

Synthesis and Assessment Product 4.3: The Effects of Climate Change on Agriculture, Land Resources, Water Resources and Biodiversity in the United States

Frequently Asked Questions

1. What is the *Synthesis and Assessment Product 4.3: The Effects of Climate Change on Agriculture, Land Resources, Water Resources and Biodiversity*?

Synthesis and Assessment Product (SAP) 4.3 is one of 21 synthesis and assessment products being produced by the U.S. Climate Change Science Program (CCSP). These reports are intended to summarize scientific understanding of various aspects of climate change for government and private sector decision-makers. USDA participates in the CCSP and is the lead agency for SAP 4.3.

2. Who contributed to this report?

A group of 38 authors from universities, USDA and other Federal agencies, national laboratories and research centers, and non-governmental organizations contributed to this report.

3. What sources of information are included in this report?

The report represents an evaluation and synthesis of existing science as reflected in the published peer-reviewed literature. SAP 4.3 includes more than 1,000 references.

4. What time horizon for climate change effects does this report consider?

The main focus of this report is the next 25 to 50 years. In a few cases, the report considers effects that occur over the rest of the century. This was done to focus on time periods that natural resource managers typically must consider in their day-to-day responsibilities.

5. What was the review process for SAP 4.3?

SAP 4.3 has been reviewed by an independent panel of scientific experts as well as scientific experts at Federal agencies, and underwent a 45-day public comment period in September and October, 2007. Comments from each of those reviews were considered in drafting the final report.

6. What are some of the report's initial findings?

The SAP 4.3 report provides a synthesis of available information about the effects of changing climate on agriculture, land and water resources, and biodiversity. SAP 4.3 documents current observations of climate-driven effects and discusses the implications of future changes on those systems. The effects are not expected to be uniform across the United States, as some resources and regions will be more vulnerable to climate change than others. It is clear that significant vulnerabilities exist in all the ecosystems covered by SAP 4.3. According to the report, effects in all these ecosystems are already being observed, and these trends are likely to become more pronounced over the next several decades.

The report concludes that climate change is already affecting U.S. water resources, agriculture, land resources, and biodiversity, and will continue to do so. Some agricultural and forest systems may experience near-term productivity increases. Over the long-term, however, many such systems are likely to experience diminished ecosystem services and the

need for changes to management regimes. Management of water resources will become more challenging. Increased incidence of disturbances such as forest fires, insect outbreaks, severe storms, and drought will command public attention and place increasing demands on management resources. Changes in season length and primary productivity, along with possible breakdowns in traditional pollinator/plant and predator/prey interactions, are stressing and altering current ecosystems.

7. Can current observation systems identify climate change effects on these resources?

SAP 4.3 finds that current observations are not fully adequate to predict, detect, or monitor the effects of climate change on ecosystems due to informational gaps, lack of integration, outdated technology, and design incompatibilities. However, a number of observing systems within the United States do provide information on environmental stress and ecological responses, and may be applied to the issues identified in SAP 4.3. Within USDA such systems include the forest and agricultural survey and inventories, the Snowpack Telemetry system (SNOTEL), and the National Integrated Drought Information System (NIDIS). Climate change is a primary consideration in planning for the Forest Service, Agricultural Research Service, and others.

8. What recommendations does the report make?

This report is an assessment of the state of the science and makes no recommendations. This is consistent with the other U.S. Climate Change Science Program's Synthesis and Assessment Product reports, according to the guidance provided to the report's authors.

9. What is USDA doing about climate change?

USDA is using the report's findings in the development of a new Strategic Plan for Climate Change research. The Forest Service is integrating climate change into National Forest Management Plans and is providing guidance to Forest Managers on how to respond and adapt to climate change. The Natural Resources Conservation Service and Farm Services Agency are encouraging actions to reduce greenhouse gas emissions and increase carbon sequestration through conservation programs. USDA's Risk Management Agency has prepared tools to manage drought risks, and is conducting an assessment of the risks of climate change on the crop insurance program. USDA is also providing guidance to landowners to enable them to estimate their greenhouse gas footprints.

10. For more information, please visit

- http://www.usda.gov/oce/global_change/,
- <http://www.climatescience.gov/Library/sap/sap4-3/default.php>, or
- <http://www.sap43.ucar.edu/>.