About this Report

What is this Report?

This Report summarizes the science of climate change and the impacts of climate change on the United States, now and in the future. It is largely based on results of the U.S. Climate Change Science Program (CCSP), and integrates those results with related research from around the world. This Unified Synthesis Product (USP) discusses climate-related impacts for various societal and environmental sectors and regions across the nation, with the goal of better informing public and private decision making at all levels.

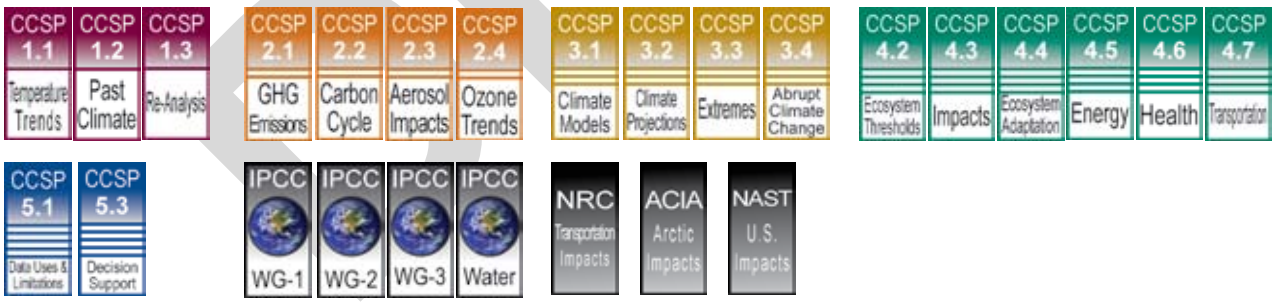
Who called for it, who wrote it, and who approved it?

The U.S. Climate Change Science Program called for this Report. An expert team of scientists operating under the authority of the Federal Advisory Committee Act, assisted by communication specialists, wrote the document. The final version of the USP will be approved by the lead CCSP Agency for this Report, the National Oceanic and Atmospheric Administration, as well as the other CCSP agencies. Final approval rests with the Committee on the Environment and Natural Resources on behalf of the National Science and Technology Council[a]. The USP meets all Federal requirements associated with the Information Quality Act, including those pertaining to public comment and transparency.

What are its sources?

The Report draws from a large body of scientific information. This includes all CCSP Synthesis and Assessment Products (SAPs), a set of reports designed to address key policy-relevant issues in climate science (see page 163). In addition, other peer-reviewed scientific assessments were used, including those of the Intergovernmental Panel on Climate Change, the U.S. National Assessment of the Consequences of Climate Variability and Change, the Arctic Climate Impact Assessment, the National Research Council's Transportation Research Board report on the Potential Impacts of Climate Change and U.S. Transportation, and a variety of regional climate impact assessments. The USP is augmented with government statistics as necessary (such as population census and energy usage) as well as observations and peer-reviewed research updated through November of 2008. The author team did not conduct original research for this Report. The icons on the bottom of this page represent some of the major sources drawn upon for this synthesis Report.

On the first page of each major section, the sources primarily drawn upon for that section are shown using these icons. Additionally, endnotes, indicated by superscript numbers and compiled at the end of the book, are used for specific references throughout the Report.



[a] The National Science and Technology Council (NSTC) was established by Executive Order on November 23, 1993. This Cabinet-level Council is the principal means within the executive branch to coordinate science and technology policy across the diverse entities that make up the Federal research and development enterprise. Chaired by the President, the membership of the NSTC is made up of the Vice President, the Director of the Office of Science and Technology Policy, Cabinet Secretaries and Agency Heads with significant science and technology responsibilities, and other White House officials.

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Does this Report deal with options for responding to climate change?

While the primary focus of the USP is on the impacts of climate change in the United States, it also deals with some of the actions society is already taking or can take to respond to the climate challenge. Responses to climate change fall into two broad categories: (1) "mitigation" measures to reduce climate change by reducing emissions of heat-trapping gases and particles; and (2) "adaptation" measures to improve our ability to cope with or avoid harmful impacts and take advantage of beneficial ones, now and in the future. These two types of responses are linked in that more effective mitigation measures reduce the need for adaptation.

Mitigation is a subject of ongoing study by the U.S. Government's Climate Change Technology Program[b] and CCSP, among others. The USP only touches briefly on mitigation as narrowly constrained by two of the CCSP SAPs[c].

While the USP does address adaptation, it does not do so comprehensively. Rather, in the context of impacts, the USP identifies examples of actions currently being pursued in various sectors and regions to address climate change, as well as other specific environmental problems that could be exacerbated by climate change such as urban air pollution and heat waves. In most cases, there is currently insufficient information to evaluate the practicality, effectiveness, costs, or benefits of these measures, highlighting a need for research in this area. Thus, the discussion of various public and private adaptation examples should not be viewed as an endorsement of any particular option, but rather as illustrative examples of approaches being tried. Adaptation options are of special interest because they have the potential to affect the impacts of current and future climate variability and change.

How is the likelihood of various outcomes expressed given that the future is not certain?

With regard to expressing the range of possible outcomes and identifying the likelihood of particular impacts, this Report takes a plain-language approach to expressing the expert judgment of the author team based on the best available evidence. For example, an outcome termed "likely" has at least a two-thirds chance of occurring; something termed "very likely," at least a 90 percent chance. In using these terms, the Federal Advisory Committee has taken into consideration a wide range of information, including the strength and consistency of the observed evidence, the range and consistency of model projections, the reliability of particular models as tested by various methods, and most importantly, the body of work addressed in earlier synthesis and assessment reports. Statements that are not qualified by such terms are deemed "virtually certain". Key sources of information used to develop these characterizations of uncertainty are referenced in endnotes. This approach is similar to that used in several of the SAPs.

How does this Report address incomplete scientific understanding?

This assessment identifies areas in which scientific uncertainty limits the ability to estimate future climate change and its impacts. The section on *Recommendations for Future Work* at the end of this Report highlights some of these areas.

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b. Information about the Climate Change Technology Program, and U.S. efforts to mitigate climate change can be found at *http://www.climatetechnology.gov/index.htm*.

c. Mitigation options are addressed in: SAP 2.1a—Scenarios of Greenhouse Gas Emissions and Atmospheric Concentrations; and, SAP 2.2.—The First State of the Carbon Cycle Report (SOCCR): The North American Carbon Budget and Implications for the Global Carbon Cycle.