Fourth National Climate Assessment

Volume II

Impacts, Risks, and Adaptation in the United States

U.S. Global Change Research Program

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The regions defined in NCA4 are similar to those used in the Third National Climate Assessment (NCA3),[8] with these exceptions: the Great Plains region, formerly stretching from the border of Canada to the border of Mexico, is now divided into the Northern Great Plains and Southern Great Plains along the Nebraska-Kansas border; and content related to the U.S. Caribbean islands is now found in its own chapter, distinct from the Southeast region.

Response Chapters

The response chapters assess the science of adaptation and mitigation, including benefits, tradeoffs, and best practices of ongoing adaptation measures and quantification of economic damages that can be avoided by reducing greenhouse gas emissions. The National Climate Assessment does not evaluate or recommend specific policies.

Economic Estimates

To the extent possible, economic estimates in this report have been converted to 2015 dollars using the U.S. Bureau of Economic Affairs' Implicit Price Deflators for Gross Domestic Product, Table 1.1.9. For more information, please visit: https://bea.gov/national/index.htm. Where documented in the underlying literature, discount rates in specific estimates in this assessment are noted next to those projections.

Use of Scenarios

Climate modeling experts develop climate projections for a range of plausible futures. These projections capture variables such as the relationship between human choices, greenhouse gas (GHG) and particulate matter emissions, GHG concentrations in our atmosphere, and the resulting impacts, including temperature change and sea level rise. Some projections are consistent with continued dependence on fossil fuels, while others are achieved by reducing GHG emissions. The resulting range of projections reflects, in part, the uncertainty that comes with quantifying future human activities and their influence on climate.

The most recent set of climate projections developed by the international scientific community is classified under four Representative Concentration Pathways, or RCPs.[9] A wide range of future socioeconomic assumptions could be consistent with the RCPs used throughout NCA4.

NCA4 focuses on RCP8.5 as a "higher" scenario, associated with more warming, and RCP4.5 as a "lower" scenario with less warming. Other RCP scenarios (e.g., RCP2.6, a "very low" scenario) are used where instructive, such as in analyses of mitigation science issues. To promote understanding while capturing the context of the RCPs, authors use the phrases "a higher scenario (RCP8.5)" and "a lower scenario (RCP4.5)." RCP8.5 is generally associated with higher population growth, less technological innovation, and higher carbon intensity of the global energy mix. RCP4.5 is generally associated with lower population growth, more technological innovation, and lower carbon intensity of the global energy mix. NCA4 does not evaluate the feasibility of the socioeconomic assumptions within the RCPs. Future socioeconomic conditions—and especially the relationship between economic growth, population growth, and innovation—will have a significant impact on which climate change scenario is realized. The use of RCP8.5 and RCP4.5 as core scenarios is broadly consistent with the range used in NCA3.[8] For additional detail on these scenarios and what they represent, please see Appendix 3 (Data Tools and Scenario Products), as well as Chapter 4 of the *Climate Science Special Report*.[10]