Sectoral Information

AGRICULTURE

At a Glance

- **NOAA National Centers for Environmental Information (NCEI) offers relevant climate and weather data, products, and services from NOAA satellite, radar, and in situ observing systems that allow farmers to optimize operations and manage environmental risks.**
- **The productivity of America's farms is influenced by a range of environmental factors including climate change and extreme events such as drought, floods, and storms.**
- **NCEI's data-driven products and information help farmers make informed and economically optimal decisions and have billions of dollars of impact on the U.S. economy and federal aid allocation.**

Sector Overview

U.S. agriculture, food, and related industries, contribute $992 billion to the U.S. Gross Domestic Product (GDP) (2015), generate employment across industries, meet domestic and international food demand, and satisfy food preferences.

The productivity of these industries, and the billions of dollars associated with revenue generation is influenced by a range of environmental factors. A changing climate can cause pest or weed expansion, while extreme weather events such as droughts, floods, severe storms, cold snaps, and heat waves can affect crop yields and livestock health and performance.

NCEI offers a range of products that are used by stakeholders across the sector, from farmers to equipment companies to manage risk and optimize operations through informed decision-making.

"… because of the Drought Monitor, we were able to go through the 2017 drought and have it be a positive things instead of a negative event, both economically and probably more importantly as far as being able to manage our grasslands … which is so important as far as being in business next year."

– Jim Faulstich, Cattle Rancher and Natural Resource Manager, Highmore South Dakota

Select Applications of NCEI's Data in the U.S. Agricultural Sector

Drought Management

Drought is an insidious phenomenon of nature that causes stress to natural resource-dependent sectors including livestock management and forage production. Under the U.S. Department of Agriculture (USDA), the Farm Service Agency's Livestock Forage Program (LFP) provides relief to ranchers who have suffered drought-related grazing losses.

To determine relief allocation, the FSA relies on the USDM's weekly composite drought map and severity rankings. The USDM is developed through a cooperative effort between NOAA, the USDA, the Regional Climate Centers, and the National Drought Mitigation Center (NDMC).

Under NOAA, NCEI provides several climatological inputs that are ingested into the USDM in addition to three of about a dozen alternating authors. Since its inception in 2014, the LFP program has paid out over $6 billion in relief to eligible ranchers, allowing them to purchase supplemental feed and sustain their herds. The USDM has made relief allocation expedient, timely, and less bureaucratic for both the agency administering the aid, and the rancher receiving the aid.

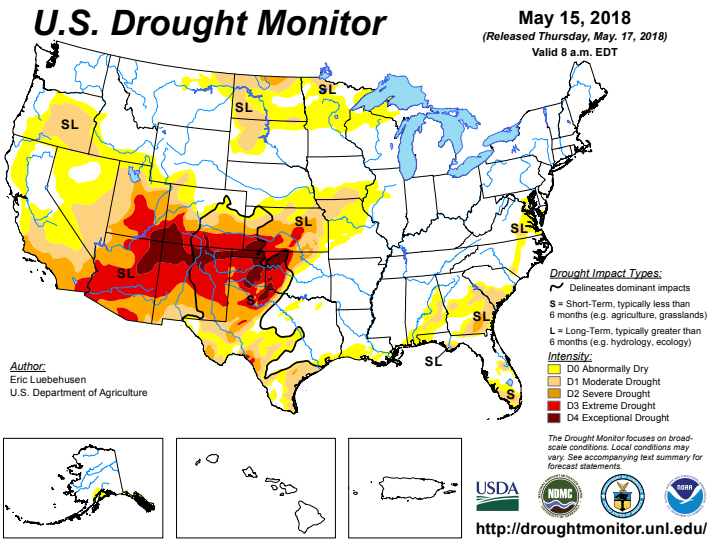

Image: The U.S. Drought Monitor (USDM) is an online drought-monitoring map and accompanying narrative summary that tracks the magnitude, spatial extent, and probability of occurrence of drought across the United States.

Nitrogen Management

While nitrogen fertilizer is a critical input for corn production, excess application does not contribute to improved crop growth resulting in unnecessary expenditures and environmental externalities (i.e., leaching into waterways, contributing to downstream algae blooms, emission as a greenhouse gas).

Adapt-N, a precision nitrogen management tool developed in collaboration with Cornell University and NOAA Northeast Regional Climate Center, relies on NCEI's localized and near-real-time temperature and precipitation records to provide a farm-specific nitrogen recommendation for corn growers. Cornell research (2015) shows that using Adapt-N results in average savings of $30 per acre through increased yield or reduction of costly nitrogen inputs.

If nitrogen management tools were used across the 90 million acres of U.S. corn fields, a savings of about $3 billion could be realized. Data-driven nitrogen management tools provide direct benefits to corn growers through cost savings as well as broader social and environmental co-benefits, such as reduced contribution to hypoxia or "dead zones" in the Gulf of Mexico.

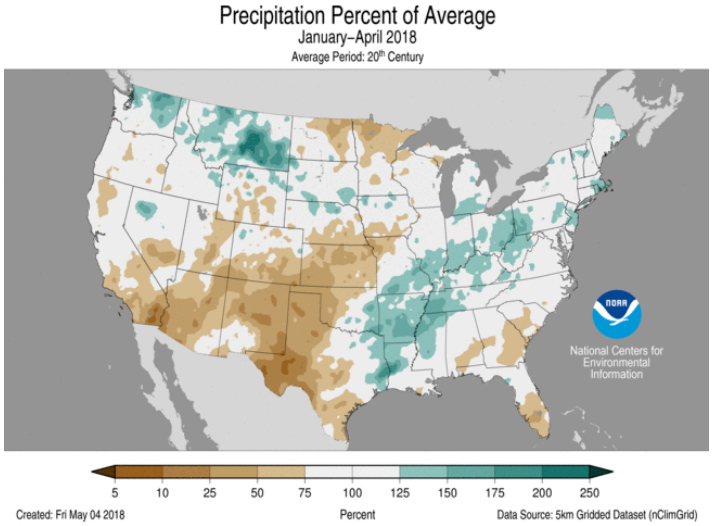

Image: Adapt-N relies on temperature and precipitation data from NCEI's Global Historical Climatology Network, Daily (GHCN-D). GHCN-D is a global land-based (in-situ) database that collects observations from a number of different observing networks.

NOAA National Centers for Environmental (NCEI), part of the U.S. Department of Commerce, provides access to one of the most significant archives of comprehensive oceanic, atmospheric, and geophysical data on Earth. From the depths of the ocean to the surface of the sun and from million-year-old ice cores to near-real-time satellite images, NCEI hosts over 37 petabytes of data. Public and private sectors rely on NCEI's authoritative and trusted information to create economic opportunity, mitigate climate- and weather-related losses, and preserve ecological resources.

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