Concluding Thoughts

Responding to changing conditions

Previous assessments established that human-induced climate change is happening now, and that environmental and societal consequences and vulnerabilities are already apparent. This report confirms, solidifies, and extends these conclusions for the United States. It reviews the latest understanding of how climate change is already affecting important sectors and regions. In particular, it reports that the number and size of many climate change impacts are occurring faster than previous assessments had suggested. The report represents a significant update to previous work, as it summarizes the Climate Change Science Program Synthesis and Assessment Products and other recent studies that examine how climate change and its effects are projected to continue to increase over this century and beyond.

Society's responses to the changes include both measures to reduce emissions of greenhouse gases (mitigation) and actions to adapt to changes that cannot be avoided. Such strategies will require careful planning and long-term commitment at every level of government, industry, and society. There is much to learn about the effectiveness of the various types of adaptation responses and how they will interact with each other and with mitigation actions. Responses to the climate-change challenge will almost certainly evolve over time as society learns by doing.

The value of assessments

Science has revolutionized our ability to observe and model the Earth's climate and living systems, to see how they are changing, and to predict future changes in ways that were not possible for prior generations. These advances have enabled the assessment of climate change, climate impacts, vulnerabilities, and response strategies. Assessments serve a very important function in adaptive learning. They can identify changes in the underlying science, provide critical analysis of issues, and also highlight key findings and key unknowns that can guide decision making. Regular assessments also serve as progress reports needed to evaluate and improve policy- and decision making related to climate change.

Impacts and adaptation research includes complex human dimensions, such as economics, management, governance, behavior, and equity. Comprehensive assessments provide an opportunity to evaluate the social implications of climate change within larger questions of how communities and the nation as a whole create future sustainable development paths.

A vision for future U.S. assessments

Over the past decade, U.S. federal agencies have undertaken two coordinated, national-scale efforts to evaluate the impacts of global climate change on the nation. Each effort produced a report to the nation—*Climate Change Impacts on the United States* published in 2000 and this report, *Global Climate Change Impacts in the United States,* published in 2009. A unique feature of the first report was its creation of a national discourse on climate

change that involved hundreds of scientists and thousands of others including farmers, ranchers, resource managers, city planners, business people, and local and regional government officials. A notable feature of the second report is the incorporation of information from the 21 topic-specific Synthesis and Assessment Products.

A vision for future climate change assessments includes both sustained extensive practitioner and stakeholder involvement, and periodic, targeted, scientifically rigorous reports similar to the Synthesis and Assessment Products. The value of practitioner and stakeholder involvement includes helping scientists understand what information society wants and needs. In addition, the problem-solving abilities of practitioners and stakeholders will be essential to designing, initiating, and evaluating mitigation and adaptation strategies, and their interactions. The best decisions about these strategies will come when there is widespread understanding of the complex issue of climate change—the science and its many implications for our nation.