



How Open Source Might Help the Midwest Recover From Drought

BY BAILEY MCCANN | Wednesday, October 24 2012

It might go without saying that the Midwest is experiencing the worst droughts in decades. During the 2012 crop year, USDA has given secretarial disaster designations to more than 2,300 out of 3,000 counties in the region due to drought. As a result, federal, state and local agencies are coordinating a national response effort that is leveraging precision agriculture technology to understand what is happening on the ground. Now, they're hoping that the open-source community can build on many of the same platforms already used in farming to help the region deal with the aftermath of this year's uncommonly bad weather.

Farming in the United States has been a high-tech endeavor since the early 1980s. Farmers use GPS and Global Navigation Satellite System technology to automate much of the farming process. They take aerial imagery into account when deciding what to plant, where to plant it, and how to keep it fertilized, irrigated, and pest-free. Farm equipment that is capable of using this technology can adjust its output based on the data coming in, as it is in motion.

"I've been farming for almost 40 years and in the last 15 years technology has really ramped up - the last five years especially," said Larry Oltjen, a farmer from Robinson, Kansas. "I imagine it will keep coming faster. In the next two to three years we will likely be farming with a planter that can adjust to soil variations as you move through the field."

Beyond building better crops, precision farming also helps with water management and environmental sustainability – two issues that have become significantly more important in light of two years of drought conditions. The West and Central Plains have been focused on water management for the last few decades, given their more arid climates, but the drought took these efforts to a new level.

Agribusiness is leveraging technology such as mobile GPS devices to provide crop data. These devices, made by crop technology integrators, are small, attachable touch screens – think Garmin, but for a tractor. Intra-field variations are recorded and shown through these devices so that farm equipment can adjust its response accordingly. Their handheld counterparts provide GPS data, include cameras, and the ability to take soil samples and record them in-field.

These capabilities are especially important during a drought as they enable farmers make hard decisions about where to put their scarce resources. "We have been lucky to get some rain in August and September, and we work on a no-till situation so we won't be positioned as badly and we will be able to get fertilizer on, but those folks who haven't had the rain yet and won't be able to fertilize, they're going to have some issues," Oltjen says. No-till farming means that a farmer won't turn the soil under as often, preserving moisture.

The GPS data that these services rely on comes primarily from three federal agencies, the [Earth Observatory program](#) at NASA, National Oceanic and Atmospheric Administration, and the Department of Agriculture. NASA and NOAA offer aerial satellite coverage of acreage, while USDA has become a leading innovator in the use of GIS mapping, powered by ESRI. USDA works especially close with state and local agriculture offices and farmers themselves.

"USDA has state and county offices who coordinate activities and support to customers nationwide," says Amanda Eamich, director of web communications at the USDA. "Our officials have fanned out to drought-affected states as part of a total U.S. government effort to offer support and assistance to those impacted by the drought. We also work closely with State and local offices and their officials on the drought effort, like governors, who are involved in state-specific response and recovery activities," Eamich says.

To that end, the agency recently announced a code sprint through [challenge.gov](#) which is seeking immediate help from developers nationwide to craft technology solutions that will ensure farmers disaster claims, drought information and agriculture management issues are addressed in a timely manner. The sprint is the most recent part of a broad-based [digital strategy](#) announced by the agency earlier this year.

"As individuals in communities across the country are seeking support, we wanted to reach out to the developer community to use publicly available government information to help farmers, ranchers, and others gain quick and reliable "one-click" access to information on drought conditions and Federal drought relief programs and efforts," says Eamich.

The code sprint was originally announced with a deadline of October 5, 2012, but the agency has extended it to October 24, 2012 after feedback from developers seeking longer than one month to get their applications together. USDA has opened up a number of datasets in order to get enough information to developers to create meaningful applications, including: USDA Secretarial County Disaster Designations; Monthly Crop Production Reports; Weekly Crop Progress and Condition Reports; Hay Stocks, and the National Integrated Drought Information System.

"One of the datasets we're encouraging developers to use is our USDA Service Center locator, which has the office profile for each USDA state and county service center. We'd love to see a tool incorporate this information and make it easier for customers to find their nearest service center," she says.

USDA has also launched [a website](#) dedicated to pulling in drought information from all of the

agencies involved so that farmers and ranchers can find out what is available to them in terms of programs and support. "We are involved with the farm program so we work with the FSA (Farm Service Agency) here in Hiawatha," Oltjen says. The FSA provides a variety of services including loans and is often the local face of USDA.

Many farmers have recently adopted a 300/100 yield initiative, which essentially requires a brutal assessment of crop areas to determine how they can maximize yield per acre and also which areas to pull resources away from if they aren't going to produce, even in the best of conditions. In some cases, farmers have changed what crops they plant where, while others have actually changed where they farm in order to deal with changing climate conditions.

USDA and farmers alike have been leveraging dynamic mapping and GIS services like those provided by ESRI in order to meet increased yield goals and respond to extreme climate change. USDA hopes that by bringing in the open source community they can make the range of options available better.

"We hope that by reaching out to communities who may not already be familiar with the ag sector, we can help raise awareness of the Sprint and the opportunity to help farmers, ranchers, small businesses and communities who are being impacted," Eamich said.

The code sprint ends today at 5 p.m. Earlier contributors can still amend their applications by contacting USDA.

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