

NASA Goddard to bring satellite data to African agriculture

April 29 2014



Teaming up with an African agriculture organization, NASA Goddard researchers aim to bring satellite data on precipitation, vegetation health and more to the cell phones of thousands of farmers, food distributors and others in 17 African countries. Credit: Alliance for a Green Revolution in Africa

From hundreds of miles in orbit, NASA satellites can measure how much rain falls in Niger or detect plant health in Mali. But on the ground, many African farmers and food distributors don't have good information about the growing conditions a few dozen miles down the

road.

A new program is bringing together scientists in two branches of NASA's Goddard Space Flight Center in Greenbelt, Md., as well as an African non-profit organization in order to get relevant satellite data in the hands – and cell phones – of people who could use it the most. The program, funded by the Advanced Collaborative Connections for Earth Systems Science program, will build on two technologies developed at Goddard to help scientists collect and track data, called LabNotes and FieldNotes.

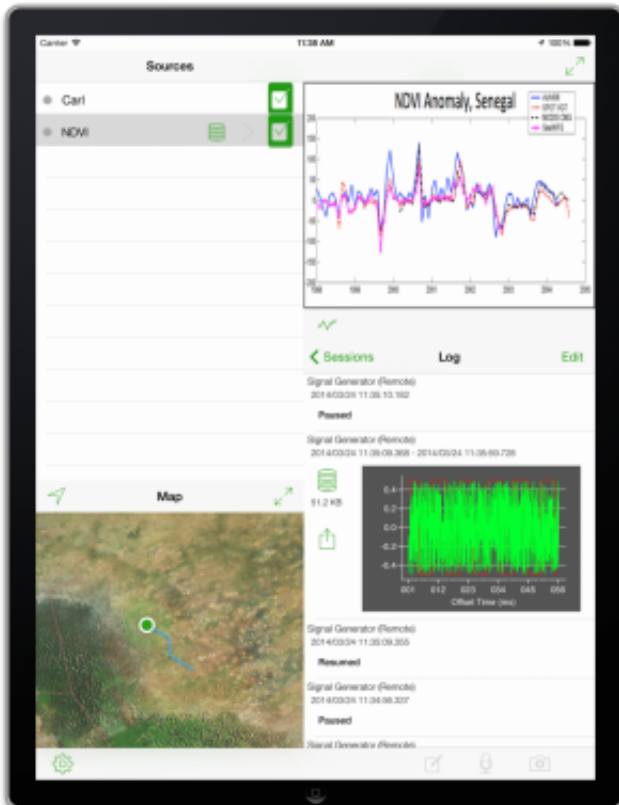
"Putting the information in the hands of the agriculture users is one of the many ways that we can show that the satellite data has benefits to society," said Molly Brown, a research scientist with Goddard's Biospheric Sciences Laboratory.

Brown and her colleagues have already developed a 30-year dataset of satellite information on African precipitation rates, vegetation health, soil moisture and evapotranspiration – all indicators of crop health in a given area. With researchers from Columbia University, N.Y. she is developing a system that can improve the way insurance companies set rates for drought protection.

That data, however, would also be key information for local farmers and food distributors who have to determine which regions have a surplus of maize, millet, rice and more – and therefore which regions they should focus on to purchase excess food to sell at central markets. When distributors can buy excess food, it can encourage farmers to grow more in good years, knowing that there is a market. More food production, and more efficient distribution, could improve food security for the region.

"All the background has been done, we need to write an application that

can go on a [cell phone](#)," Brown said. "You put it your latitude and longitude, and it'll tell you whether or not it rained last week, if it's above or below average... The question is, how is this year progressing compared to previous years. That is exactly the information people want."



Goddard computer engineers are developing a web and cell phone application that will display information from NASA satellites and other sources useful to African farmers and food distributors. Credit: NASA

After a chance meeting with a representative of the African-based organization AGRA, or the Alliance for a Green Revolution in Africa, Brown started looking for ways to get satellite data to farmers and

distributors through the mFarms platform. mFarms provides agricultural information via cell phones to their network – 80,000 farmers and thousands of other distributors, warehouses and more in 17 African countries.

Agriculture in sub-Saharan Africa consists mostly of small farms, said Matieyedou Konlambigue, program officer with AGRA. The mFarms platform connects farmers with marketing agents and buyers, creating a database of how many acres farmers plant, tracking the productivity of fields and more. With NASA satellite data, the program can expand to include growing conditions for specific locations, and notifications of potential weather-related problems.

"The collaboration with NASA will be revolutionary," Konlambigue wrote in an email. "The geo-physical data will be processed into useful information and channeled through [mobile devices] to agricultural value chain actors in order to improve their planning and decision making."

To make this happen, Brown recruited Goddard's Science Data Processing branch to work with mFarms and reach their network of farmers and distributors. Two projects already under development with Internal Research and Development (IRAD) funds could help with the effort, said Tom Flatley, the branch head. One, called LabNotes, is an app for mobile devices that connects to a data-gathering instrument. LabNotes can both send commands to the instrument, and log and compile the data it receives. The second project is called FieldNotes, an app that collects and displays information from a variety of pre-set sources – data from field instruments, pictures that others have shared, weather information, and other inputs depending on user need. Goddard computer engineers Troy Ames and Carl Hostetter developed the programs, in which users can also log their own observations.

"If they were getting soil moisture data from the satellites, and some

different gauges in their fields, the weather data coming in and somebody else's observation from a farm a couple miles down the road," Flatley said, "this could tie all that together."

Jeff Hosler, a supervisory computer engineer at Goddard, will work with the mFarms team to determine what technological capabilities and infrastructure their network of farmers and distributors have, what specific kinds of information will be most useful.

"It's rewarding that while we're working on these scientific applications for FieldNotes, this app could also be applied to people's everyday lives," Hosler said. "For some people, their livelihood depends on a lot of this kind of information."

The project is also a way to provide information to countries that helped provide the ground validation essential for researchers, Brown said. Researchers in Africa have provided on-the-ground measurements of rain and [soil moisture](#), but the analysis of the [information](#) often doesn't come back to agriculture organizations and meteorologists.

"It's really important we do a good job transferring the benefits of [satellite data](#) to people in Africa," she said.

Provided by NASA's Goddard Space Flight Center

Citation: NASA Goddard to bring satellite data to African agriculture (2014, April 29) retrieved 7 August 2024 from <https://phys.org/news/2014-04-nasa-goddard-satellite-african-agriculture.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--