

FIFTH NATIONAL CLIMATE ASSESSMENT



OVERVIEW

KEY

MESSAGE

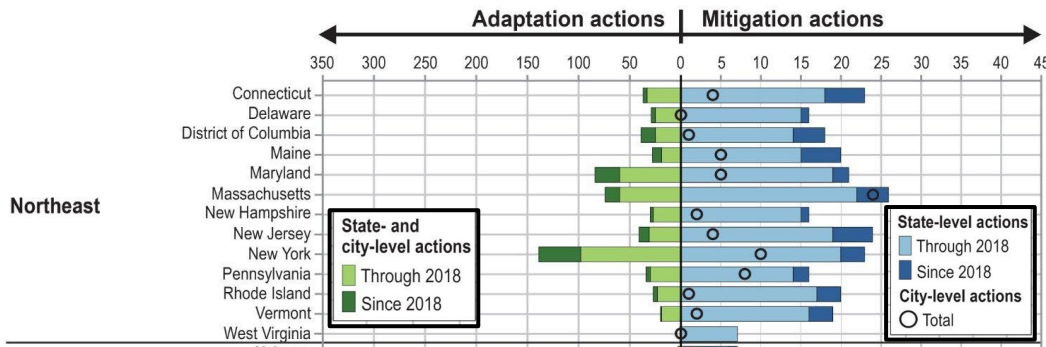
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The United States is Taking Action on Climate Change

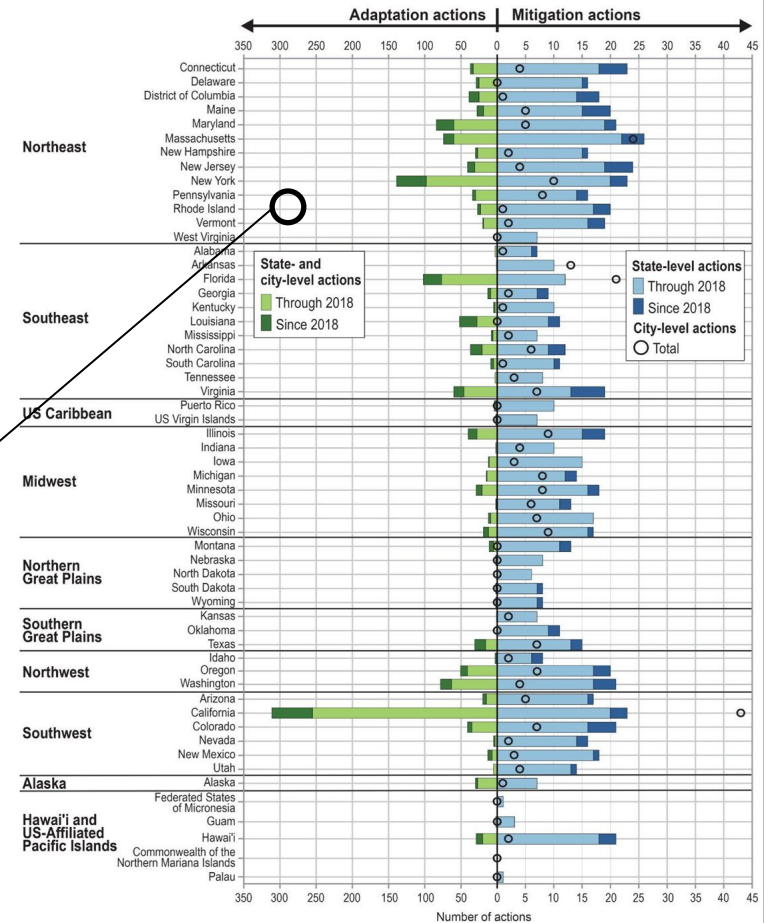
Since 2007, U.S. emissions have fallen and U.S. energy and emissions intensity have decreased—all while population and GDP have grown.

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.

US Adaptation and Mitigation Actions



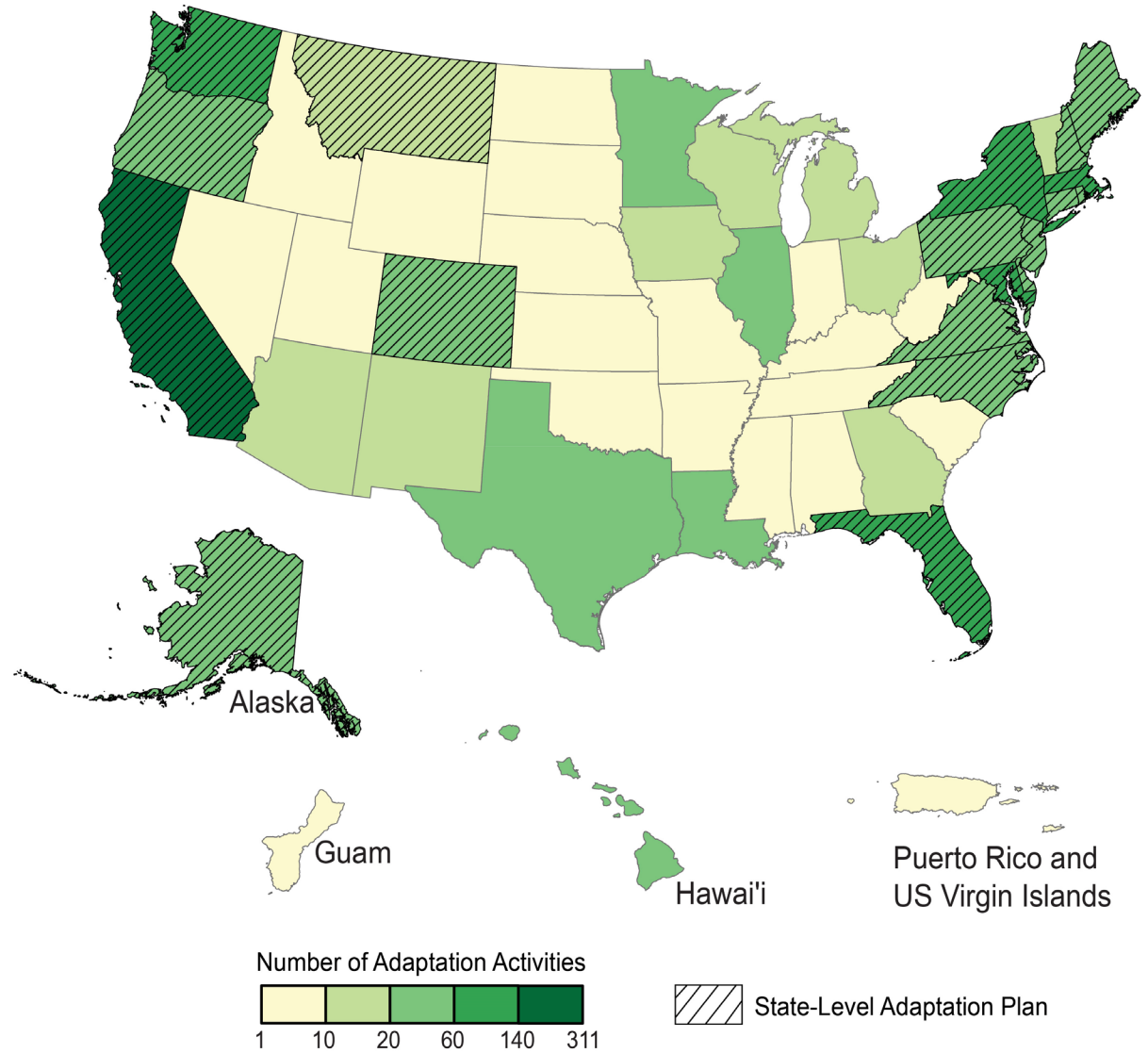
US Adaptation and Mitigation Actions



ADAPTATION
KEY
MESSAGE

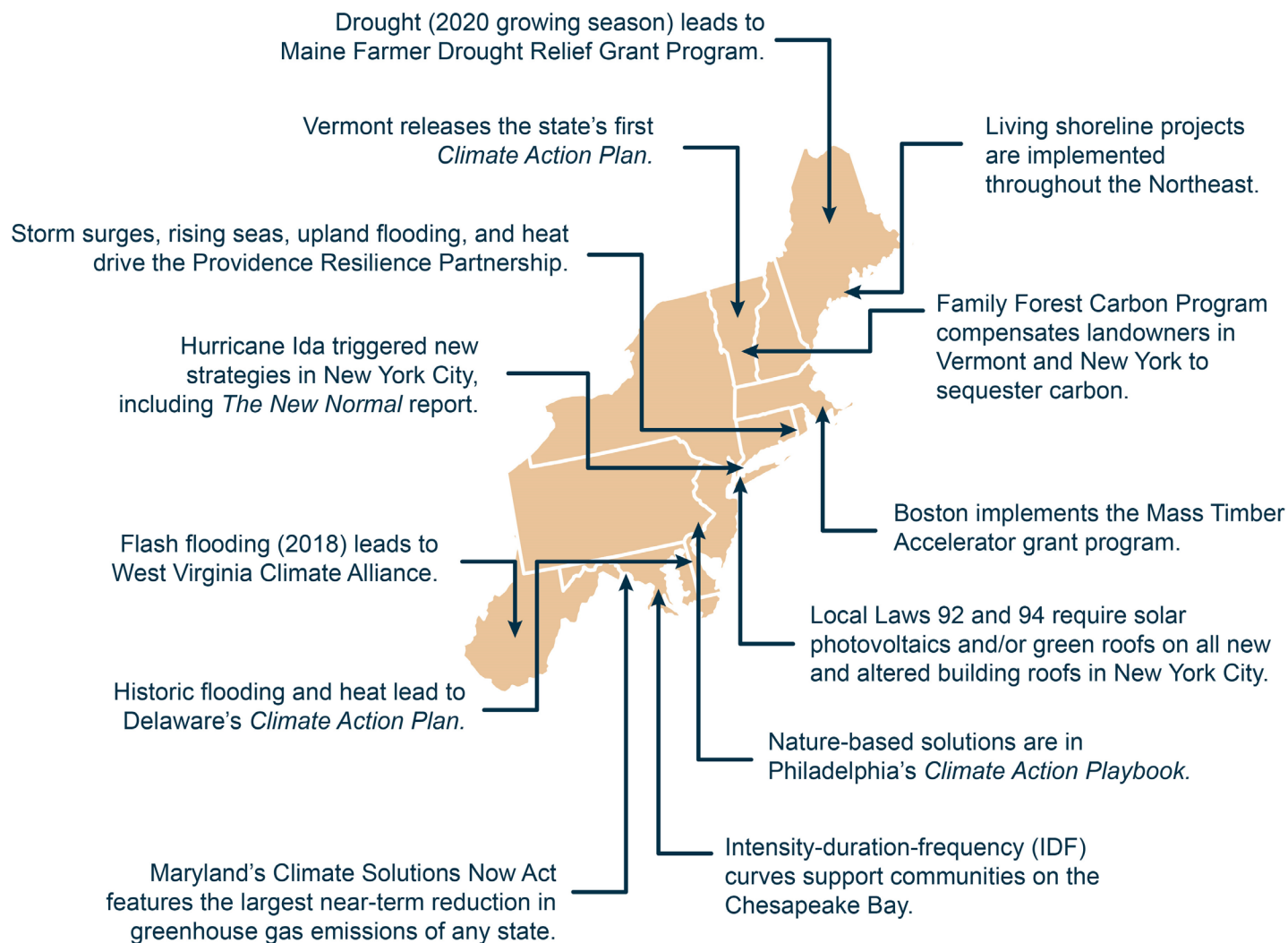
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Number of Publicly Documented Adaptation Activities (2018–2022)



Source: WSP, University of Delaware, and University of California, Irvine.

Examples of State and Local Responses to Extreme Weather

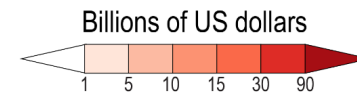
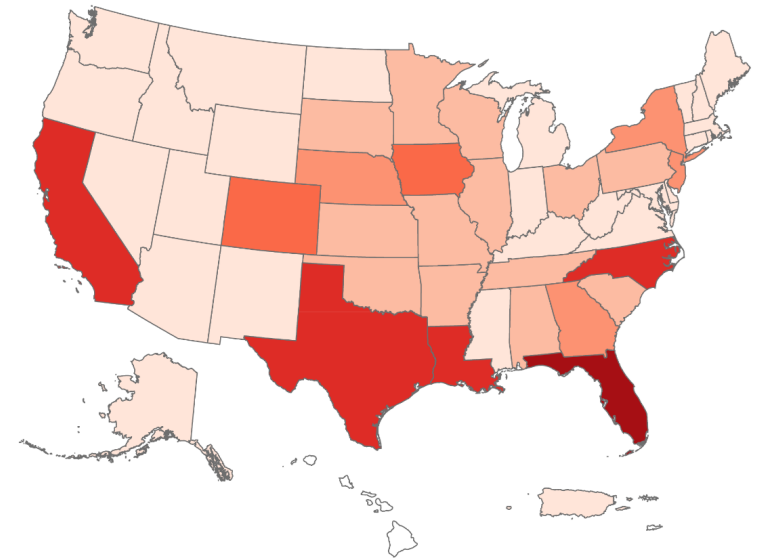


People in the U.S. Are Experiencing Increased Risks from Extreme Events

When the harmful impacts from more frequent and severe extremes interact with other stressors, the effects can ripple through systems, multiply harms, and lead to cascading failures.

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.

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

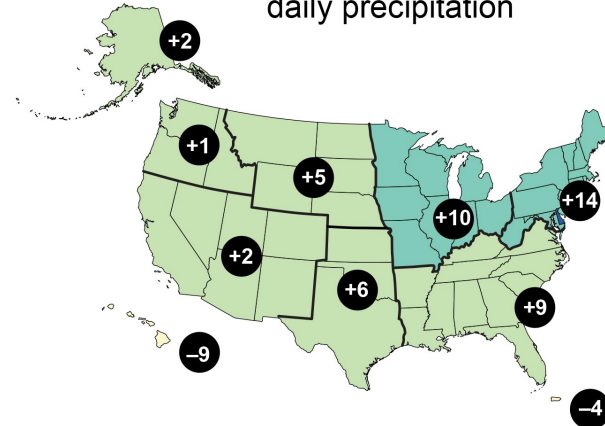
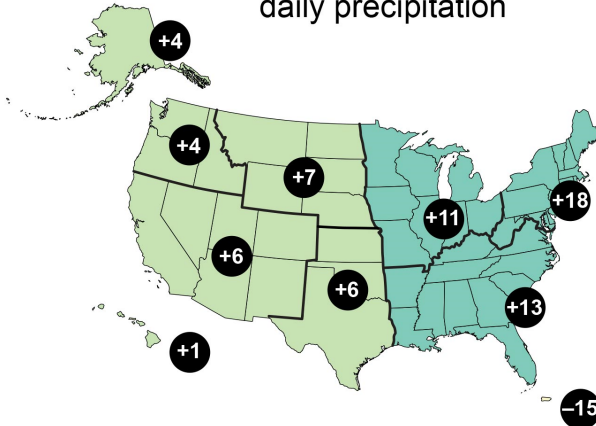
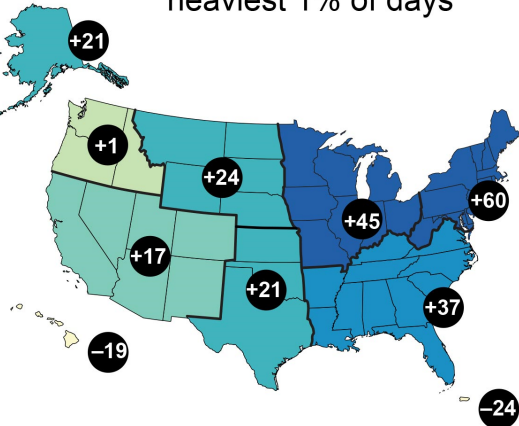


Observed Changes in the Frequency and Severity of Heavy Precipitation Events

a) Total precipitation on heaviest 1% of days

b) Five-year maximum daily precipitation

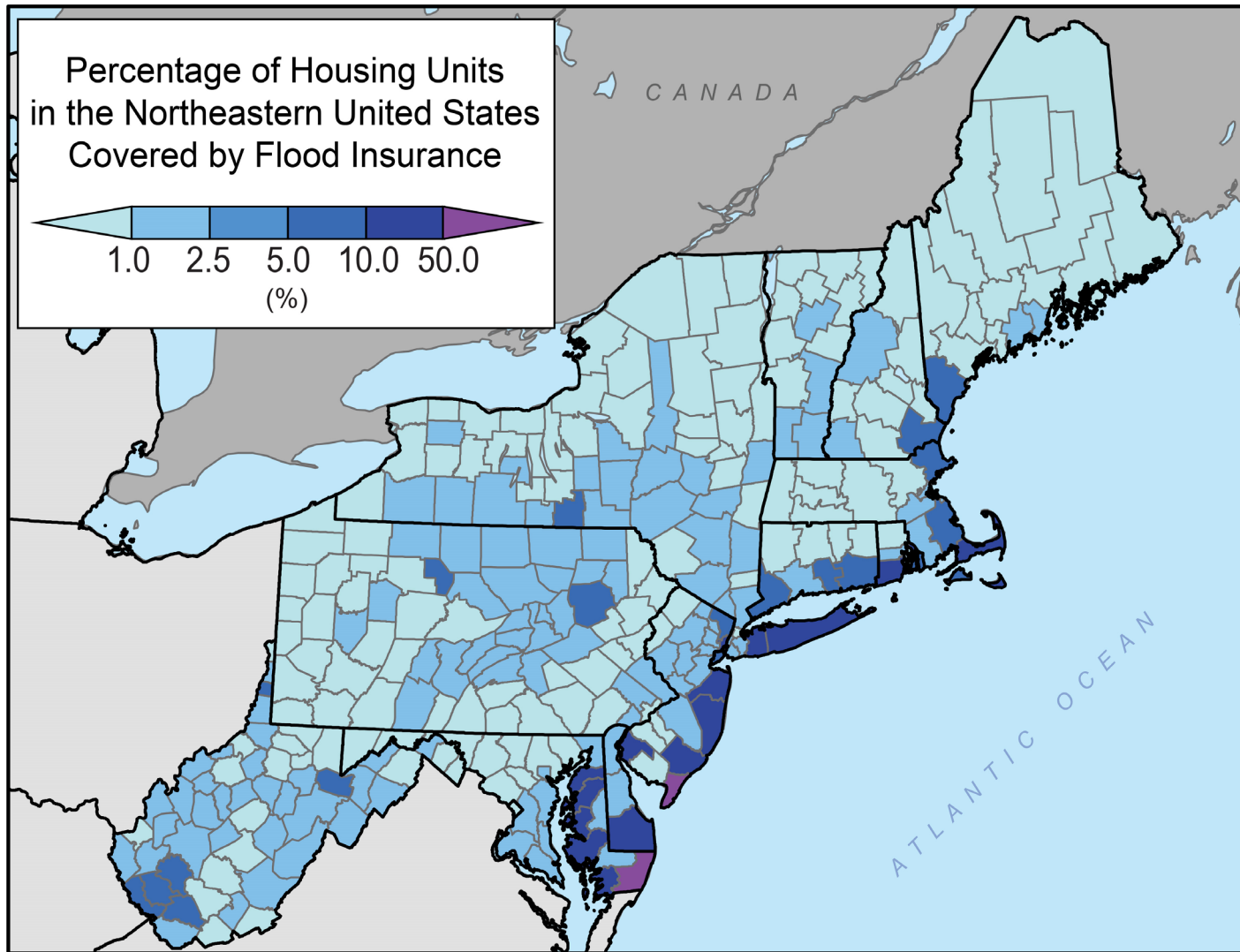
c) Annual maximum daily precipitation



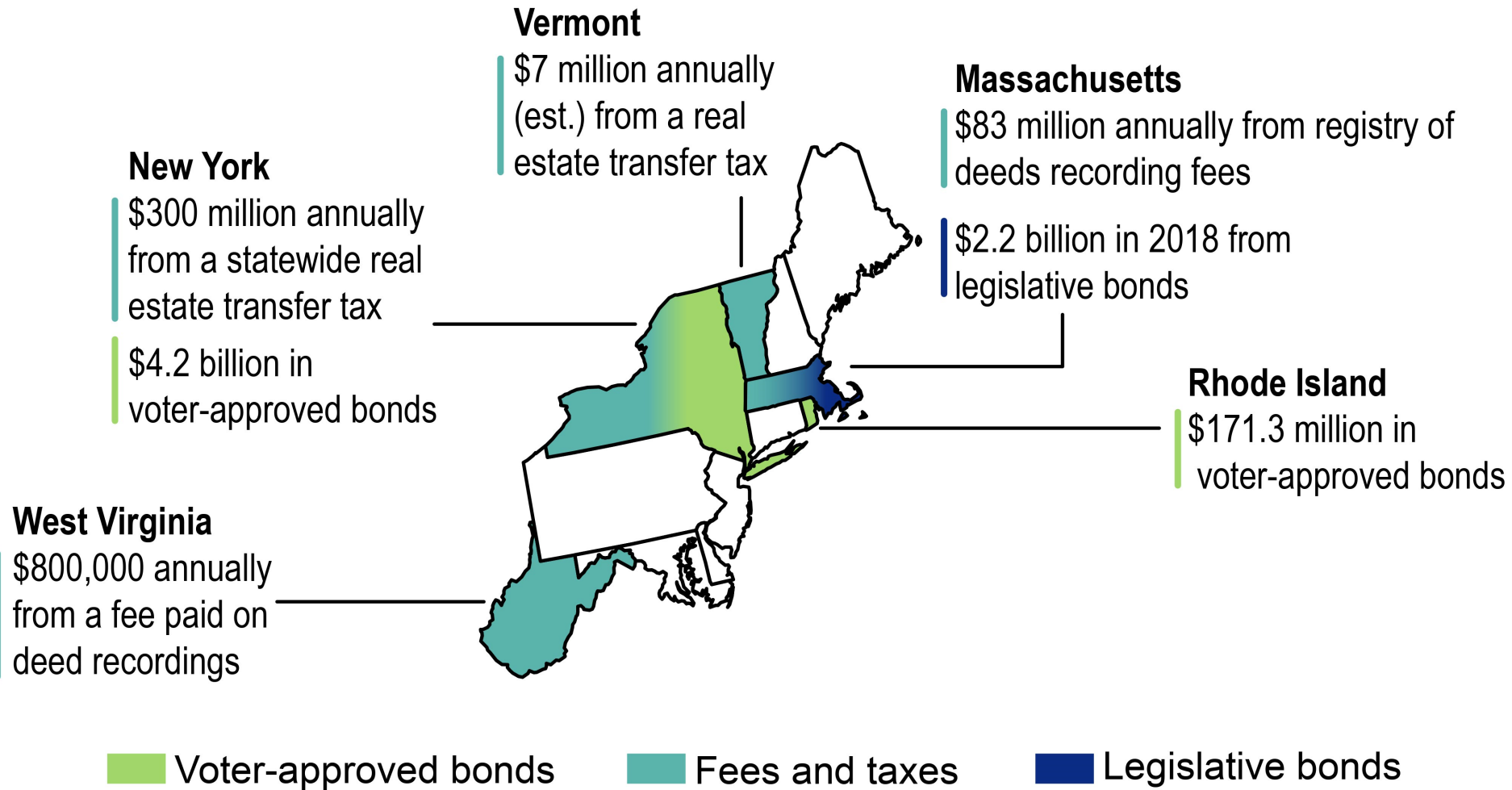
Change (%)



Flood Insurance Take-Up Rates by County



Public Funding for Resilience



Severe Weather Impacts to DoD Installations



NOAA satellite image of catastrophic hurricane damage at Tyndall AFB, Fla. NOAA photo.

<https://www.airandspaceforces.com/daily-report>



Overview



Extreme weather risk analysis



Resilience measures



Informing master planning

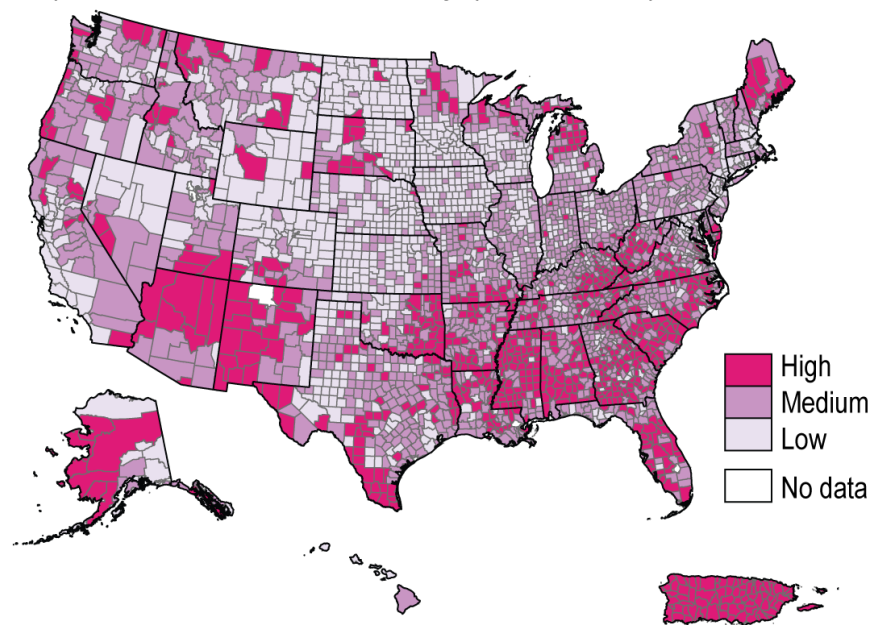
- Master planning
- Emergency planning
- Continuity of operations

Climate Change Exacerbates Social Inequities

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.

Some overburdened communities are at higher risk of climate impacts due to the cumulative effects of social and economic inequities caused by ongoing systemic discrimination, exclusion, and under- or disinvestment.

a) Social vulnerability (2015–2019)



Some highly vulnerable areas also have high economic losses from climate hazards (shown above: counties' Social Vulnerability Index (SoVI) scores, which comprise 29 different inputs that characterize underlying socioeconomic and demographic factors)

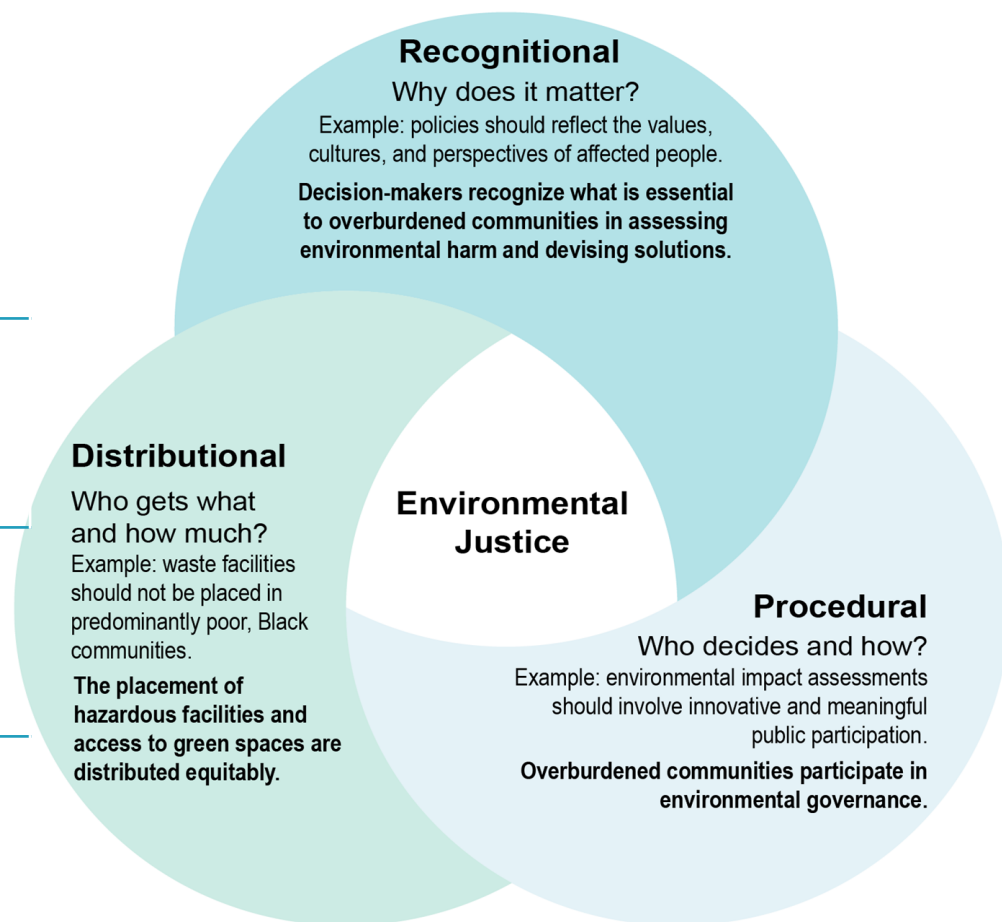
Scientific Advancements

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

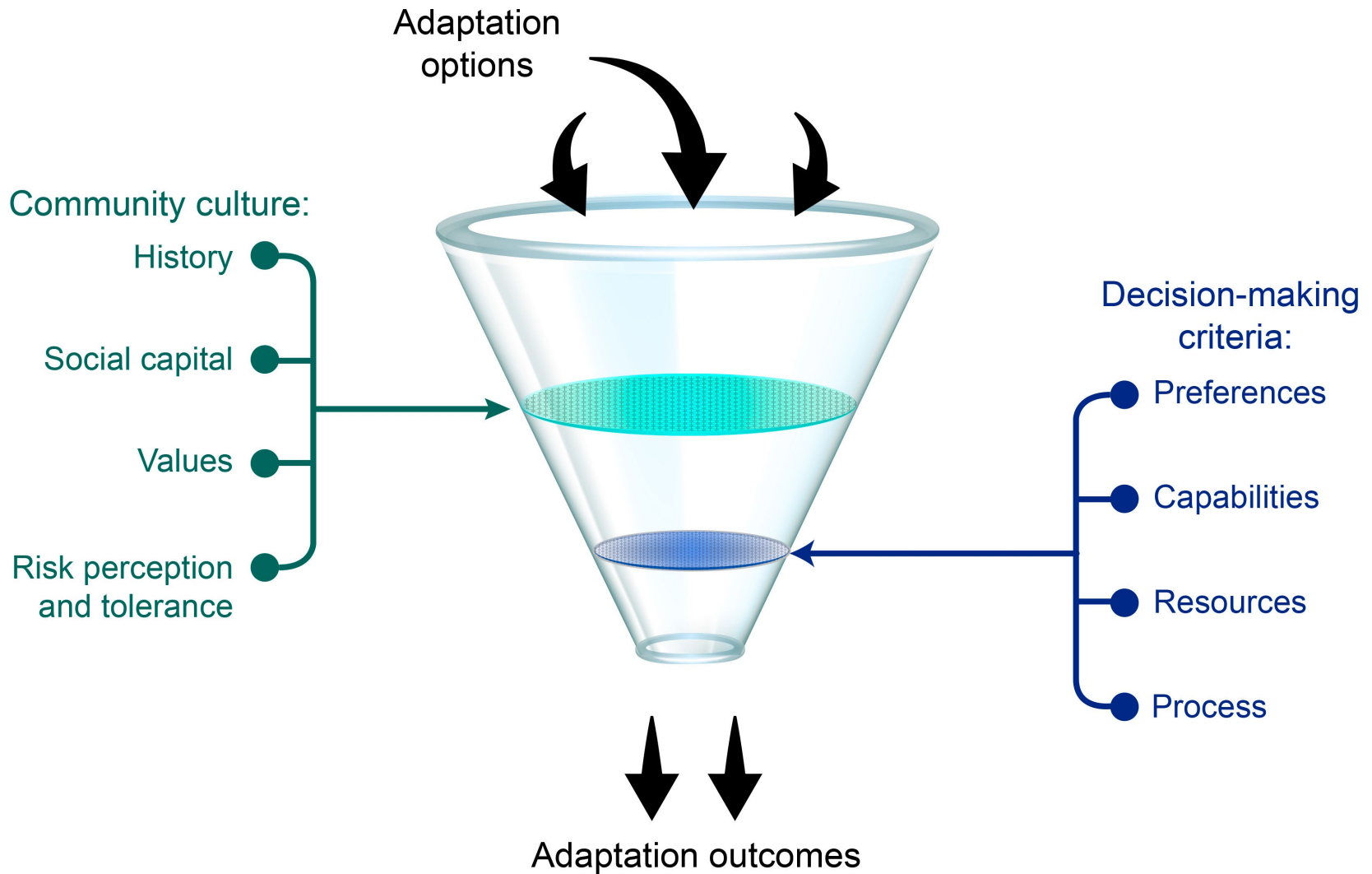
Featuring two new chapters, one on Economics and one on Social Systems and Justice

Exploring themes of environmental justice and equity across the entire Assessment

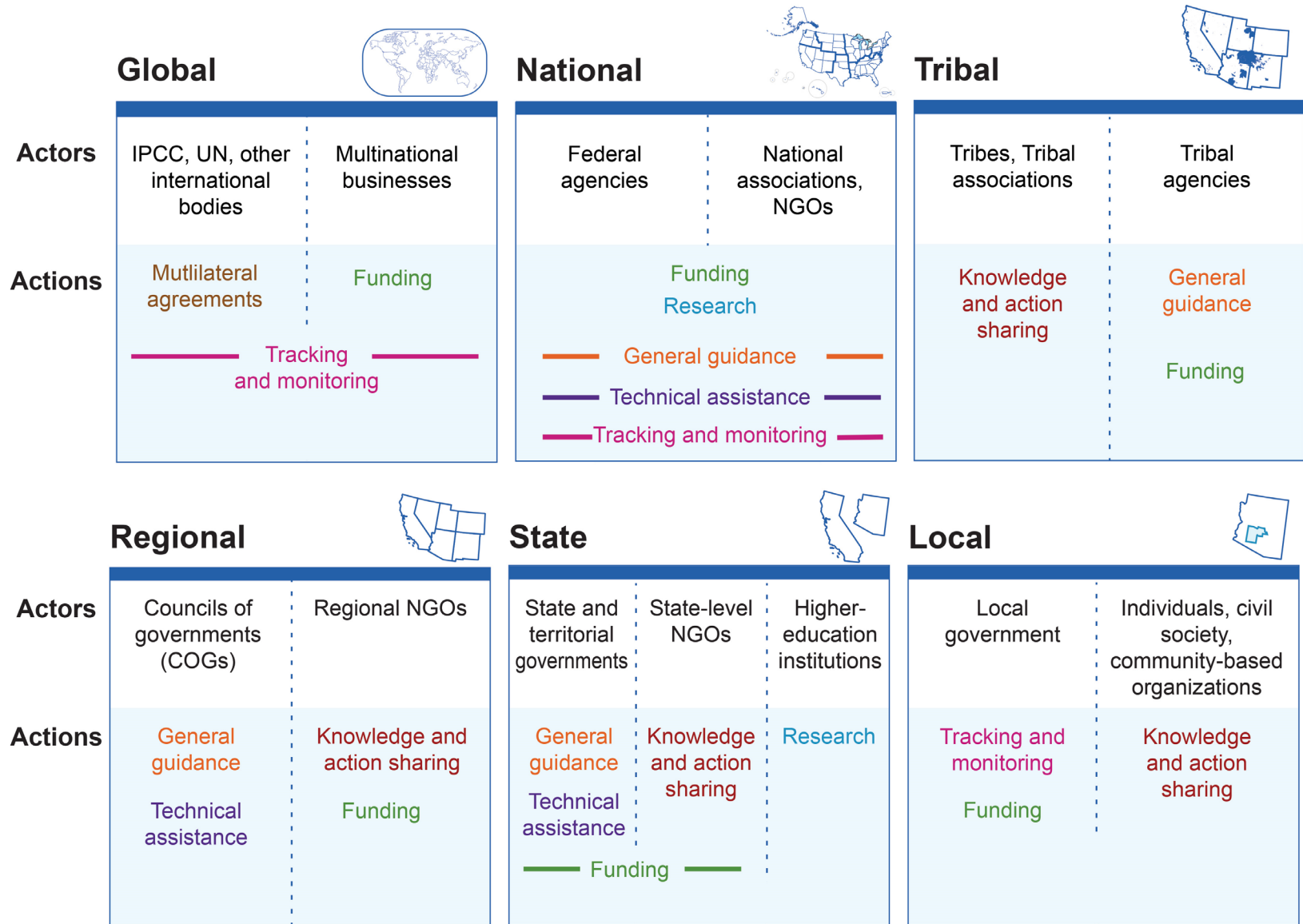
Highlighting local and state climate mitigation and adaptation actions



Adaptation Actions Defined by Multiple Factors



Organizations and Actors in Adaptation Governance






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.

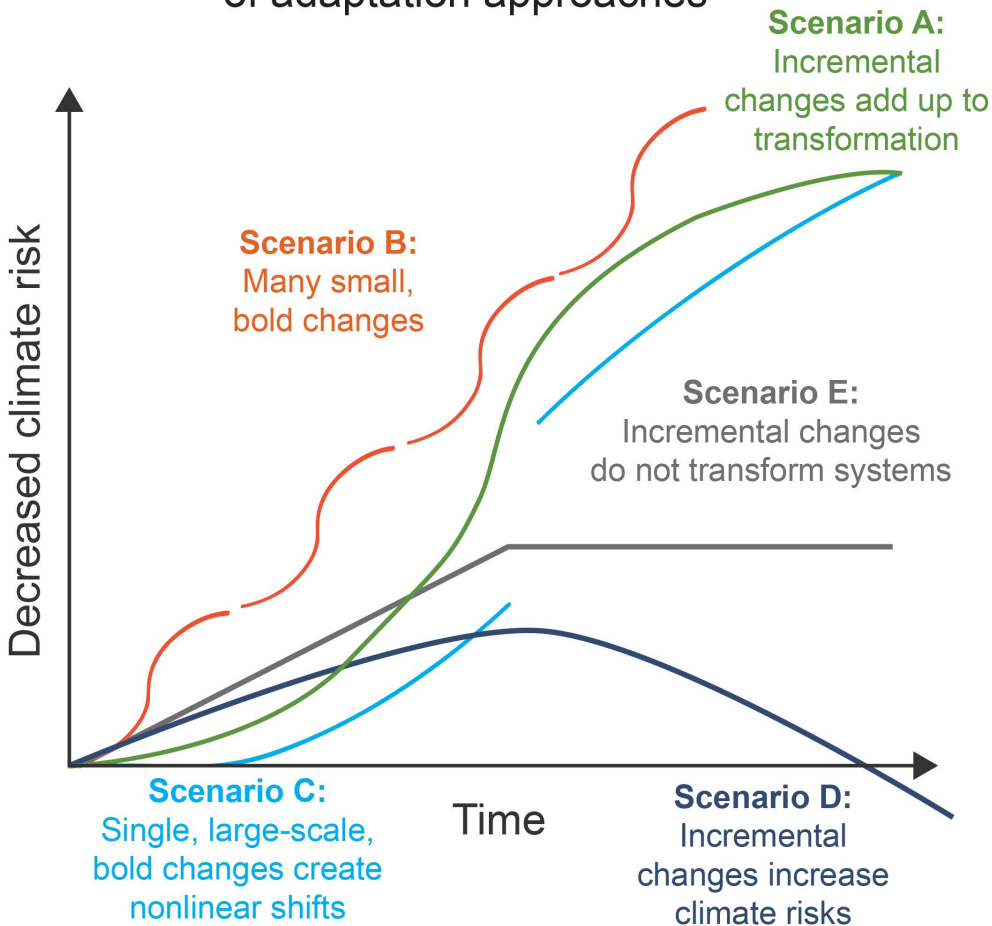
Table 1.3. Incremental Versus Transformative Adaptation Approaches

	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

Incremental and Transformative Adaptation Approaches

a)

Conceptual diagram
of adaptation approaches



b)

Examples to illustrate
conceptual approaches



Scenario A

Additional nature-based strategies over time build to a transformed landscape



Scenario B

Landowners shift land use, transforming parcel by parcel



Scenario C

Entire communities choose to move away from flood-prone waterfronts



Scenario D

Increased use of fossil-fuel-powered air-conditioning contributes to greater climate risk



Scenario E

Precision irrigation reduces drought risk but water scarcity remains

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.

Action to limit future warming and reduce risks can have near-term benefits and opportunities

Low-carbon energy jobs



Improved air quality



Health benefits



Economic benefits



Reduced risks to ecosystems



Reduced risks to biodiversity



More options for adaptation



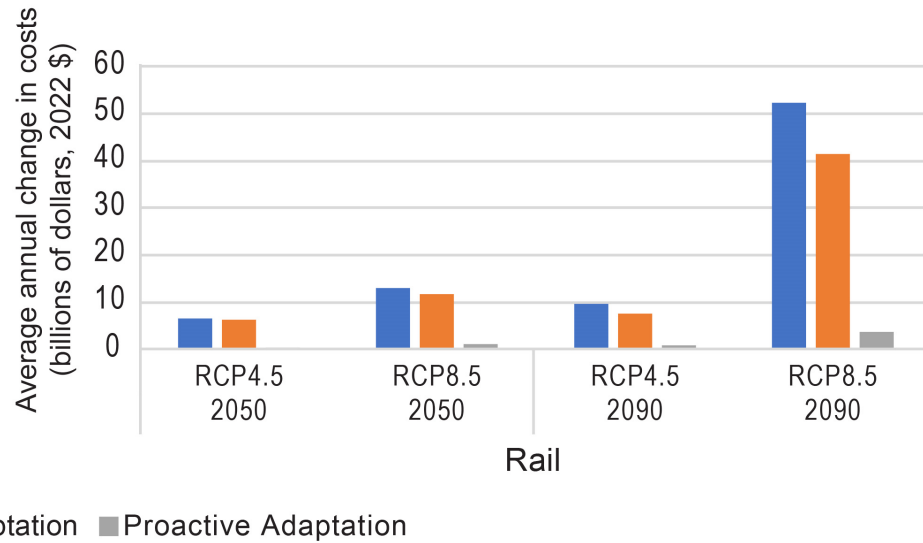
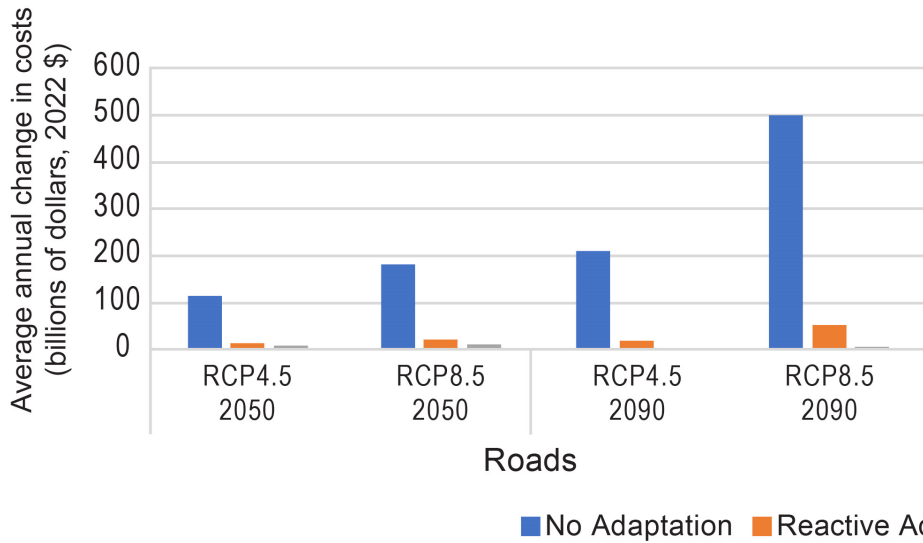
Social benefits



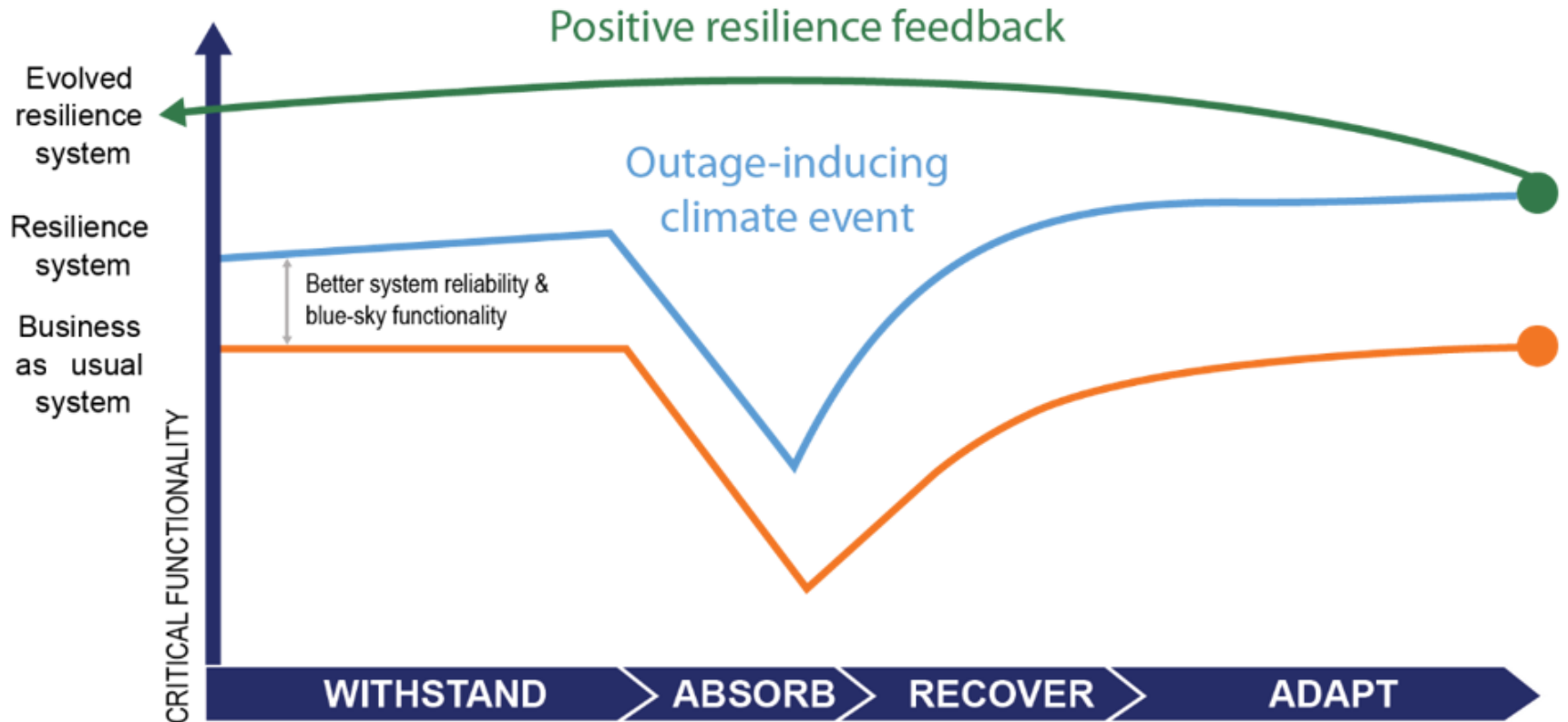
Estimated Annual Change in Costs Due to Climate Change

a) Estimated annual average change in costs due to climate change across adaptation scenarios for roads (in 2050 and 2090 compared to 1986–2005)

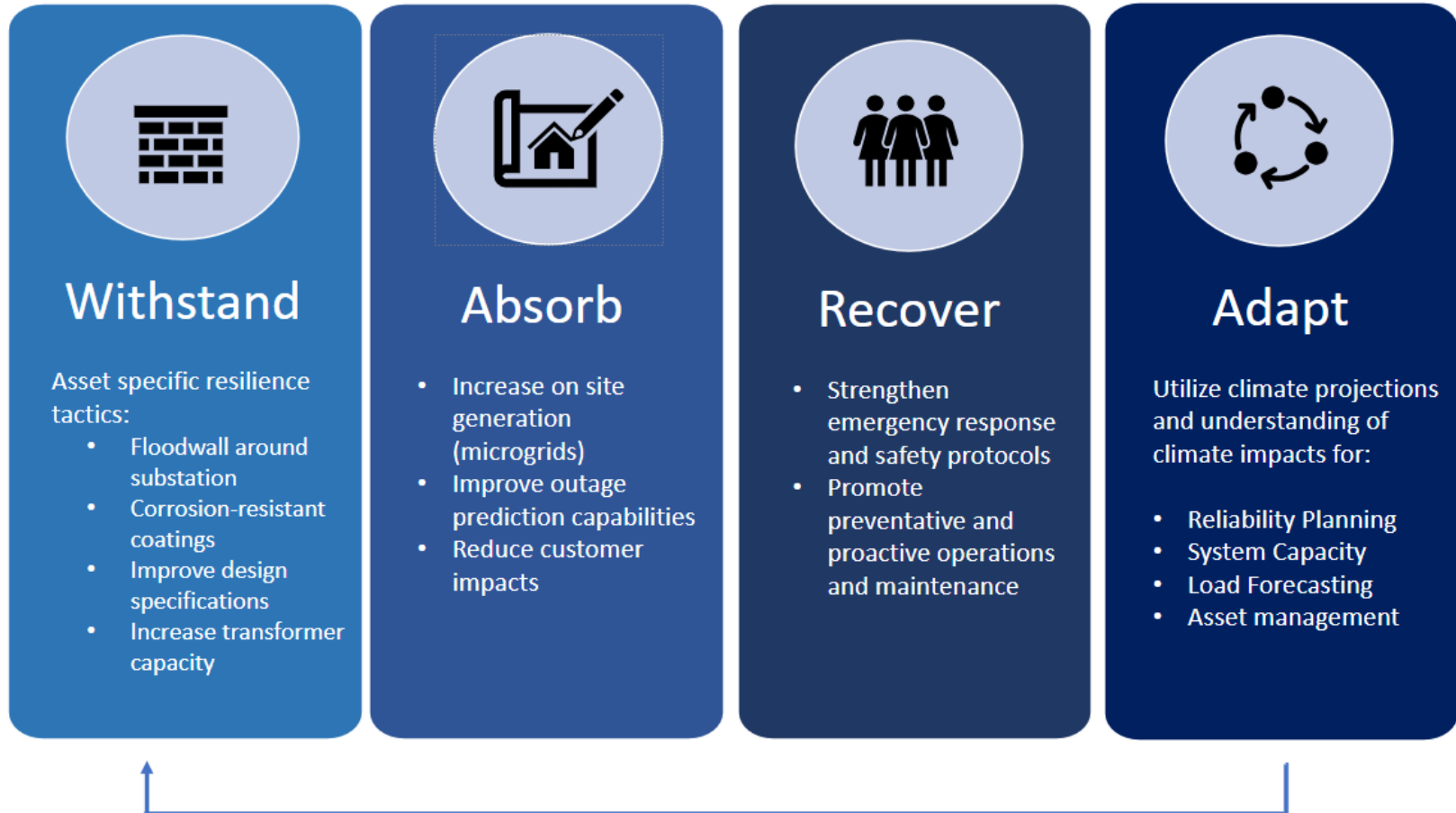
b) Estimated annual average change in costs due to climate change across adaptation scenarios for the rail sector (in 2050 and 2090 compared to 1986–2005)



Energy Resilience



Energy Resilience



Adaptation provides multiple benefits

Hazard	Asset Class	Measure	Total Benefits	Estimated Cost	Cost-Efficiency Ratio	Rank
Wind	Overhead conductors & Line Structures (Poles and Towers)	Increase transmission corridor widths	4.85	\$150,000	0.0000323	2
Wind	Overhead conductors & Line Structures (Poles and Towers)	Undergrounding	3.45	\$20,000,000	0.0000002	3
Wind	Overhead conductors & Line Structures (Poles and Towers)	Hazard Tree Removals in existing corridor	5.1	\$90,000	0.0000567	1

NCA5 Resources

NCA5 website: nca2023.globalchange.gov

- Downloadable slides for each chapter, with Key Messages and Figures
- 1-2 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
- Beta version upon release, with additional features to be added

Engagement and Resources

Engagement opportunities

- Webinar series for all chapters (Nov 2023 – March 2024)
- Regional workshops series (Spring/Summer 2024)

Resources coming soon

- PDFs of all chapters
- Conference materials for authors (posters, postcards, etc.)
- Spanish translated PDFs of all chapters: Overview, Caribbean, and Southwest by end of 2023; all chapters by April 2024
- Atlas and Climate Mapping for Resilience and Adaptation updates
- Updates to Climate Resilience Toolkit TBD
- Agency events and products TBD



<https://www.globalchange.gov/our-work/fifth-national-climate-assessment>

Visit the “Engagement” tab for webinar registration

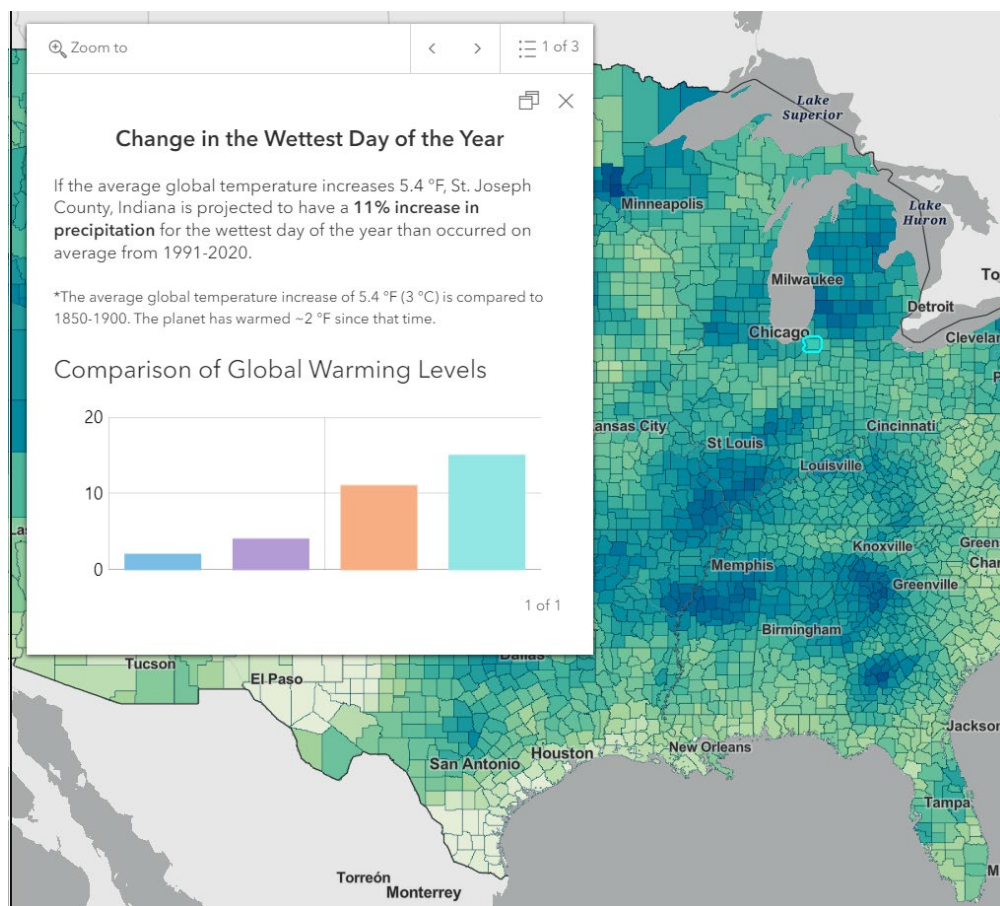
NCA Atlas

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”)



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)

Thank you

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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](#)