

U.S. CLIMATE CHANGE SCIENCE PROGRAM RELEASES REPORT ON THE EFFECTS OF CLIMATE CHANGE ON AGRICULTURE, LAND AND WATER RESOURCES AND BIODIVERSITY

The U.S. Climate Change Science Program (CCSP) has released "Synthesis and Assessment Product 4.3 (SAP 4.3): The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the United States." The CCSP integrates the federal research efforts of 13 agencies on climate and global change. Today's report is one of the most extensive examinations of climate impacts on U.S. ecosystems. USDA is the lead agency for this report and coordinated its production as part of its commitment to CCSP.

"The report issued today provides practical information that will help land owners and resource managers make better decisions to address the risks of climate change," said Agriculture Chief Economist Joe Glauber. The National Center for Atmospheric Research also coordinated in the production of the report. It is posted on the CCSP Web site at:

<http://www.climatescience.gov/Library/sap/sap4-3/default.php>

The report was written by 38 authors from the universities, national laboratories, non-governmental organizations, and federal service. The report underwent expert peer review by 14 scientists through a Federal Advisory Committee formed by the USDA.

The report finds that climate change is already affecting U.S. water resources, agriculture, land resources, and biodiversity, and will continue to do so. Specific findings include:

- Grain and oilseed crops will mature more rapidly, but increasing temperatures will increase the risk of crop failures, particularly if precipitation decreases or becomes more variable.
- Higher temperatures will negatively affect livestock. Warmer winters will reduce mortality but this will be more than offset by greater mortality in hotter summers. Hotter temperatures will also result in reduced productivity of livestock and dairy animals.
- Forests in the interior West, the Southwest, and Alaska are already being affected by climate change with increases in the size and frequency of forest fires, insect outbreaks and tree mortality. These changes are expected to continue.
- Much of the United States has experienced higher precipitation and streamflow, with decreased drought severity and duration, over the 20th century. The West and Southwest, however, are notable exceptions, and increased drought conditions have occurred in these regions.

- Weeds grow more rapidly under elevated atmospheric CO₂. Under projections reported in the assessment, weeds migrate northward and are less sensitive to herbicide applications.
- There is a trend toward reduced mountain snowpack and earlier spring snowmelt runoff in the Western United States.
- Horticultural crops (such as tomato, onion, and fruit) are more sensitive to climate change than grains and oilseed crops.
- Young forests on fertile soils will achieve higher productivity from elevated atmospheric CO₂ concentrations. Nitrogen deposition and warmer temperatures will increase productivity in other types of forests where water is available.
- Invasion by exotic grass species into arid lands will result from climate change, causing an increased fire frequency. Rivers and riparian systems in arid lands will be negatively impacted.
- A continuation of the trend toward increased water use efficiency could help mitigate the impacts of climate change on water resources.
- The growing season has increased by 10 to 14 days over the last 19 years across the temperate latitudes. Species' distributions have also shifted.
- The rapid rates of warming in the Arctic observed in recent decades, and projected for at least the next century, are dramatically reducing the snow and ice covers that provide denning and foraging habitat for polar bears.

USDA agencies are responding to the risks of climate change. For example, the Forest Service is incorporating climate change risks 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. For more information, please visit:

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