

# Transforming Global Food Systems: New Geospatial Innovations Aim to Combat Hunger and Support Agricultural Stability

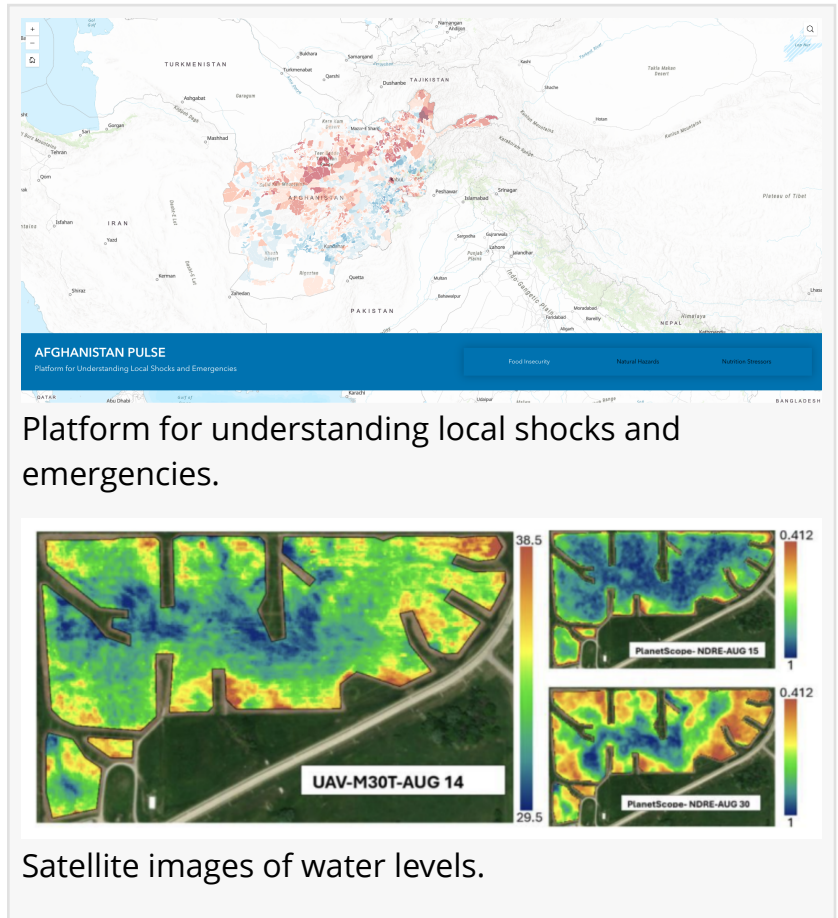
*Strategic Funding Bridges the Gap Between Data and Real-World Action*

ST. LOUIS, MO, UNITED STATES, May 27, 2026 /EINPresswire.com/ -- A new suite of geospatial innovations designed to turn data into actionable intelligence for global food systems was announced today. The Geospatial Innovation for Food Security (GIFS) Challenge has selected three project awardees to develop tools that will aid humanitarian agencies, governments, and agricultural specialists to navigate the complexities of agricultural production, climate variability, and supply chain disruptions.

Launched by Taylor Geospatial, a nonprofit organization focused on advancing geospatial artificial intelligence (GeoAI) for global public benefit, the GIFS Challenge addresses a critical gap in technologies to address food insecurity. While geospatial research is abundant, it often does not align with the problems those on the front lines actually face and stops short of providing usable tools.

“These projects prioritize execution over theory, ensuring that the work functions under the real-world constraints of time, scale, and uncertainty,” said Rachel Opitz, GIFS program manager at Taylor Geospatial. “The GIFS awardees are not just producing research; they are building tools that can be used to manage resources more efficiently and that humanitarian teams in conflict zones can use to identify food system risks before they become crises.”

The selected projects, chosen through a competitive process with external expert review, include:



Platform for understanding local shocks and emergencies.

Satellite images of water levels.



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*Rachel Opitz*

## EARLY WARNING SYSTEMS FOR HUNGER & MALNUTRITION

The United Nations World Food Programme, in partnership with the REACH Initiative, is developing Afghanistan’s PULSE platform (Platform for Understanding Local Shocks and Emergencies). The system tracks hazards affecting food access and supply routes, helping responders plan in environments where ground-level data is often incomplete.

This includes combining climate, food security, nutrition and market data to give a complete picture of the on-ground realities.

“AF-PULSE reduces the risk of hunger and malnutrition escalating into famine-like conditions during conflict and disasters by helping prioritize limited resources and reaching communities sooner – ultimately saving lives,” said Raul Cumba, Head of Research, Assessment and Monitoring for WFP Afghanistan. “It is a gamechanger for disaster risk reduction and preparedness, providing crucial insights tailored to local contexts.”

By integrating information and community feedback with GeoAI models trained by rapid assessment feeds, the system can forecast supply chain disruptions and identify alternate transport routes to ensure timely humanitarian response. The researchers’ work focuses on Afghanistan; however, their methodology and outcomes can serve as a template for other countries facing conflict.

## PREDICTING FOOD SYSTEM INSTABILITY

A collaboration between Arizona State University, the University of Maryland, and Washington University in St. Louis—alongside partners NASA Harvest, NASA’s Goddard Space Flight Center, and the Famine Early Warning Systems Network (FEWS NET)—is developing a GeoAI capability to identify early signals of instability in food systems.

“Decision-makers often have to assess food security risks with limited and delayed information about what is happening on the ground,” said Inbal Becker-Reshef, Director of NASA Harvest. “By generating more timely and transparent information, it will help address critical gaps and support organizations working to anticipate emerging food security risks.”

The system aligns in-season satellite-based embeddings with natural-language queries, enabling users to generate accessible, question-driven insights while explicitly communicating uncertainty. For example, a FEWS NET analyst could ask, “Which fields have been prepared?” The tool would generate a map showing likely prepared fields and provide an estimate, such as “about 80% of fields appear prepared,” along with an indication of how confident the system is in that estimate. The framework is designed to lower technical barriers and accelerate innovation

across the GeoAI and food security communities.

The project team plans to test the open-source tool in active conflict regions, including Sudan, Ukraine, Syria, and Haiti; however, like AF-PULSE, their findings will be applicable to any active conflict region.

## PRECISION AGRICULTURE

Led by researchers at the University of Missouri in partnership with the MU Extension, this project focuses on “water first” GeoAI model development to improve nitrogen application decisions. By combining satellite imagery and machine learning, the team maps plant-available soil water at sub-field scales. This allows agronomists, farmers, and developers of variable rate application plans to make more accurate nutrient application decisions based on water availability.

“There are no reliable tools that dynamically update estimates of crop nitrogen needed throughout the growing season based on local conditions,” said project lead Tim Haithcoat, Associate Professor in Data Science and Analytics, MU Institute for Data Science and Informatics. “Advancing a system that does that is a win for everybody – better harvests, fewer inputs, healthier ecosystems.”

The initial open-source model is being developed for rainfed arable farms in the US Midwest, focused on claypan soil regions in Missouri and Iowa, and is designed to be adaptable to regions with similar agricultural systems and soils globally.

"What excites us most is that this model doesn't need to stay proprietary or locked to one region," said Jasmine Neupane, Assistant Professor of Agricultural Systems Technology at the Digital Agriculture Research and Extension Center. "By designing it to travel—to adapt to different soils and seasons—we're building something the global agricultural community can eventually use for precision agricultural management."

The GIFS Challenge awardees represent Taylor Geospatial’s commitment to collaborative innovation, pairing world-class researchers with the practitioners responsible for global food security. All initiatives will now move from the proof-of-concept phase toward full operational deployment during an 18-month period. Each team will receive up to \$550K in funding as well as expert guidance and support.

For more information, visit the [Taylor Geospatial website](#), the [digital press kit](#), and [The State of GeoAI](#) report.

## About Taylor Geospatial

Headquartered in St. Louis, Taylor Geospatial is a nonprofit organization focused on advancing geospatial artificial intelligence (GeoAI) for global public benefit. The organization partners with

academic researchers and industry leaders to translate breakthrough geospatial research into accessible tools, datasets, and shared infrastructure. Through this work, Taylor Geospatial supports the development and deployment of digital public goods that help innovators and communities address complex global challenges. For more information, visit [taylorgeospatial.org](http://taylorgeospatial.org).

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