NASA Acres

NASA's U.S. agriculture consortium

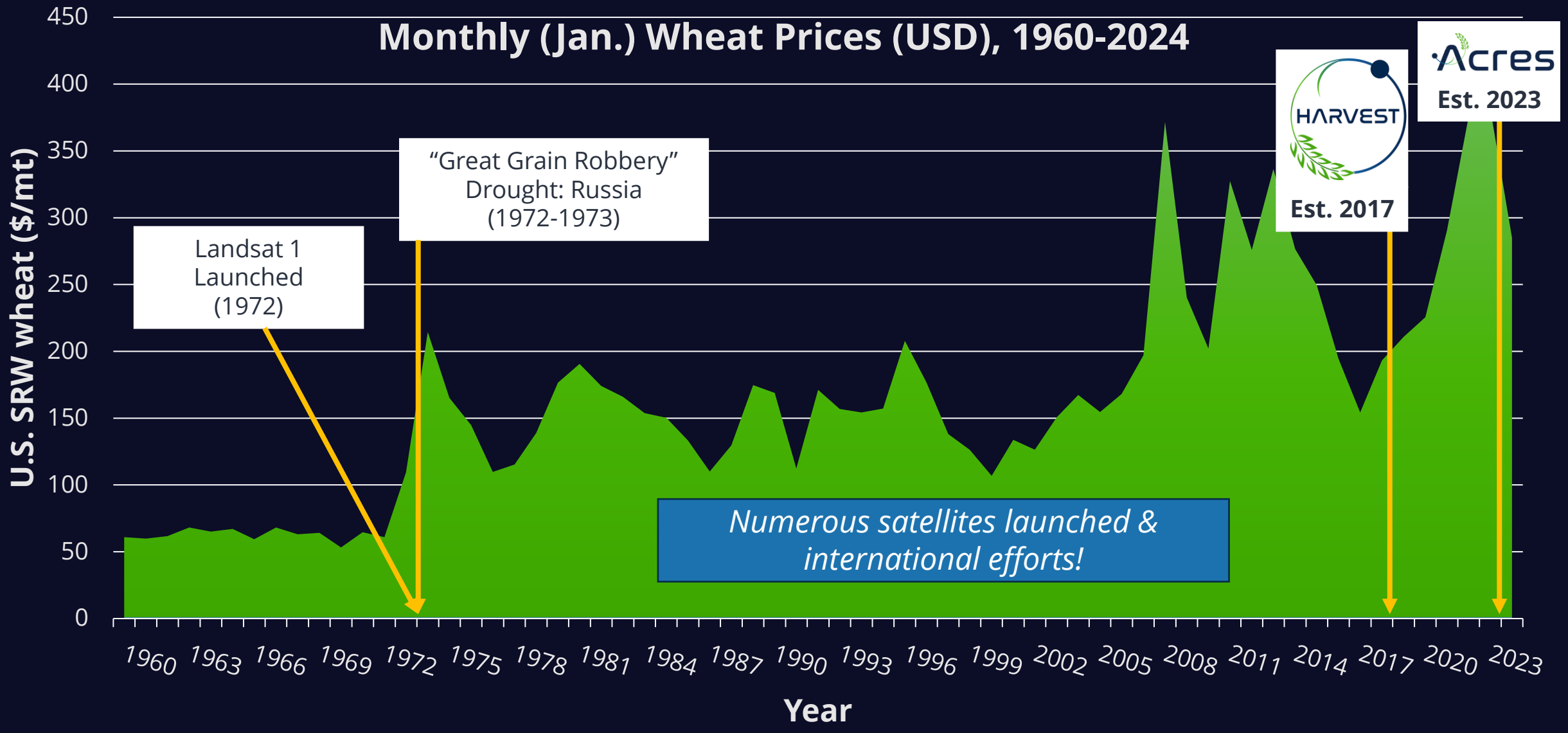
Allison Bredder

February 26, 2026

NASA WWAO "Connecting the Drops" Webinar

UNIVERSITY OF MARYLAND

A little history



Acres

Source: World Bank Commodity Price Data

Acres

est. 2023

NASA Acres is NASA's consortium focused on U.S. agriculture.

Our Mission:

Bridge the gap from space-to-farm and education-to-impact together with U.S. farmers, ranchers, and other agrifood system decision makers.

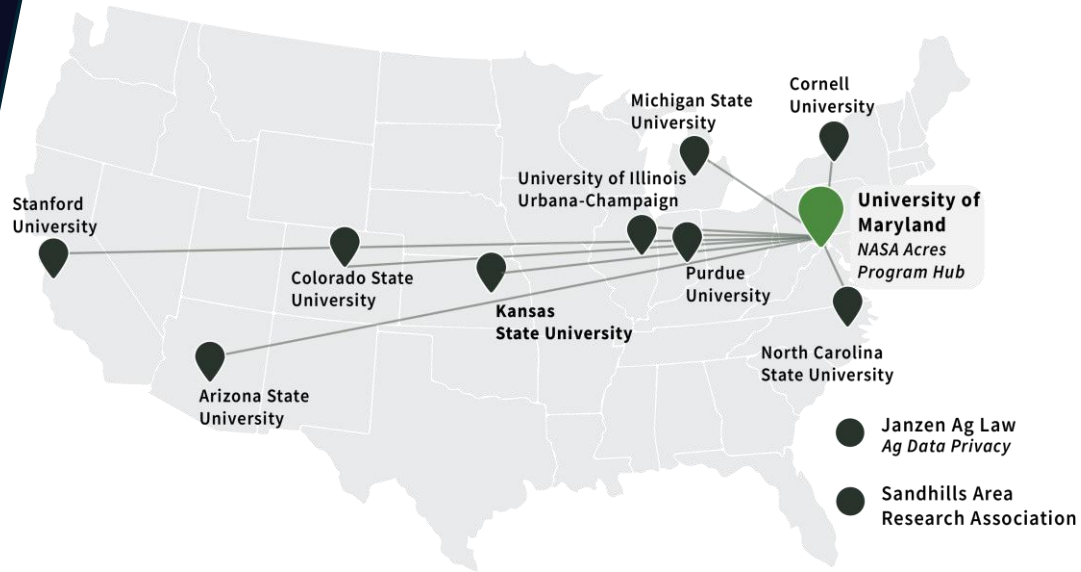
Richer knowledge

More & Better Tools

Stronger Workforce

We are a Consortium of public and private sector organizations led by the University of Maryland, on behalf of NASA.

12 organizations lead projects with >70 partners








How We Partner

- ▸ **People/orgs fund us (Sustaining & Supporting)**
- ▸ **We fund people/orgs (RD&E)**
- ▸ **We exchange in kind:** data / effort / expertise, etc. **(Collaborating)**
- ▸ **We go for new funding together (become RD&E)**

Our Partners

Sustaining

NASA

Supporting

National Sorghum Producers · USB United Soybean Board · USSEC U.S. Soybean Export Council · General Mills · Unilever

Research, Development, & Extension

University of Maryland · Department of Geographical Sciences · Cornell University · Purdue University · University of Illinois Urbana-Champaign · Janzen Ag Law · NC State University · K-State · Michigan State University · Stanford University · Arizona State University · SARA · Colorado State University

Collaborating

American Farm Bureau Federation · ILCORN Growers Association · Illinois Farm Bureau · Iowa Corn · ASA American Soybean Association · Sorghum Checkoff · Cotton · E&J Gallo Winery · JW Ranch · Brander Winery & Vineyard · National Association of Conservation Districts · NRCS · USDA Agricultural Research Service · NASA Marshall Space Flight Center · NASA Goddard Space Flight Center · University of Hawai'i Maui College · National Grape Research Alliance · USGS science for a changing world · Agriculture Counts · Harvest · NASA Carbon Monitoring System · Garden City Community College · Thunder Basin Grasslands Prairie Ecosystem Association · National Geographic · Field to Market · Maryland Department of Agriculture · JPL Jet Propulsion Laboratory · DEVELOP · Farm Journal · The Nature Conservancy · Northwestern Oklahoma State University · United Way Maui United Way · OpenET · CEOS Committee on Earth Observation Satellites · Harvard · Habiterre · planet. · Pheasants Forever · Quail Forever · GEOGLAM Global Agricultural Monitoring · Bayer · indigo · WYVERN · pixxel · Corteva agriscience · AG DATA Transparent · Perennial · SATELLOGIC · MAXAR Technologies · syngenta · John Deere · Solutions from the Land · Microsoft · IBM Research · esri · efficient vineyard · ESMC Ecosystem Services Market Consortium

We surveyed >1000 U.S. Farmers about farm data and satellite data…

52% - "Satellite data would be valuable to my farm"

70% - open to or enthusiastic about working with NASA

70% - had little to no awareness of NASA's work in agriculture

(only) **27%** - view the benefits of sharing their ag data as worth the risk

(only) **28%** - know how to use satellite data (workforce development)

We haven't understood the needs of farmers – and not just the satellite data needs.

2024 Survey of U.S. Farmers (NASA Acres via Farm Journal / Trust in Food)

Acres

What can satellites *(help)* tell us about agriculture?

A lot.

***E**ssential*
***A**griculture*
***V**ariables*

Measurable "building blocks" to understand state and change in agriculture

- **What nature is doing**
  - All things weather and "immutable" land characteristics
  - Disease/pest detection
- **What humans are doing**
  - Cropland and crop type
  - Crop area
  - Crop, field, ranch management
- **What resulted**
  - Canopy nitrogen content
  - Crop yield estimate
  - Emissions, soil carbon
  - Water use efficiency
  - Management impacts
  - Extreme weather impact
- **What we can expect in the future**
  - Pest & disease risk
  - Within-season yield forecast
  - Long-term responses to weather impacts
- **What to do about it**
  - Manage nutrients and other inputs
  - Select management activities based on outcomes prioritized by farmers
  - Manage and reduce risk

And more.

Acres

nature sustainability

Article | Published: 28 July 2025

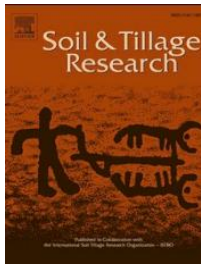
The mixed effects of recent cover crop adoption on US cropland productivity

David B. Lobell, Stefania Di Tommaso, Qu Zhou, Yuchi Ma, James Specht & Kaiyu Guan

International Journal of Applied Earth Observation and Geoinformation

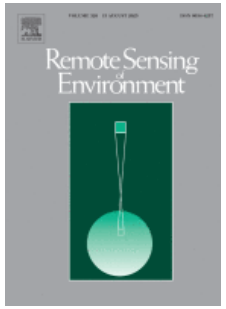
A tale of two datasets: using survey data and optical data to characterize long-term tillage intensity dynamics in Kansas

Guanyuan Shuai [a], Ritvik Sahajpal [a], Alyssa Kathleen Whitcraft [a], DeAnn Presley [b], Ron Graber [b], Rick Schlender [b], Dustin Fross [b]



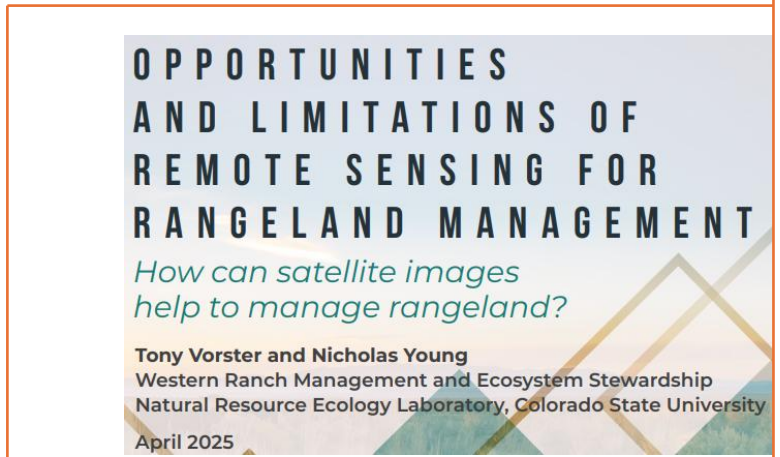
Multiyear crop residue cover mapping using narrow-band vs. broad-band shortwave infrared satellite imagery

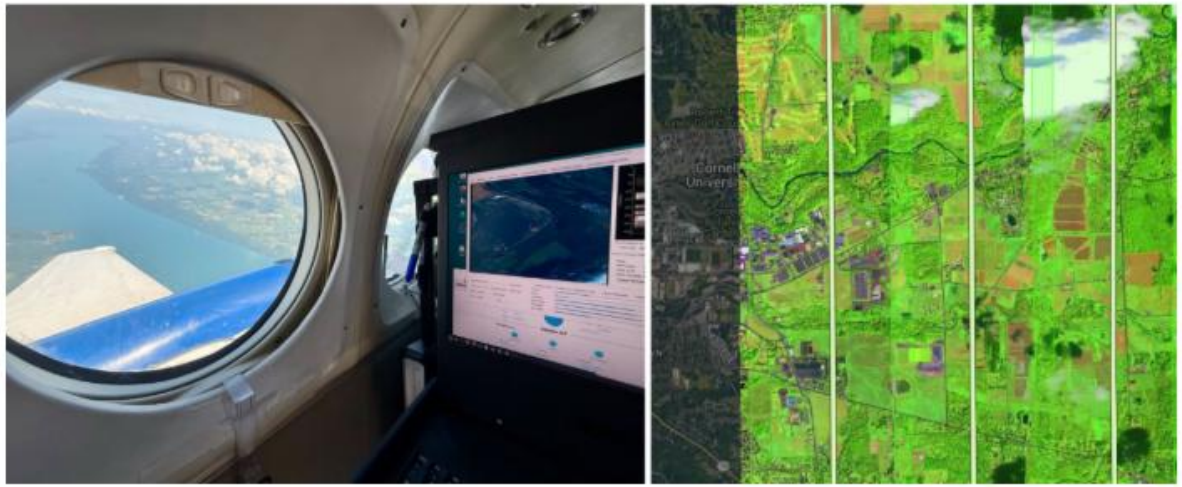
Brian T. Lamb [a], W. Dean Hively [b], Jyoti Jennewein [c], Alison Thieme [c], Alexander M. Soroka [d], Leticia Santos [e], Daniela Jones [e f], Steven Mirsky [g]



The impact of map accuracy on area estimation with remotely sensed data within the stratified random sampling design

Sergii Skakun





Left image: The Finger Lakes region as seen by AVIRIS-3. Photo by Dr. Holly Bender, NASA Joint Propulsion Laboratory. Right image: Ithaca Research Farm, Ithaca, NY, viewable at the AVIRIS4ACRES Data Portal, and more information at the Cornell University Agricultural Experiment Station website.

#AVIRIS4ACRES: NASA Acres-funded Research Takes Flight Over NY Farms

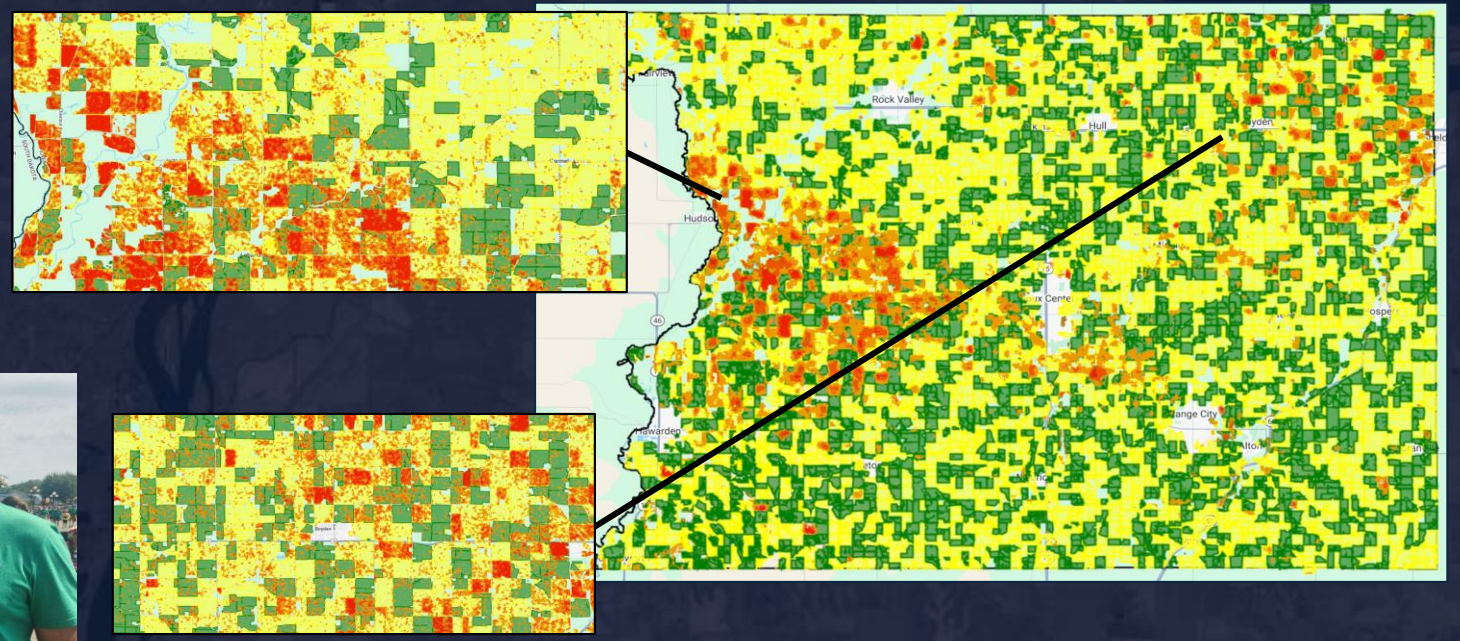
Thousands of acres spanning Cornell's research facilities and commercial vineyards in the Finger Lakes and Lake Erie regions were photographed this summer using hyperspectral imaging from NASA aircraft carrying AVIRIS-3 sensors. This cutting-edge technology captures crop stress signatures that could revolutionize early disease detection in specialty crops, potentially saving growers millions in losses before problems become visible to the naked eye.

Rapid Application of EAVs

A rapid analysis of an agricultural emergency made possible by relationships, trust, and existing NASA data & NASA Acres science

Today, Governor Kim Reynolds issued a disaster proclamation for Hancock, O'Brien, Osceola and Sioux Counties in response to severe weather that occurred on July 28, 2025. Gov. Reynolds' proclamation allows state resources to be utilized to respond to and recover from the effects of this severe weather and activates the Iowa Individual Assistance Grant Program and the Disaster Case Advocacy Program for those counties.
Read More

Lance Lillibridge with Gov. Reynolds



Jul 28

Derecho Hits 4 Counties in Iowa

NASA Acres Exec Director Alyssa Whitcraft calls IA Farmer and FIAT Co-Chair Lance Lillibridge to check-in

Jul 29

Gov. Reynolds Declares a State of Emergency in 4 Counties

Lance texts Gov. Reynolds, who connects him with her staff to suggest NASA Acres could pilot a rapid response analysis –
Gov. Reynolds connects Lance to DHS-IA

Jul 30-31

NASA Acres Begins the Rapid Analysis

DHS-IA, Lance, and Alyssa agree on priorities and possibilities for this rapid analysis –
NASA Acres partners at UMD and Arizona State immediately begin.

Aug 15-29

Analysis Shared and Reviewed with DHS-IA

NASA Acres walked IA DHS Director Benson through the analysis, and he has carried it onward

Positive feedback on this "proof of concept" showed the demand for NASA science in unofficial analyses.

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What can't satellites tell us about agriculture?

What do farmers want to know?

What drives their decisions?

Do they use satellite data to make decisions? Why, or why not?

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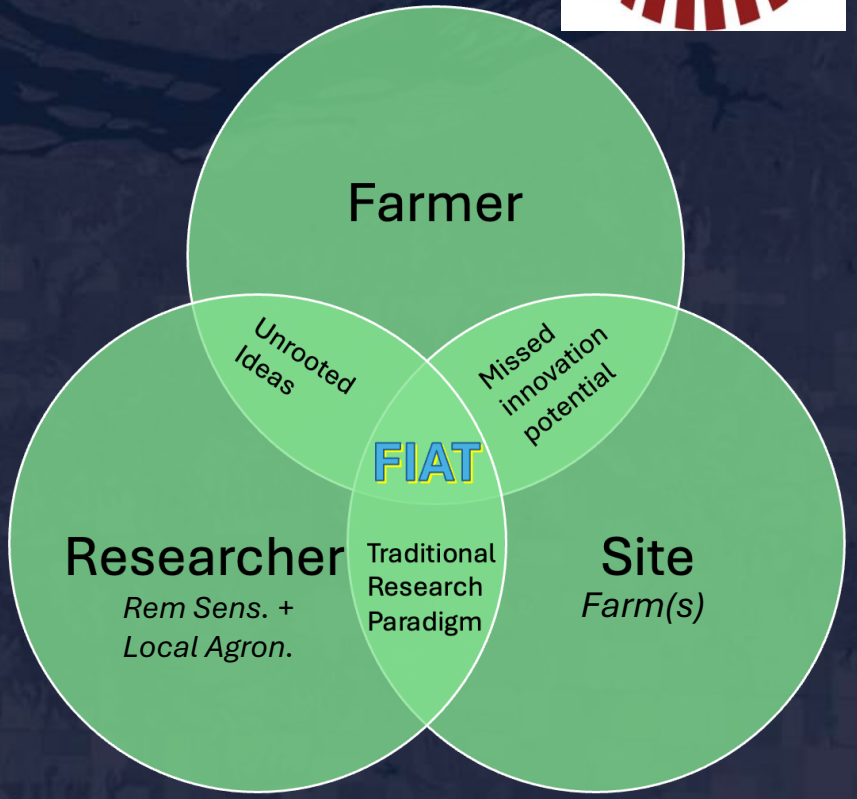
NASA Acres Farm Innovation Ambassador Team (FIAT)

est. 2025

FIAT is a new, co-developed partnership program

<u>FIAT farmers envisioned activities:</u>

- Co-design and actively participate in research and other FIAT activities on their farms
- Define focus topics and priorities for NASA Acres' work
- Provide ongoing feedback to refine our methods, products, and tools to maximize their utility on farm
- Serve as ambassadors to bring their community and their needs to NASA, and to bring NASA's data and tools to them



Inaugural NASA Acres FIAT Meeting (March 2025)

FIAT Formation Committee Members from AL, AR, CA, IA, IL, LA, MA, MD, NM, OK, and TX co-designed the inaugural FIAT Program Charter.

Elements of the Trust Infrastructure

Boots on the Ground

Space4Ag Listening Tours

4H, Future Farmers of America

Commodity Classic

Acres

Elements of the Trust Infrastructure

- Boots on the Ground
- **Data Governance**
  - (only) **27%** - view the benefits of sharing their ag data as worth the risk

Word Cloud of the "biggest concerns" from 2024 Survey of U.S. Farmers (NASA Acres via Farm Journal / Trust in Food)

In 2024, we launched our "Core Principles for Agriculture Data Use" to meet farmers where they are.

"The Ag Data Transparent board of directors*... applauds NASA Acres for... developing these principles to assist researchers and users of satellite imagery with proper data governance."

Ag Data Transparent
Transparency. Simplicity. Trust

AG DATA TRANSPARENT
AgDataTransparent.com

July 8, 2024

Alyssa Whitcraft, Ph.D.
Executive Director
NASA Acres

Re: Letter of Support for the NASA Acres Core Principles for Agricultural Data Use

Dear Dr. Whitcraft:

The Ag Data Transparent board of directors recently met and reviewed the NASA Acres Core Principles for Agricultural Data Use (2024) ("NASA Acres Principles"). The board applauds NASA Acres for investing the time and energy into developing these principles to assist researchers and users of satellite imagery with proper data governance. The NASA Acres Principles follow the same format as the ADT's Core Principles, which have served as guideposts for the agricultural industry for the last ten years. Overall, the ADT board expressed support for the NASA Acres Principles and we look forward to seeing how they are put into practice in the years ahead.

The ADT board thanks NASA Acres for taking data governance seriously and working to ensure the rights of farmers are protected when it comes to their agricultural data.

Sincerely,

Emily Buckman, President
Ag Data Transparent

***ADT Board of Directors:**
American Farm Bureau Federation, Nat'l Farmers Union, American Soybean Association, Nat'l Potato Council, Nat'l Sorghum Producers,, Nat'l Assoc of Wheat Growers, Nat'l Corn Growers Assoc, John Deere, Indigo Ag, Combyne...

Ag Data Transparent, 8425 Keystone Crossing, Ste. 111, Indianapolis, IN 46240

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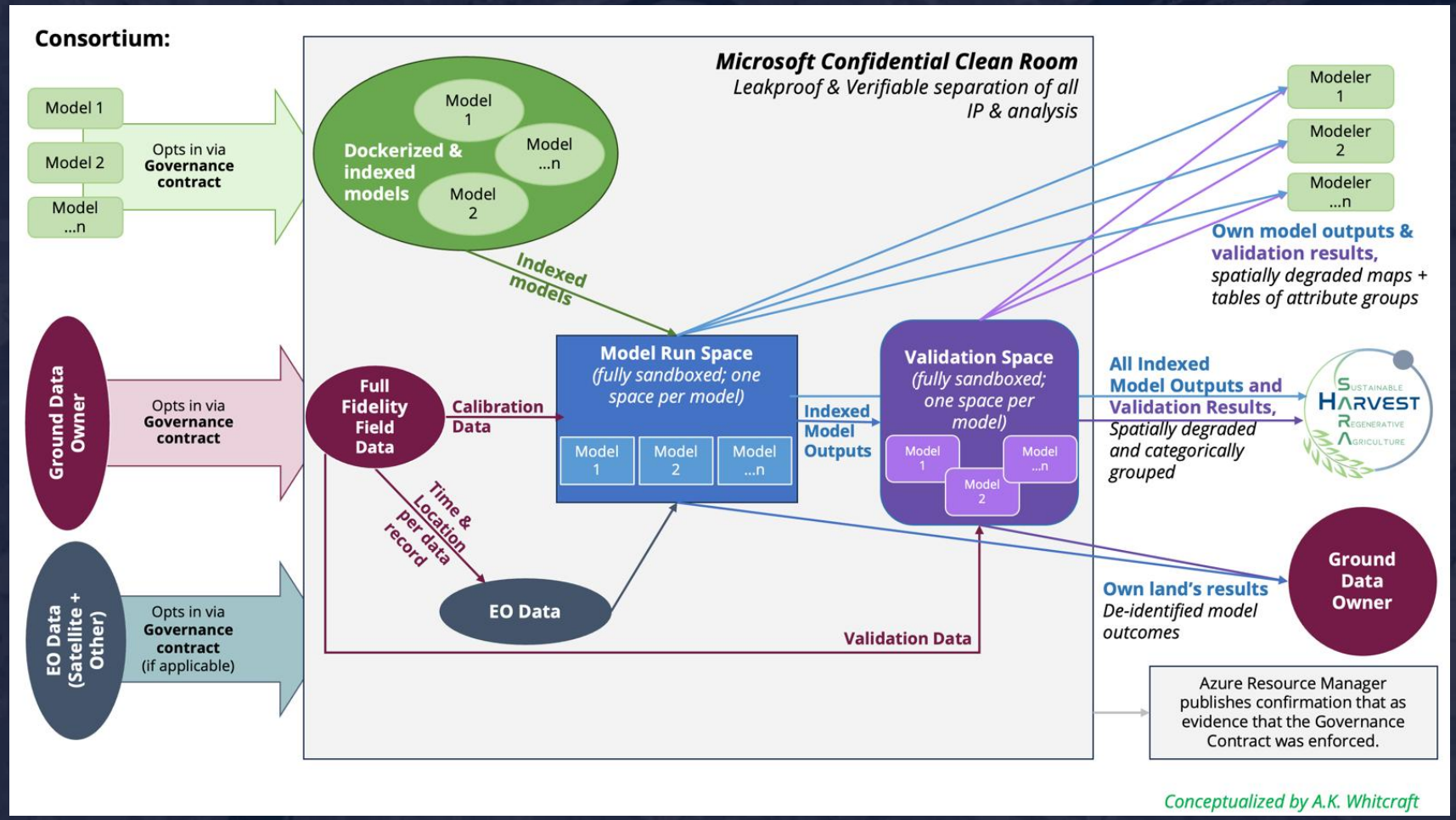
Elements of the Trust Infrastructure

- Boots on the Ground
- Data Governance
- **Secure Computational Systems**



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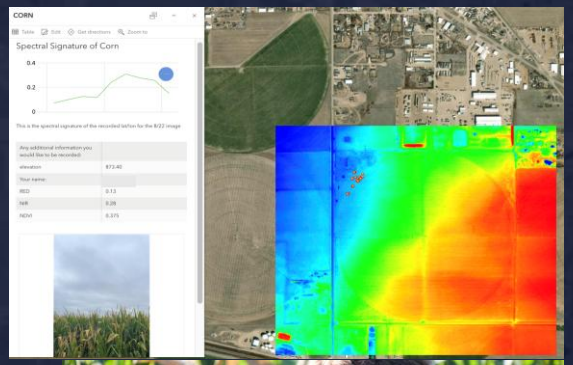
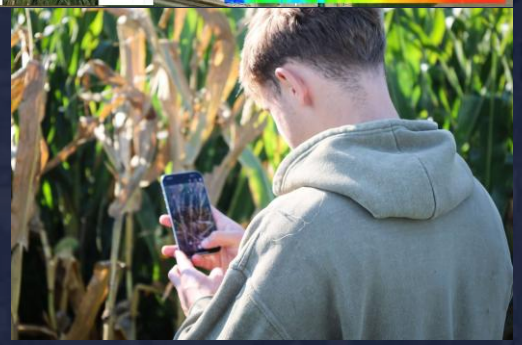
NASA Acres Workforce Development: *2025 Example Activities*

Equipping the next generation with competitive technical skills to benefit US Agriculture

Garden City Community College Course

"Technology in Agriculture" in Kansas





NASA Acres, Garden City Community College, Kansas State, and the University of Maryland partnered on a 15-week course geared at using NASA data and tools in real-on farm decisions. Students gained hands-on experience in collecting field data *(right)* and transforming field and satellite data into actionable insights *(top right)*.

Testimonials:

"Great for the community!"

"Helped add skill sets to students' resumes!"

"Great combo of agronomy-related tech and satellite info"

NASA Programs Put Interns to Work on Real Challenges

User-Driven Feasibility Studies in California, Maryland, & Texas

NASA Acres supported three **NASA DEVELOP** projects in Fall 2025. These projects are rapid feasibility studies for real-world partners. The projects were:

1. Southern High Plains Texas Agriculture Project
2. Lodi, California Agriculture Project
3. Maryland Agriculture Project

Maryland Agriculture Project participants with their supervisors, the Maryland Secretary of Agriculture, and Maryland Department of Agriculture staff after presenting their project findings.

What's Next?

- Science!
- Building the FIAT
- Building out workforce development efforts
- Building relationships with private sector
  - *Integrating multiple sources of data is critical*
- Making ***knowledge*** free and open

Thank you

Special thanks to:

- Other FIAT farmers not pictured
- All of NASA Earth Science
- Supporting organizations

Contact:
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allison@nasaacres.org

Acres
www.nasaacres.org
X @acresprogram