

Welcome to this week's presentation & conversation hosted by the **Canadian Association for the Club of Rome**, a Club dedicated to intelligent debate & action on global issues.



The views and opinions expressed in this presentation are those of the speaker & do not necessarily reflect the views or positions of CACOR.

US Climate Adaptation: Insights from the 5th US National Climate Assessment (NCA).

Description: Climate change is the warming of the Earth as a result of greenhouse gases like carbon dioxide (CO₂) accumulating in the air & trapping heat. In all regions of the USA, climate change has caused impacts such as increased temperatures, heavy precipitation, & sea level rise. These impacts will continue & the risks will accelerate without rapid & deep reductions in greenhouse gases globally. Thus, climate adaptation is a critical approach to managing the risks of current & future climate impacts. Adaptation is the process of adjusting to an actual or expected environmental change & its effects in a way that seeks to moderate harm or exploit beneficial opportunities. Our speaker will share the major scientific consensus findings of the Adaptation Chapter of the 5th US NCA, including the state of climate adaptation & well-known processes to increase the use of scientific information in climate adaptation decisions.

Biography: Dr. Melissa A. Kenney is the Director of Research & Knowledge Initiatives at the University of Minnesota's Institute on the Environment, where she directs efforts to build synergy across IonE's broad scientific research portfolio. She collaborates with faculty, community partners, U Minnesota's systemwide campuses, & the IonE staff to launch knowledge initiatives in support of IonE's impact goal initiatives on carbon neutrality, sustainable land use, & safe drinking water. Among her many accomplishments she is an author of the Adaptation Chapter of the 5th US NCA and was an author of the Decision Support Chapter of the 3rd US NCA. Her bio: <https://environment.umn.edu/staff/melissa-kenney/>

The presentation will be followed by a conversation, questions, & observations from the participants.

CACOR acknowledges that we all benefit from sharing the traditional territories of local Indigenous peoples (First Nations, Métis, & Inuit in Canada) and their descendants.



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US Climate Adaptation: Insights from the 5th US National Climate Assessment

Melissa A. Kenney, Ph.D.
Director of Research and Knowledge Initiatives
Environmental Decision Support Scientist

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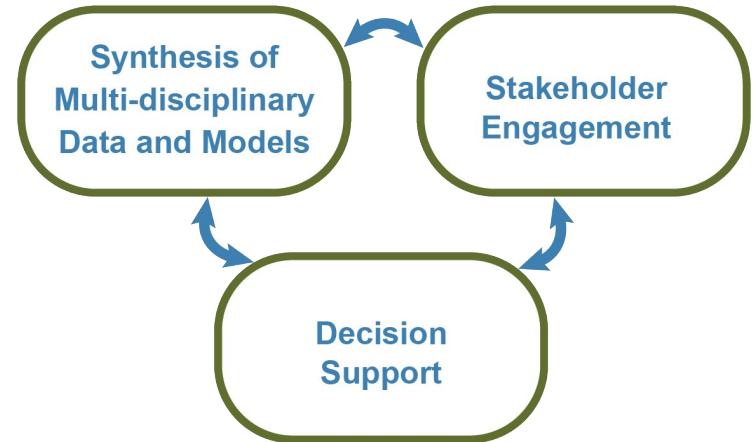
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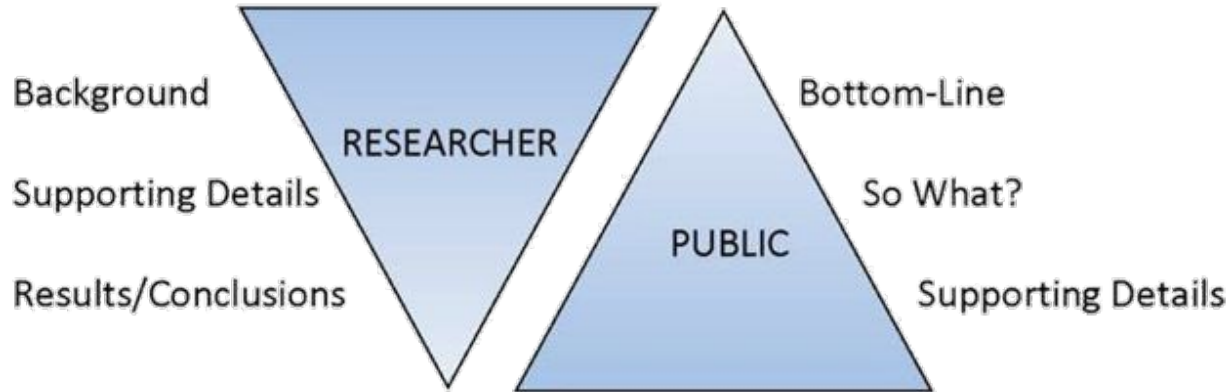
Environmental Decision Support Science

Environmental Decision Support Science Team conducts multidisciplinary social science research to increase the use of evidence in climate adaptation and mitigation, environmental management, community resilience, and interdependent infrastructure decisions.

Our goal is to understand and improve the processes and tools that aid these decisions, both in the public and private sectors.



Different Styles of Communication



FIFTH NATIONAL CLIMATE ASSESSMENT

Chapter 31 | Adaptation

CACOR Presentation



NCA5 Background

Mandate and Scope

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

Adaptation Is Occurring but Is Insufficient in Relation to the Pace of Climate Change

Diverse adaptation activities are occurring across the US (*very high confidence*). Adaptation activities are increasingly moving from awareness and assessment toward planning and implementation (*medium confidence*), with limited advancement toward monitoring and evaluation (*high confidence*). Numerous social, economic, physical, and psychological barriers are preventing more widespread adoption and implementation of adaptation (*high confidence*). Current adaptation efforts and investments are insufficient to reduce today's climate-related risks (*high confidence*) and are unlikely to keep pace with future changes in the climate (*medium confidence*).

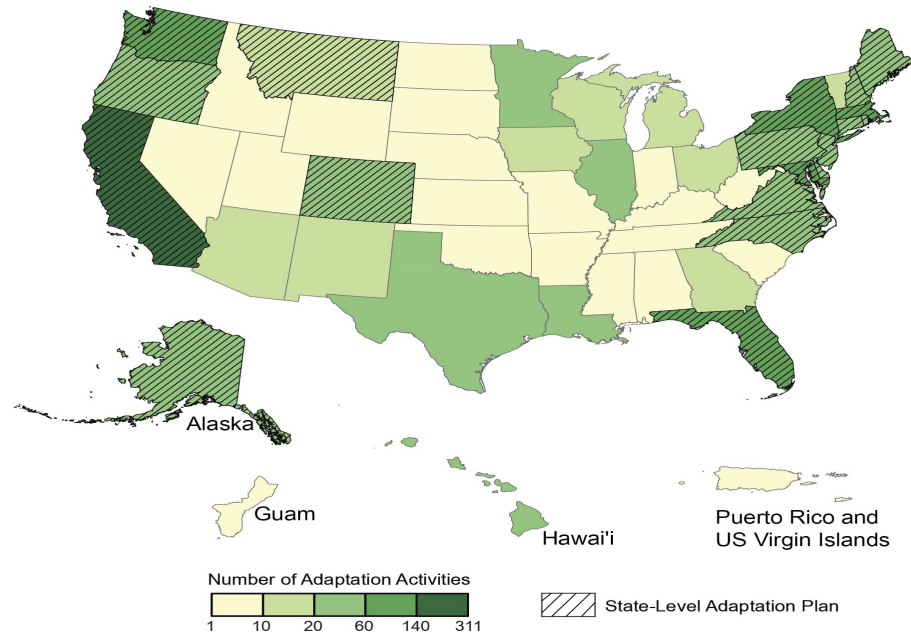


Figure 31.1. The level of publicly documented public- and private-sector adaptation activity varies widely across US states and territories (2018-2022).

Effective Adaptation Requires Centering Equity

People and communities are affected by climate change in different ways (*very high confidence*). How people and institutions adapt depends on social factors, including individual and community preferences, capacity, and access to resources (*very high confidence*). Adaptation processes, decisions (about whether, where, and how adaptation occurs), and actions that do not explicitly address the uneven distribution of climate harms, and the social processes and injustices underlying these disparities, can exacerbate social inequities and increase exposure to climate harms (*high confidence*).

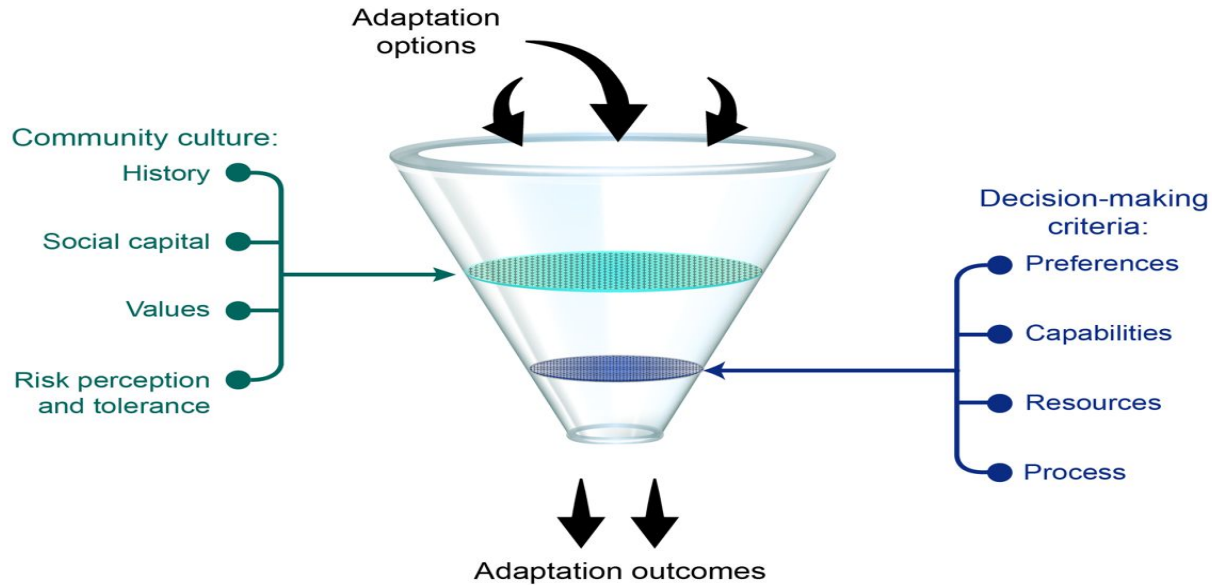
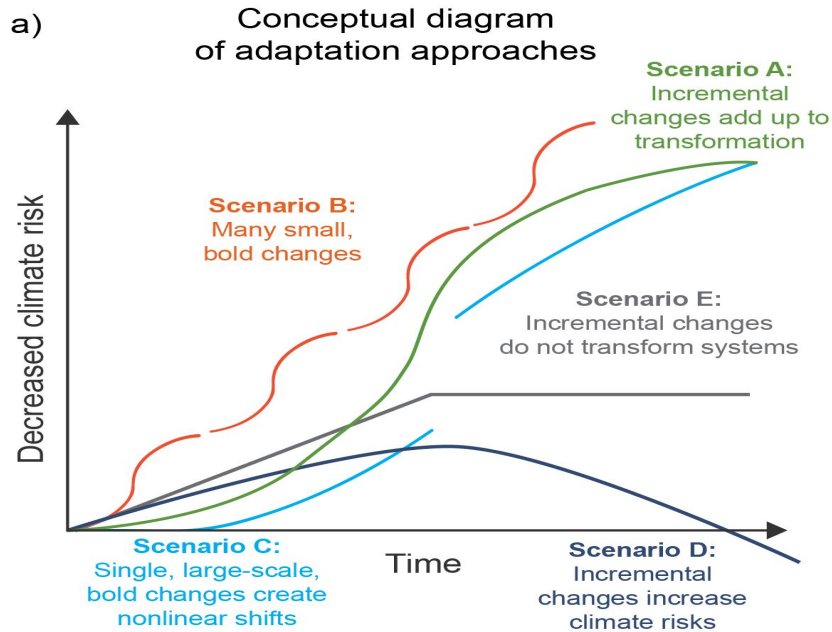


Figure 31.2. Adaptation outcomes are the result of individual and group values and decision-making processes and constraints.

Transformative Adaptation Will Be Needed to Adequately Address Climate-Related Risks

Climate adaptation actions undertaken in the United States to date have generally been small in scale and incremental in approach, involving minor changes to business as usual (*very high confidence*). Transformative adaptation, which involves more fundamental shifts in systems, values, and practices, will be necessary in many cases to adequately address the risks of current and future climate change (*high confidence*). New monitoring and evaluation methods will also be needed to assess the effectiveness and sufficiency of adaptation and to address equity (*high confidence*).



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

Figure 31.3. Incremental and transformative adaptation may take many forms, but incremental adaptation involves small changes while transformative adaptation involves profound shifts.

KEY
MESSAGE

4

Effective Adaptation Governance Empowers Multiple Voices to Navigate Competing Goals

Adaptation involves actors from government, private-sector, nongovernmental (e.g., nonprofit and for-profit institutions), and civil society organizations, which often have different priorities and approaches (*high confidence*). Adaptation decision-makers must balance competing goals while also addressing uncertainties regarding future climate change and the ways that political, social, and technological systems will be transformed (*high confidence*). To minimize the potential for adaptation actions to benefit some at the expense of others, adaptation processes must emphasize collaboration, center equity and justice, and incorporate a wide range of values and knowledge sources (*medium confidence*).

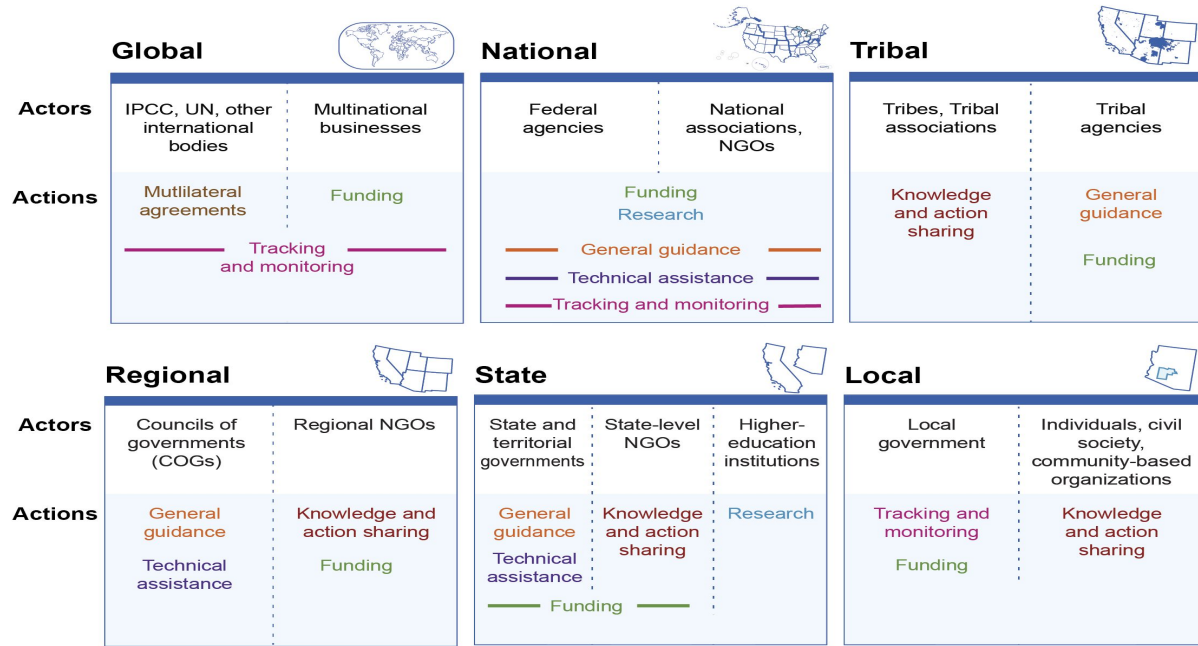


Figure 31.4. Climate adaptation involves numerous actions by different actors at multiple jurisdictional scales.

Adaptation Requires More Than Scientific Information and Understanding

Effective adaptation to a changing climate requires both decision-relevant climate information and evidence-based decision-making approaches (*high confidence*). Adaptation requires that researchers intentionally collaborate with communities to identify goals, assess vulnerability, improve capacity, and address contextual factors, such as values, culture, risk perception, and historic injustices (*medium confidence*). Climate services can be improved by ensuring access for historically disinvested communities and by attention to procedural and recognitional equity when scientists work with communities and decision-makers (*medium confidence*).

| | Incremental Adaptation | Transformative Adaptation |
|-----------------|---|--|
| Low Engagement | <p>Are services enabling maladaptation?</p> <p>➔</p> | <p>Are services supporting equity?</p> <p>⬇</p> |
| High Engagement | <p>Are services operationalized?</p> <p>➔</p> | <p>Are services sustained and mainstreamed?</p> |

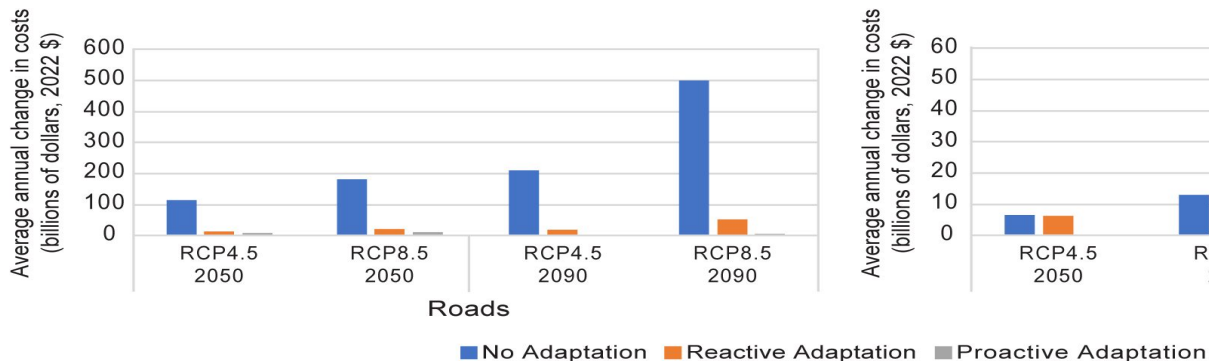
Table 31.2 Climate Services Can Be Designed to Support Transformative and Equitable Adaptation.

Adapted from Table 31.2

Adaptation Investments and Financing Are Difficult to Track and May Be Inadequate

Investments in adaptation are being made at the federal, state, territorial, Tribal, and local levels, as well as within the private sector, but they are not always evenly distributed, coordinated, tracked, or reported (*high confidence*) and may be inadequate (*medium confidence*). Future adaptation investment needs are expected to be significant, although projected amounts vary due to uncertainty in future emissions trajectories, associated impacts, and the timing of implementation (*high confidence*). Proactive adaptation can reduce some of the most severe costs of future climate change, particularly under very high emissions scenarios in the late 21st century (*medium confidence*), although adaptation is still needed in the present for communities and infrastructure that may not be well adapted to face current climate conditions (*high confidence*).

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)

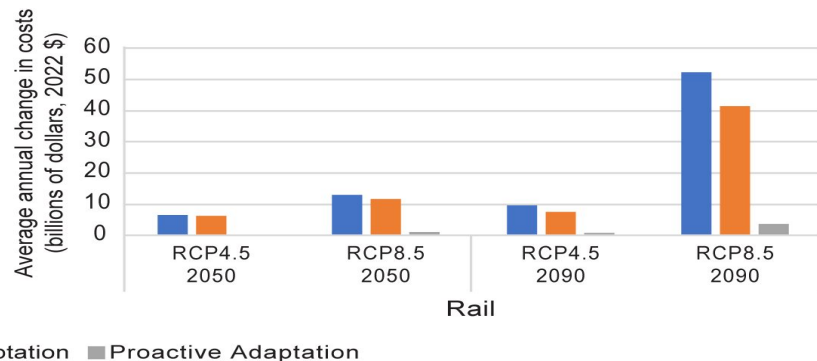


Figure 31.5. Future costs associated with climate change will depend on adaptation efforts and scenarios.

Chapter Team

Federal Coordinating Lead Author

Travis A. Dahl, US Army Corps of Engineers

Chapter Lead

Emily Wasley, WSP

Agency Chapter Lead Author

Caitlin F. Simpson, National Oceanic and Atmospheric Administration

Chapter Authors

Laura West Fischer, Electric Power Research Institute

Jennifer F. Helgeson, National Institute of Standards and Technology

Melissa A. Kenney, University of Minnesota, Institute on the Environment

Adam Parris, ICF

A.R. Siders, University of Delaware, Biden School of Public Policy and Administration

Eric Tate, University of Iowa

Nicola Ulibarri, University of California, Irvine



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Read the full chapter

<https://nca2023.globalchange.gov/chapter/31>

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Thank you!

Melissa A. Kenney
makenney@umn.edu



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