in the news

NASA at Your Table: The Space Agency's Surprising Role in Agriculture

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EDITOR'S NOTE: This article is taken from *nasa.gov*. While this material contains essentially the same content as the original release, it has been rearranged and wordsmithed for the context of *The Earth Observer*.

Everybody needs to eat.

Food is a basic necessity and is at the heart of every human culture and our sense of home. It also represents one of our most important connections to Earth. Crops and animal products, whether gathered from the ocean or the land, raised on farms big or small, across vast fields or in our backyards and urban communities, draw on sunlight, water, and soil to grow and thrive.

Producing food has always been challenging, and in the twenty-first century, human-caused climate change is already affecting food security through increasing temperatures, the frequency of extreme events, and changing precipitation patterns. This is increasing the risk of food supply disruptions by shifting growing and pastoral zones, reducing water access and food yield—all of which contribute to the changing landscape of our food and water supply.

In addition, more than 800 million people suffer from chronic hunger worldwide. By 2050, the global population is estimated to grow to 10 billion people. As the population—and the demand for food—continues to expand, we need innovative ways to feed the world.

That's where NASA Earth science data come in.

In the satellite era, Earth-observing data have increasingly become part of the food farming process. With observations from space and aircraft, combined with high-end computer modeling, NASA scientists work with partner agencies, organizations, farmers, ranchers, fishermen, and decision makers to share our understanding of the relationship between the global Earth system and the local environments that provide us food.

Working with local communities and decision makers to determine their needs and how they can best use Earth-observation data, NASA supports those who address issues like water management for irrigation, crop-type identification and land use, coastal and lake water quality monitoring, drought preparedness, and famine early warnings.

See the **Table** for a listing of stories NASA shared of people in the U.S. and abroad on how they use NASA data, such as:

- How they apply NASA science to help plan for and make it through growing seasons in the face of drought and water shortages;
- how Earth science data helps them develop more sustainable farming and aquaculture practices; and
- how partner organizations, such as the U.S. Department of Agriculture, use NASA data to achieve their goals in maintaining and monitoring crops and commodities worldwide.

These stories delve into the science that makes all this possible, showcase current and future satellite missions that collect this essential data, and look forward to the launch of the ninth Landsat mission, a joint mission with the U.S. Geological Survey.[1] The Landsat program has an unparalleled record of nearly 50 years of continuous Earth observations and is one of the essential satellite programs delivering data for agriculture.

[1] **UPDATE:** Landsat 9 successfully launched on September 27, 2021. See the Editorial in this issue for more information.

Table. Links to NASA stories that were released in summer 2021 to demonstrate the many ways NASA science has an impact on the food that reaches your table.

Title	URL
From Seed to Market	*go.nasa.gov/3f3H9Br*
How NASA Brings Food to the Table	*go.nasa.gov/2YVNRo2*
Snacktime with NASA: Chips and Dip (video)	*go.nasa.gov/3hxxILU*
Shoring up the Corn Belt's Soil Health with NASA Data	*go.nasa.gov/3lrNHfs*
Evapotranspiration: Watching Over Water Use	*go.nasa.gov/3lmQSFw*
How Satellite Maps Help Prevent Another 'Great Grain Robbery'	*go.nasa.gov/3CeRF1M*
NASA Watches Water to Help Grow Our Groceries	*go.nasa.gov/3lnayc7*
Snacktime with NASA: Space Salad (video)	*go.nasa.gov/2XgJKm5*
NASA Satellites Help Plan Future for Palau Fish Stocks	*go.nasa.gov/3EjptwQ*
An Upended Ecosystem in the Arabian Sea	*go.nasa.gov/3nvJJoO*
Snacktime with NASA: Ceviche (video)	*go.nasa.gov/3EfgWej*
Feeding the Sea (video)	*go.nasa.gov/3C2XXSi*
Drought Makes its Home on the Range	*go.nasa.gov/3hxfmdZ*
Sizing Up How Agriculture Connects to Deforestation	*go.nasa.gov/3nxXvaO*
Where Food Meets Methane	*go.nasa.gov/3lrq7zt*
Snacktime with NASA: Cheese Board (video)	*go.nasa.gov/3hzAKz8*

Landsat 9, together with other NASA Earth science missions, partner agencies, and the next-generation missions of NASA's Earth System Observatory, will provide a backbone of crucial Earth science information over the next decade. These missions will gather information on Earth's systems from above our heads, to under our feet; the atmosphere, water, land surface, soil moisture, and groundwater beneath Earth's surface. These data and the research that will improve our understanding of how these different parts of the environment interact and work as a system, will help communities and decision makers at all levels strengthen climate resilience and adaptation of the farming systems across all dimensions of food security—availability, access, stability, and utilization. ■

Open-Source Science: The NASA Earth Science Perspective

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Conclusion

Open-source science is the foundation of SMD and ESDS efforts to expand the use of NASA Earth science data to a more diverse, inclusive base of users. This evolving paradigm represents not only a new way of doing science, but a new way of thinking about what science means in terms of who can participate in the scientific process. Providing mission data, code, and supporting documents fully and openly—and as early in the scientific process as possible—broadens potential participation, enables collaborative work with big data collections, and enhances the opportunities for discoveries made using these data. As a result of these new approaches and requirements, open-source science is leading to more equitable science.

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