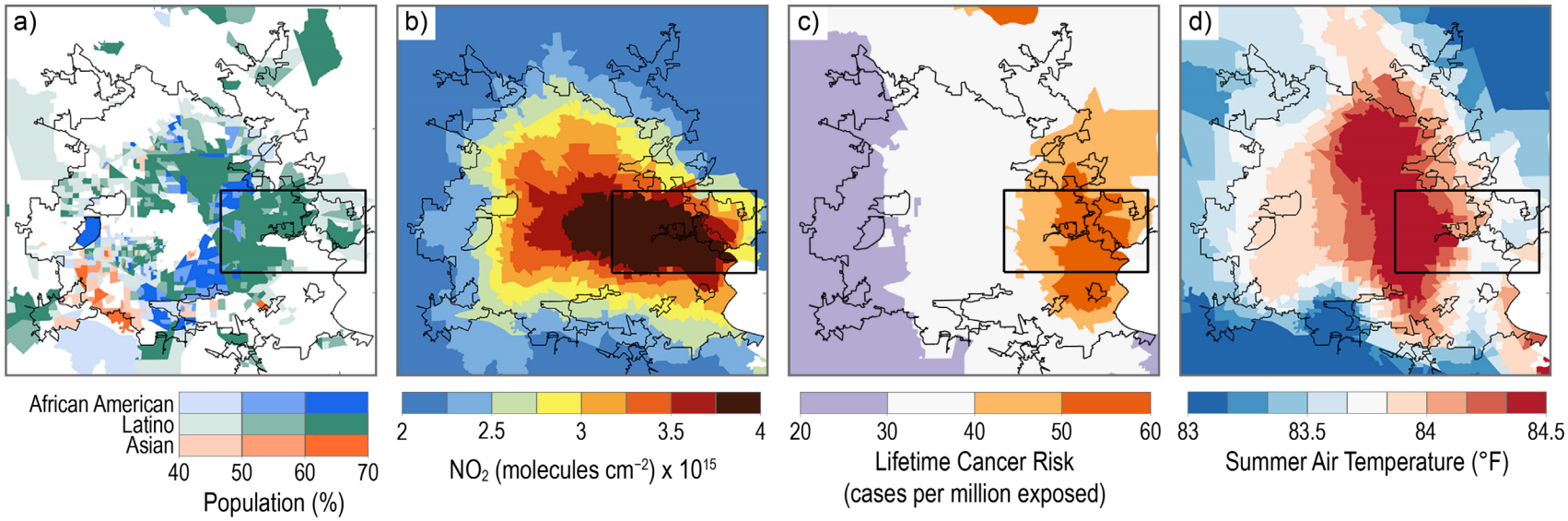




KEY TAKEAWAY 3

Climate Change Exacerbates Social Inequities

Air Pollution and Temperature Inequalities in Houston, Texas



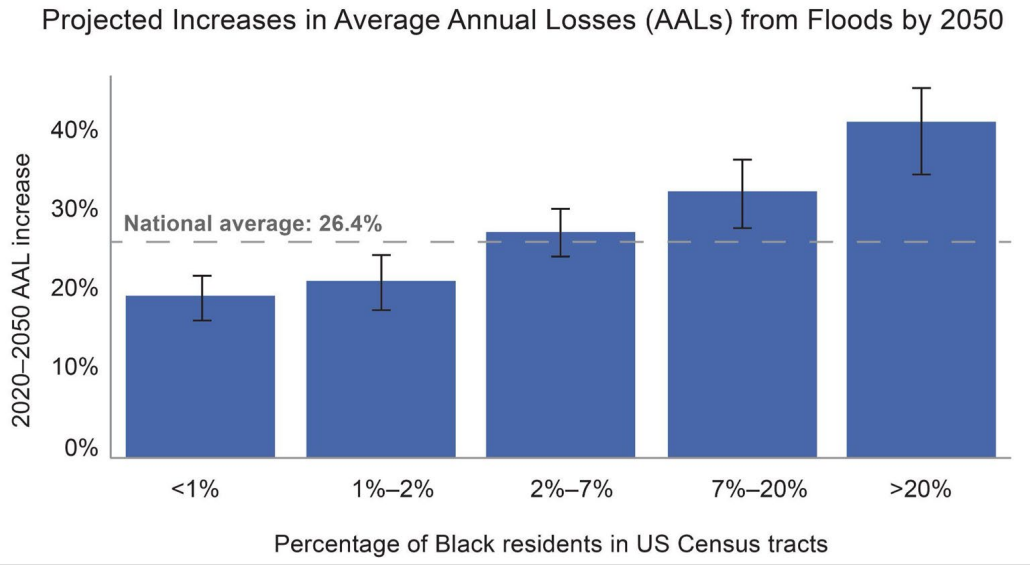
Underserved and overburdened communities face disproportionate risks and impacts from climate change, which exacerbates social and economic inequities and contributes to persistent disparities in the resources needed to prepare for, respond to, and recover from climate impacts

KEY TAKEAWAY 3

Climate Change Exacerbates Social Inequities

Neighborhoods that are home to racial minorities and low-income residents have the highest inland (riverine) flood exposures in the South

Black communities nationwide are expected to experience a disproportionate share of future flood damages

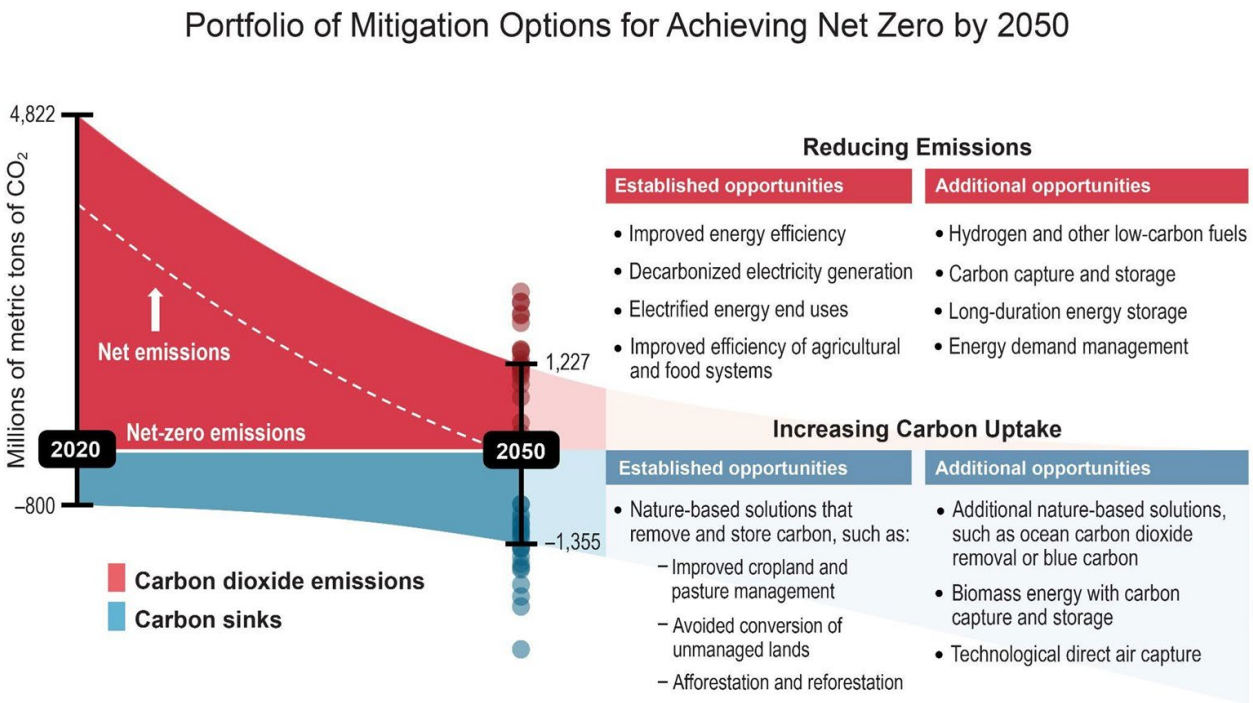


KEY TAKEAWAY 4

Available Mitigation Strategies Can Deliver Substantial Emissions Reductions, But Additional Options are Needed to Reach Net Zero

Limiting global warming to 1.5°C (2.7°F) above preindustrial levels requires a path to net-zero GHG emissions in the US by 2050

Net-zero emissions pathways require widespread implementation of currently available and cost-effective options for reducing emissions alongside rapid expansion of technologies and methods to remove carbon from the atmosphere to balance remaining emissions



KEY TAKEAWAY 4

Available Mitigation Strategies Can Deliver Substantial Emissions Reductions, But Additional Options are Needed to Reach Net Zero

While adaptation planning and implementation have advanced in the United States, most adaptation actions have been incremental in scale

In many cases, transformative adaptation will be necessary to adequately address the risks of current and future climate change

Transformative climate actions can strengthen resilience and advance equity

Table 1.3. Incremental Versus Transformative Adaptation Approaches

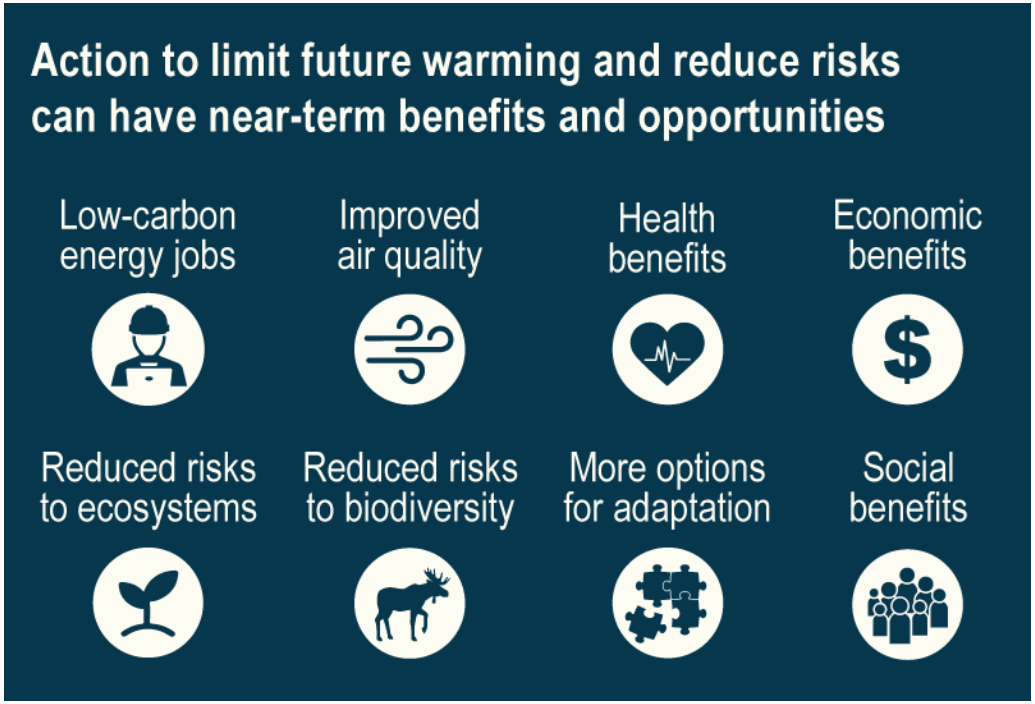
	Examples of incremental adaptation	Examples of transformative adaptation
	Using air-conditioning during heatwaves	Redesigning cities and buildings to address heat
	Reducing water consumption during droughts	Shifting water-intensive industry to match projected rainfall patterns
	Elevating homes above flood waters	Directing new housing development to less flood-prone areas

KEY TAKEAWAY 5

Climate Action is an Opportunity to Create a More Resilient and Just Nation

Actions taken now to accelerate net emissions reductions and adapt to ongoing changes can reduce risks to current and future generations

Climate action can result in a range of near-term benefits that outweigh the costs, with the potential to improve well-being, strengthen resilience, benefit the economy, and, in part, redress legacies of racism and injustice



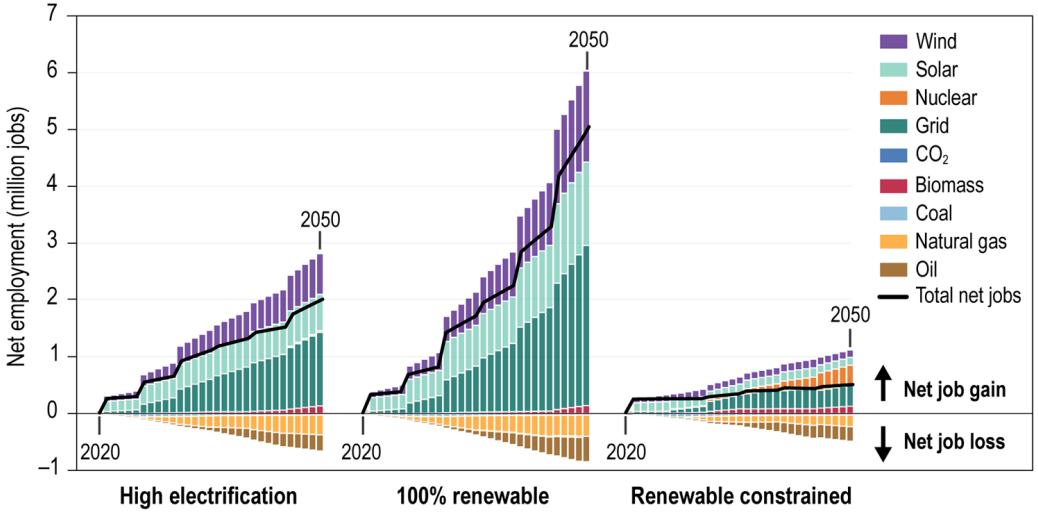
KEY TAKEAWAY 5

Climate Action is an Opportunity to Create a More Resilient and Just Nation

A “just transition” is the process of responding to climate change with transformative actions that address the root causes of climate vulnerability while ensuring equitable access to:

- jobs;
- affordable, low-carbon energy;
- environmental benefits such as reduced air pollution; and
- quality of life for all

Energy Employment (2020–2050) for Alternative Net-Zero Pathways



Effective and just transitions require reducing impacts to overburdened communities, increasing resources to underserved communities, and integrating diverse worldviews, cultures, experiences, and capacities into mitigation and adaptation actions

NCA5 Resources

NCA5 website: nca2023.globalchange.gov

- Downloadable and shareable figures
- Downloadable slides for each chapter
- 2-3 page chapter summaries
- Art x Climate gallery
- Ada Limón's poem, "Startlement"
- NCA5 Glossary

USGCRP website: globalchange.gov

- Six podcast episodes
- Audiobook recording of NCA5 Overview chapter
- List of webinar series dates, times, and links

NCA5 Atlas: atlas.globalchange.gov

- Interactive online tool that allows users to explore different scenarios and climate variables to highlight local climate projections
- Additional features to be added (e.g., sea level rise scenarios, storymaps)

WEBINARS

FIFTH NATIONAL CLIMATE ASSESSMENT

NOVEMBER 2023
-
MARCH 2024

GLOBALCHANGE.GOV/NCA5

U.S. Global Change Research Program

Thank you

Allison Crimmins
acrimmins@usgcrp.gov

Connect with us:

@usgcrp

usgcrp

GlobalChange.gov

Recommended report citation

USGCRP, 2023: *Fifth National Climate Assessment* [Crimmins, A.R.., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock (eds)]. U.S. Global Change Research Program., Washington, DC, USA. https://doi.org/10.7930/NCA5.2023

nca2023.globalchange.gov

NCA5 Production

- In consultation with the Subcommittee on Global Change Research, a **Federal Steering Committee** was responsible for the report's development
- Written by nearly **500 authors** and **260 technical contributors**, federal and non-federal, from every state, representing a range of climate-change related expertise
- Coordination, facilitation, and logistical support, including author team points-of-contact, provided by the **USGCRP National Coordination Office**
- Editorial, production, graphic design, data analysis, documentation, and web development support provided by NOAA's **Technical Support Unit**
- Peer reviewed by the **National Academies of Sciences, Engineering, and Medicine**
- Five rounds of technical reviews and clearance by the **14 USGCRP member agencies**
- Seven **public** calls for contributors, content (technical inputs), and review and two rounds of Tribal Consultations on restructuring of information quality guidance to authors

NCA5 Timeline