28 Reducing Risks Through Adaptation Actions

Seawall surrounding Kivalina, Alaska

Key Message 1

Adaptation Implementation Is Increasing

Adaptation planning and implementation activities are occurring across the United States in the public, private, and nonprofit sectors. Since the Third National Climate Assessment, implementation has increased but is not yet commonplace.

Key Message 2

Climate Change Outpaces Adaptation Planning

Successful adaptation has been hindered by the assumption that climate conditions are and will be similar to those in the past. Incorporating information on current and future climate conditions into design guidelines, standards, policies, and practices would reduce risk and adverse impacts.

Key Message 3

Adaptation Entails Iterative Risk Management

Adaptation entails a continuing risk management process; it does not have an end point. With this approach, individuals and organizations of all types assess risks and vulnerabilities from climate and other drivers of change (such as economic, environmental, and societal), take actions to reduce those risks, and learn over time.

Key Message 4

Benefits of Proactive Adaptation Exceed Costs

Proactive adaptation initiatives—including changes to policies, business operations, capital investments, and other steps—yield benefits in excess of their costs in the near term, as well as over the long term. Evaluating adaptation strategies involves consideration of equity, justice, cultural heritage, the environment, health, and national security.

Key Message 5

New Approaches Can Further Reduce Risk

Integrating climate considerations into existing organizational and sectoral policies and practices provides adaptation benefits. Further reduction of the risks from climate change can be achieved by new approaches that create conditions for altering regulatory and policy environments, cultural and community resources, economic and financial systems, technology applications, and ecosystems.

Across the United States, many regions and sectors are already experiencing the direct effects of climate change. For these communities, climate impacts—from extreme storms made worse by sea level rise, to longer-lasting and more extreme heat waves, to increased numbers of wildfires and floods—are an immediate threat, not a far-off possibility. Because these impacts are expected to increase over time, communities throughout the United States face the challenge not only of reducing greenhouse gas emissions, but also of adapting to current and future climate change to help mitigate climate risks.

Adaptation takes place at many levels—national and regional but mainly local—as governments, businesses, communities, and individuals respond to today's altered climate conditions and prepare for future change based on the specific climate impacts relevant to their geography and vulnerability. Adaptation has five general stages: awareness, assessment, planning, implementation, and monitoring and evaluation. These phases naturally build on one another, though they are often not executed sequentially and the terminology may vary. The Third National Climate Assessment (released in 2014) found the first three phases underway throughout the United States but limited in terms of on-the-ground implementation. Since then, the scale and scope of adaptation implementation have increased, but in general, adaptation implementation is not yet commonplace.

One important aspect of adaptation is the ability to anticipate future climate impacts and plan accordingly. Public- and private-sector decision-makers have traditionally made plans assuming that the current and future climate in their location will resemble that of the recent past. This assumption is no longer reliably true. Increasingly, planners, builders, engineers, architects, contractors, developers, and other individuals are recognizing the need to take current and projected climate conditions into account in their decisions about the location and design of buildings and infrastructure, engineering standards, insurance rates,

property values, land-use plans, disaster response preparations, supply chains, and cropland and forest management.

In anticipating and planning for climate change, decision-makers practice a form of risk assessment known as iterative risk management. Iterative risk management emphasizes that the process of anticipating and responding to climate change does not constitute a single set of judgments at any point in time; rather, it is an ongoing cycle of assessment, action, reassessment, learning, and response. In the adaptation context, public- and private-sector actors manage climate risk using three types of actions: reducing exposure, reducing sensitivity, and increasing adaptive capacity.

Climate risk management includes some attributes and tactics that are familiar to most businesses and local governments, since these organizations already commonly manage or design for a variety of weather-related risks, including coastal and inland storms, heat waves, water availability threats, droughts, and floods. However, successful adaptation also requires the often unfamiliar challenge of using information on current and future climate, rather than past climate, which can prove difficult for those lacking experience with climate change datasets and concepts. In addition, many professional practices and guidelines, as well as legal requirements, still call for the use of data based on past climate. Finally, factors such as access to resources, culture, governance, and available information can affect not only the risk faced by different populations but also the best ways to reduce their risks.

Achieving the benefits of adaptation can require up-front investments to achieve longer-term savings, engaging with differing stakeholder interests and values, and planning in the face of uncertainty. But adaptation also presents challenges, including difficulties in obtaining the necessary funds, insufficient information and relevant expertise, and jurisdictional mismatches.

In general, adaptation can generate significant benefits in excess of its costs. Benefit–cost analysis can help guide organizations toward actions that most efficiently reduce risks, in particular those that, if not addressed, could prove extremely costly in the future. Beyond those attributes explicitly measured by benefit–cost analysis, effective adaptation can also enhance social welfare in many ways that can be difficult to quantify and that people will value differently, including improving economic opportunity, health, equity, security, education, social connectivity, and sense of place, as well as safeguarding cultural resources and practices and environmental quality.

A significant portion of climate risk can be addressed by mainstreaming; that is, integrating climate adaptation into existing organizational and sectoral investments, policies, and practices, such as planning, budgeting, policy development, and operations and maintenance. Mainstreaming of climate adaptation into existing decision processes has already begun in many areas, such as financial risk reporting, capital investment planning, engineering standards, military planning, and disaster risk management. Further reduction of the risks from climate change, in particular those that arise from futures with high levels of greenhouse gas emissions, calls for new approaches that create conditions for altering regulatory and policy environments, cultural and community resources, economic and financial systems, technology applications, and ecosystems.

For full chapter, including references and Traceable Accounts, see https://nca2018.globalchange.gov/chapter/adaptation.

Five Adaptation Stages and Progress

The figure illustrates the adaptation iterative risk management process. The gray arced lines compare the current status of implementing this process with the status reported by the Third National Climate Assessment in 2014. Darker color indicates more activity. *From Figure 28.1 (Source: adapted from National Research Council, 2010. Used with permission from the National Academies Press, © 2010, National Academy of Sciences. Image credits, clockwise from top: National Weather Service; USGS; Armando Rodriguez, Miami-Dade County; Dr. Neil Berg, MARISA; Bill Ingalls, NASA).*