

# NOAA's National Climatic Data Center Sectoral Engagement Fact Sheet

## AGRICULTURE

### OVERVIEW

A wide range of crops and livestock are grown in different climates and regions. In all areas, climate and weather conditions affect every aspect of agriculture. Seasonal temperatures and precipitation amounts determine what kind of crops will grow well and when they should be planted. Extreme weather-related events such as heat waves, cold snaps, severe storms, flooding, and drought can affect crop yields and livestock health and performance. Some of the factors that increase environmental stress on crops, such as drought or warmer temperatures, make crops more vulnerable to disease and attack by insects and plant pathogens. Gradually increasing temperatures due to climate change can cause an expansion of weeds and other invasive species into higher elevations and higher latitudes. Having access to relevant and easily understandable weather and climate information is essential to effectively managing and optimizing agricultural production.



### KEY STAKEHOLDERS

NOAA's National Climatic Data Center (NCDC) works with various groups, both as an information provider and as an applied research partner, to examine the effects of weather and climate on agriculture. This helps farmers and other decision makers within the agriculture sector make practical and profitable responses to climate changes and variations. There are many different governmental and non-governmental organizations, public and private groups and businesses, and individuals that can benefit from using pertinent climate and weather-related information. Some major groups include:

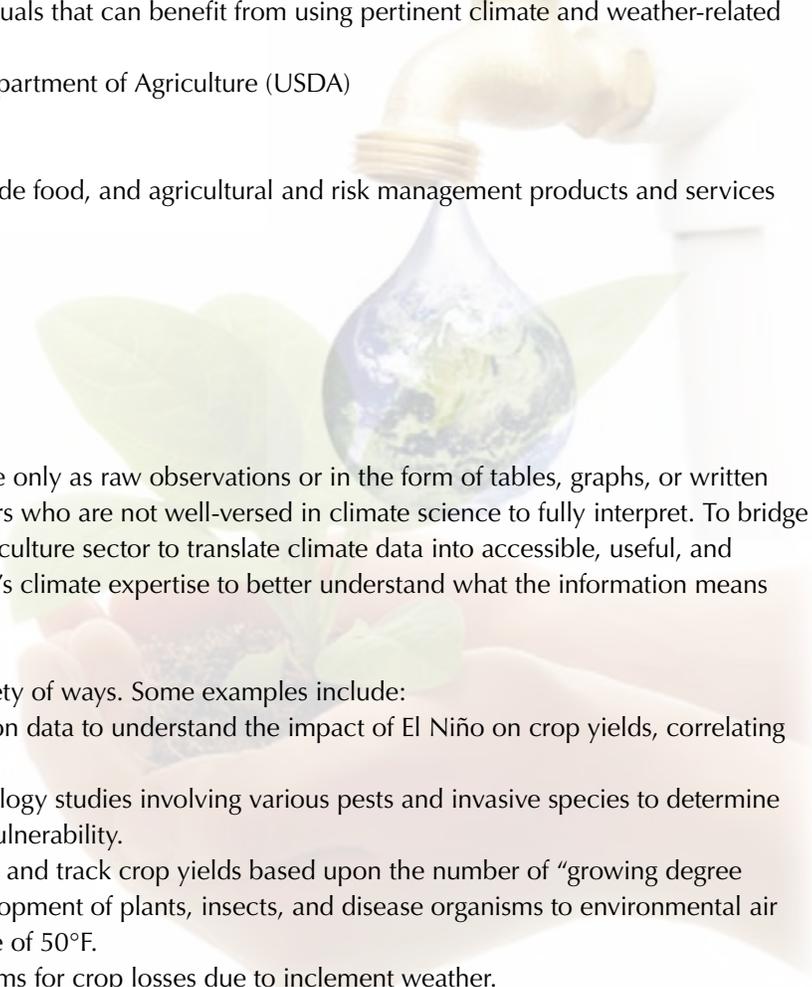
- Federal agencies, such as the U.S. Department of Agriculture (USDA)
- State agricultural extension offices
- Academia and other researchers
- Corporations, such as those that provide food, and agricultural and risk management products and services
- Water resource managers
- Seed companies
- Farmers
- Entomologists
- Agrometeorologists

### SECTOR NEEDS

Climate information is often available only as raw observations or in the form of tables, graphs, or written summaries, which may be difficult for users who are not well-versed in climate science to fully interpret. To bridge this gap, NCDC is partnering with the agriculture sector to translate climate data into accessible, useful, and accurate products; and to leverage NCDC's climate expertise to better understand what the information means and how it can be used most effectively.

Climate information can be used in a variety of ways. Some examples include:

- Using monthly and annual precipitation data to understand the impact of El Niño on crop yields, correlating rainfall with production.
- Using meteorological data for entomology studies involving various pests and invasive species to determine conditions most conducive for crop vulnerability.
- Using daily climate records to analyze and track crop yields based upon the number of "growing degree days"—an index that relates the development of plants, insects, and disease organisms to environmental air temperature, using a base temperature of 50°F.
- Using climate data to substantiate claims for crop losses due to inclement weather.



## NCDC DATA and PRODUCTS

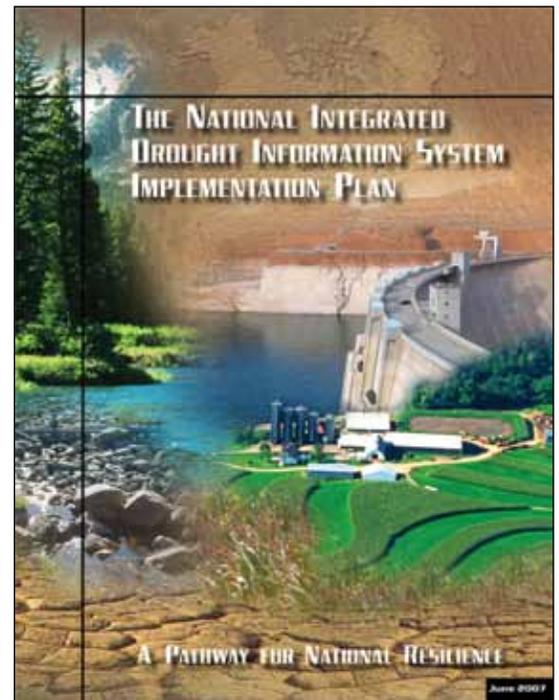
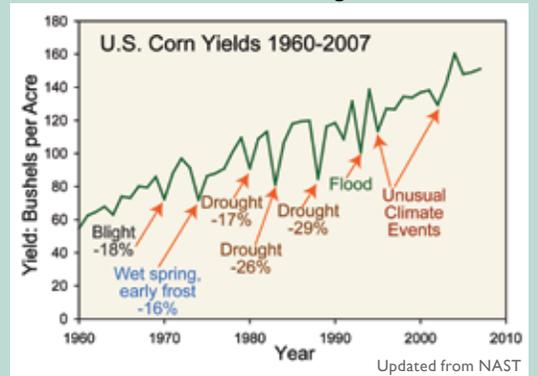
There are many different types of useful climate information available. Some examples include:

- A *Vegetation Index*, which is used to predict or assess vegetative characteristics such as plant leaf area, total biomass, and general health and vigor of the surface vegetation.
- A *Crop Moisture Stress Index*, which is a measure of the effects of drought and catastrophic wetness on national crop yields.
- The *U.S. and North American Drought Monitor*, which synthesizes multiple indices and impacts, representing a consensus of federal and academic scientists.
- The *National Integrated Drought Information System (NIDIS)*, which is a web portal-based multi-agency collaborative system that provides information about current drought conditions and impacts, and drought forecasts, planning, education, and research.
- CD-ROM/DVDs, such as the *International Station Meteorological Climate Summary*, which contains climatic data summaries from thousands of weather stations around the world, and *Integrated Surface Data* database, which contains climate information for about 10,000 weather stations, with some dating as far back as 1901.
- Publications, including *Local Climatological Data* (provides a monthly summary of daily observations), *Climatological Data* (provides annual average values), and *Comparative Climatic Data* (provides average and extreme values).

Collaboration between climate scientists and the agriculture community is essential in helping to build the necessary bridges that will transform climate data into information that is relevant and credible. Ongoing communication is important to ensure that the information NCDC provides is appropriate and applicable to agriculture sector needs. As climate changes in the years ahead and the effects become more noticeable, new information needs will emerge. NCDC will work closely with this sector, attending trade meetings and sponsoring future workshops and conferences, in order to better understand, address, and anticipate these needs.



Corn Yields Through 2007



Additional details about available NOAA products and the economic benefits of these products are provided at:  
<http://www.economics.noaa.gov>

For further information on obtaining NCDC climate services and products related to agriculture please contact:

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