

CLIMATE CHANGE GLOBAL FOOD SECURITY AND THE U.S. FOOD SYSTEM

A S C I E N T I F I C A S S E S S M E N T

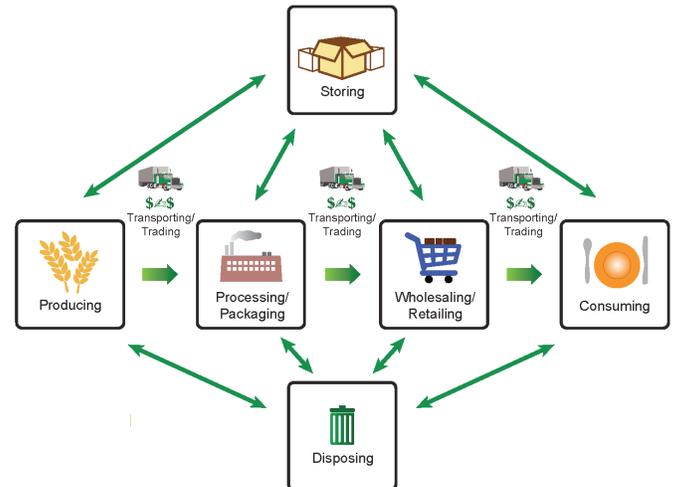
Food security - the ability to obtain and use sufficient amounts of safe and nutritious food—is a fundamental human need. Climate change is very likely to affect global, regional, and local food security by disrupting food availability, decreasing access to food, and making food utilization more difficult.

CLIMATE CHANGE IS LIKELY TO DIMINISH CONTINUED PROGRESS ON GLOBAL FOOD SECURITY.

Food security exists “when all people at all times have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life” and affects people through both under- and overconsumption. Food security requires that food be simultaneously (1) *available*—that it exist in a particular place at a particular time, (2) that people can *access* that food through economic or other means, (3) that people can *utilize* the food that is available and accessible to them, and (4) that each of these components be *stable* over time. Constrictions within any of these components can result in food insecurity.

Food is provisioned through a food system that manifests in diverse ways across the globe. The food system includes all activities related to producing, transporting, trading, storing, processing, packaging, wholesaling, retailing, consuming, and disposing of food. Whether an individual food system includes few, many, or all of these elements, each is susceptible to risks from a changing climate.

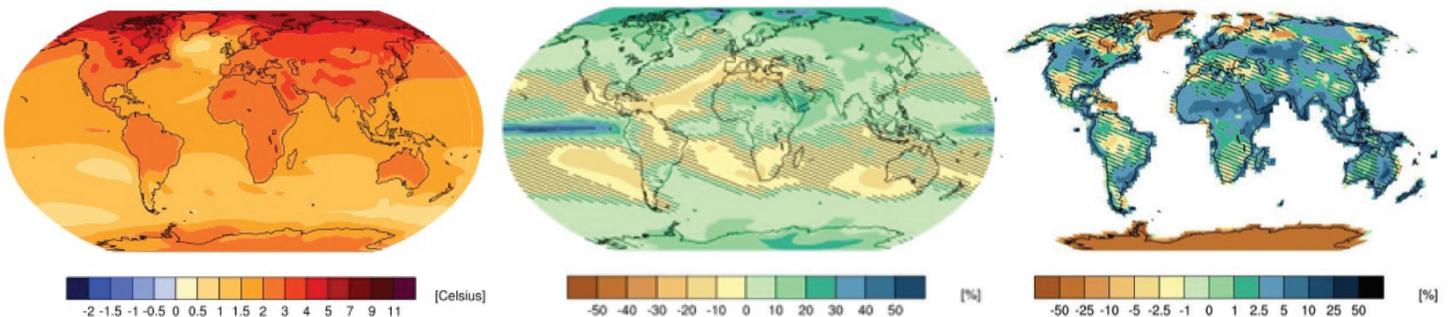
Human activities, such as burning fossil fuels and deforestation, have increased global greenhouse gas concentrations; atmospheric carbon dioxide levels have risen from 280 parts



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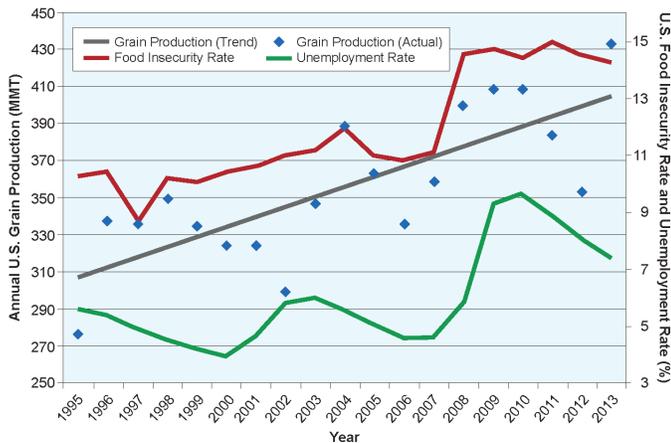
per million (ppm) in the late 1700s to today’s level of about 400 ppm. Concentrations continue to rise, though future levels depend on choices and development pathways yet to be determined. Additionally, the future condition of the food system depends upon socioeconomic trajectories that are external to the food system itself. For these reasons, a range of possible emissions futures and socioeconomic pathways have been considered by this assessment.

The *Climate Change, Global Food Security, and U.S. Food System* assessment represents a consensus of authors and includes contributors from 19 Federal, academic, nongovernmental, and intergovernmental organizations in four countries, identifying climate-change effects on global food security through 2100, and analyzing the United States’ likely connections with that world.



Projected changes global temperature, precipitation and soil moisture by 2050. (RCP 8.5)

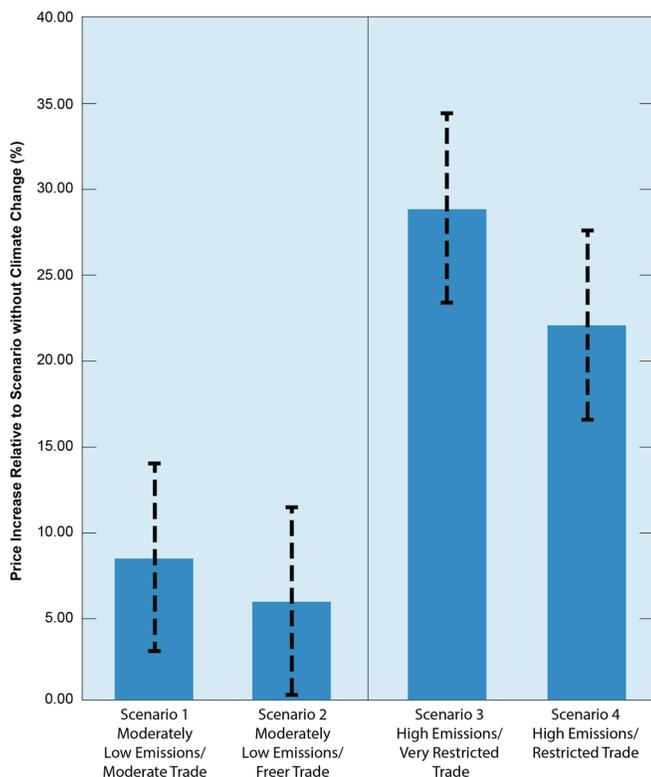
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Food availability and production increases alone do not necessarily determine food security status. For example, in this case, food insecurity is driven by economic conditions more than by food production.

Food Security and Global Climate Trends

The assessment finds that climate change is likely to diminish continued progress on global food security through production disruptions leading to local availability limitations and price increases, interrupted transport conduits, and diminished food safety, among other causes. The risks are greatest for the global poor and in tropical regions. In the near term, some high-latitude production export regions may benefit from changes in climate.



All scenarios to 2050 show increased prices due to climate change, with smaller price increases for lower emission scenarios (1 and 2) and freer trade scenarios (2 and 4). Dashed lines (---) represent the range of model results.

Effects in the US

As part of a highly integrated global food system, consumers and producers in the United States are likely to be affected by these changes. The type and price of food imports from other regions are likely to change, as are export demands placed upon U.S. producers and the transportation, processing, and storage systems that enable global trade. Demand for food and other types of assistance may increase, as may demand for advanced technologies to manage changing conditions.

Adaptation

Adaptation across the food system has great potential to manage climate-change effects on food security, and the complexity of the food system offers multiple potential points of intervention for decision makers at every level, from households to nations and international governance structures. However, effective adaptation is subject to highly localized conditions and socioeconomic factors, and the technical feasibility of an adaptive intervention is not necessarily a guarantee of its application if it is unaffordable or does not provide benefits within a relatively short time frame, particularly for smaller operations around the world with limited capacity for long-term investments. The accurate identification of needs and vulnerabilities, and the effective targeting of adaptive practices and technologies across the full scope of the food system, are central to improving global food security in a changing climate.



Changes in environmental and socioeconomic conditions can affect food security in locations that are distant from the original shift or disturbance.

For More Information, please see the full report at:
www.usda.gov/oce/climate_change/FoodSecurity.htm

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