Annotated site map of USDA resources on climate change—an ongoing project

Climate Solutions link on the USDA Home Page

(Site map details in progress)

USDA Climate Hubs

(Site map details in progress)

USDA Climate Change Blog posts

(Site map details in progress)

Office of the Chief Economist

Climate Change Program Office

The Climate Change Program Office (CCPO) coordinates USDA's responses to climate change, focusing on implications of climate change on agriculture, forests, grazing lands, and rural communities. CCPO ensures that USDA is a source of objective, analytical assessments of the effects of climate change and proposed response strategies both within USDA and for our partners. CCPO is also responsible for coordinating activities with other Federal agencies, interacting with the legislative branch on climate change issues affecting agriculture and forestry, and representing USDA on U.S. delegations to international climate change discussions. CCPO's responsibilities include:

- Analysis, planning, research coordination, and the development of climate change response strategies;
- Providing liaison with other Federal agencies;
- Informing the Department of scientific developments and policy issues relating to the effects of climate change on agriculture and forestry, and recommending responsive courses of action; and
- Ensuring that recognition of the potential for climate change is fully integrated into USDA's research, planning, and decision-making processes.

I. EFFECTS—CLIMATE CHANGE REPORTS

USDA Releases Two New Reports on Climate Change--The reports below are a comprehensive syntheses of the scientific literature on climate change effects and adaptation strategies for U.S. agriculture and forests. Scientists from the Federal service, universities, non-governmental organizations, industry, tribal lands and the private sector contributed to the national stakeholder workshops and the peer-reviewed studies. The reports evaluate current conditions and look ahead to the next 25 to 100 years and the potential consequences of climate change.

Summary Report

Climate Change and Agriculture in the United States: Effects and Adaptation

Climate change effects over the next 25 years will be mixed. Continued changes by mid-century and beyond, however, are expected to have generally detrimental effects on most crops and livestock. As temperatures increase, crop production areas may shift to follow the temperature range for optimal growth and yield, though production in any given location will be more influenced by available soil water during the growing season. Weed control costs total more than $11 billion a year in the U.S.; those costs are expected to rise with increasing temperatures and carbon dioxide concentrations. Changing climate will also influence livestock production. Heat stress for any specific type of livestock can damage performance, production, and fertility, limiting the production of meat, milk, or eggs. Changes in forage type and nutrient content will likely influence grazing management needs. Insect and disease prevalence are expected to increase under warmer and more humid conditions, diminishing animal health and productivity.

FAQs

Full Report

Effects of Climatic Variability and Change on Forest Ecosystems

The ability of forests to provide essential services, such as clean drinking water, outdoor recreation, and quality wildlife habitat, will change, especially as populations grow and demands for these services increase. The most rapidly visible and significant short-term effects on forest ecosystems will be caused by fire, insects, invasive species, and combinations of multiple stressors, often occurring with increased frequency and severity. Although some regions will be affected more than others, these disturbances are likely to change the structure and function of ecosystems across millions of acres over a short period of time with detrimental effects on forest resources.

FAQs

Full Report

II. MITIGATION

The U.S. agriculture and forestry sectors can play an important role in limiting the build-up of greenhouse gases (GHG) in the atmosphere. Conservation and land management practices can reduce emissions of carbon dioxide, methane, and nitrous oxide associated with crop and livestock production; increase the quantity of carbon stored in soils and above ground vegetation; and generate renewable fuels that recycle carbon dioxide from the atmosphere.

Greenhouse Gas Inventory

CCPO works with USDA researchers and analysts from EPA and the Department of Energy to improve our ability to inventory and estimate GHG emissions and carbon sequestration from the local to national scales. Periodically, USDA produces an updated inventory of GHG emissions and carbon storage for the agriculture and forestry sectors. These reports are consistent with the annual emissions reporting done by EPA, but provide an enhanced view of the data regionally and by land use.

Greenhouse Gas Estimation

USDA is working on tools and methods that will assist farmers, ranchers and forest land managers in assessing their GHG footprint. These tools and methods will be useful for understanding the GHG impact of various management options.

Mitigation Technologies

Many land and animal management technologies and practices can help reduce GHG emissions. USDA provides information to help land managers assess which mitigation technologies and practices might be appropriate to their operation.

III. ADAPTATION

The effects of climate change are complex and far-reaching, and while the scope, severity, and pace of future climate change impacts are difficult to predict, it is clear that changes could have important effects on producers and on the ability of USDA to fulfill its core mission. Adaptation refers to the process of finding ways to prepare for and flexibly respond to changes in climate. USDA is developing a multi-pronged approach toward adaptation, including research, education, extension, risk management, and strategic planning. CCPO works across USDA to help ensure that climate change adaptation is integrated into USDA programs, policies and operations. CCPO also provides data, tools and information to assist land managers, stakeholders and USDA agencies and mission areas with adaptation assessments, planning and implementation.

USDA's Climate Change Adaptation Plan

The U.S. Department of Agriculture (USDA) Climate Change Adaptation Plan presents strategies and actions to address the effects of climate change on key mission areas including agricultural production, food security, rural development, and forestry and natural resources conservation. The 2014 USDA Climate Change Adaptation Plan includes input from eleven USDA agencies and offices. It provides a detailed vulnerability assessment, reviews the elements of USDA's mission that are at risk from climate change, and provides specific actions and steps being taken to build resilience to climate change. The plan advances President Obama's Priority Agenda and Climate Action Plan to integrate climate change adaptation planning into the actions of the federal government.

Full Plan

USDA's Policy Statement on Climate Change Adaptation (DR 1070-001) June 2, 2011

IV. GREENHOUSE GAS ESTIMATION

Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entry Scale Inventory.

America's farm, ranch and forest managers are stewards of the land, and have long recognized the significance of managing soil health, plant productivity and animal nutrition. Conservation practices and other management changes can reduce greenhouse gas (GHG) emissions and increase carbon storage while improving soil health, crop or livestock productivity, and resilience to drought and other extreme weather. This report lays out methods for estimating changes in GHG emissions and carbon storage at a local scale. The methods in the report will be used to develop user-friendly tools for farmers, ranchers, forest landowners and other USDA stakeholders to help them evaluate the GHG benefits of a wide variety of management practices.

Full Document

Executive Summary

Scientific Review of GHG Emissions Data

This December, 2011 Technical Report provides an extensive summary and synthesis of data related to estimation of GHG emissions and carbon storage.

Review of GHG Tools and Models

This February, 2012 Technical Report provides a synopsis and summary of over one hundred GHG estimation tools, models and methods that are available related to management activities across the agriculture and forestry sectors.

V. NATIONAL GREENHOUSE GAS INVENTORY

Periodically, USDA produces an updated inventory of GHG emissions and carbon storage for the agriculture and forestry sectors. These reports are consistent with the annual emissions reporting done by EPA, but provide an enhanced view of the data regionally and by land use.

USDA Greenhouse Gas Inventory 1990-2008

Climate Change Program Office, Office of the Chief Economist, U.S. Department of Agriculture. Technical Bulletin No. 1930. 159 pp. June 2011. In 2008, agricultural greenhouse gas sources accounted for about 6% of total U.S. greenhouse gas emissions. The U.S. Agriculture and Forestry Greenhouse Gas Inventory: 1990-2008 was developed to provide a comprehensive assessment of the contribution of U.S. agriculture and forestry to greenhouse gas emissions and carbon sequestration. It provides an in-depth look at greenhouse gas emissions and carbon sequestration at the state and regional scales.

The report was prepared with contributions from the USDA Agricultural Research Service, USDA Forest Service, USDA Natural Resources Conservation Service, USDA Office of Energy Policy and New Uses, USDA Climate Change Program Office, U.S. Environmental Protection Agency (EPA), and researchers at Colorado State University. The estimates in the USDA GHG Inventory are consistent with those published by the EPA in the official Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008 and submitted to the United Nations Framework Convention on Climate Change in April 2010.

VI. CLIMATE CHANGE SCIENCE PLAN

The U.S. Department of Agriculture (USDA) Climate Change Science Plan (the Science Plan) provides a guide for the Department and its stakeholders to enable clear and consistent consideration of current and potential investments in climate change science activities. This Science Plan presents an overview of the critical questions facing the Department's agencies as they relate to climate change and offers a framework for assessing priorities to ensure consistency with USDA's role in the Federal Government's broader U.S. Global Change Research Program (USGCRP) and related efforts. This document identifies important roles and responsibilities for USDA agencies and areas of needs and dependencies wherein USDA agencies are reliant on other programs for cooperation.

Science Plan

VII. CLIMATE CHANGE ACROSS USDA—AGENCY ACTIVIES

Climate Change Program Office
Fact Sheet

Office of the Chief Scientist
Climate Change White Paper

Agricultural Research Service
Climate Change, Soils and Emissions
Fact Sheet

US Forest Service
Office of the Climate Change Advisor

Climate Change Resource Center
Fact Sheet
USDA Forest Service International Programs—Climate Change and Forests

Foreign Agriculture Service
Fact Sheet

Farm Service Agency
Fact Sheet

Natural Resources Conservation Service
Climate Change
Fact Sheet

Economic Research Service
Climate Change
Fact Sheet

National Institute of Food and Agriculture
Global Change and Climate
Fact Sheet

Risk Management Agency
Fact Sheet

Animal and Plant Health Inspection Service
Fact Sheet

VIII. USDA REGIONAL CLIMATE HUBS

USDA's regional hubs will deliver information to farmers, ranchers and forest landowners to help them adapt to climate change and weather variability. The Hubs will build capacity within USDA to provide information and guidance on technologies and risk management practices at regional and local scales. To learn about how climate change and weather variability are affecting agriculture in your area, click on a region of the map above.