Improving Agricultural Compliance with Planet

Civil Government

AGRICULTURE
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CONTENTS

FORT DODGE • Iowa, USA • May 20, 2023

CHAPTER ONE

The Challenge of Agricultural Oversight

Governments play a critical role in stabilizing farm income, ensuring food security, and minimizing the environmental impact of agricultural operations. A significant portion of government support to the agricultural sector comes in the form of direct payments. In fact, between 2021 and 2023, Organisation for Economic Co-operation and Development (OECD) member countries collectively provided an average of $629 billion annually in financial support to individual agricultural producers.[1]

Yet, despite these massive outflows, many governments are unable to monitor parcel-level changes throughout the growing season. Public satellite missions may lack the spatial and temporal resolution required to detect changes on small farms and in cloudy areas. Meanwhile, manual site visits and aerial imagery are unable to track detailed changes over time. Gaps from existing datasets can delay the administration of government-backed programs farmers rely on to remain profitable, like subsidies, crop insurance programs, and preferential financing terms.

Limited visibility into individual farm practices creates additional challenges for governments. It can delay the detection of early pest outbreaks, leading to economic losses for producers and expensive remediation programs. It can also make it difficult to identify sources of nitrogen and phosphorous runoff, negatively impacting waterways and downstream recreation areas. And it can lower compliance with water-use restrictions, leading to inefficient allocation of critical water resources during times of drought.

This raises a crucial question: Without comprehensive data, how can you truly know if your agricultural policies and programs are working as intended?

Caracal, Romania • May 7, 2023

[1] OECD (2024), Agricultural Policy Monitoring and Evaluation 2024: Innovation for Sustainable Productivity Growth, OECD Publishing, Paris. https://doi.org/10.1787/74da57ed-en.

CHAPTER ONE

The Challenge of Agricultural Oversight

To ensure agricultural policies and programs achieve their desired impact, governments need timely and detailed parcel-level data with tools to rapidly generate reliable insights. This is where Planet comes in. Powered by the largest commercial constellation of Earth observation satellites in orbit and a cloud-based platform to streamline analysis, Planet delivers regular visibility into farms of all sizes across your territory, including small fields and cloudy regions that are often difficult to monitor with public satellite imagery. Governments work with Planet to accelerate administrative workflows, improve analysis and reporting capabilities, and help ensure agricultural policy reforms are fair and effective.

How Your Team Can Work With Planet

SOLUTIONS

Accelerate administrative workflows with Planet Area Monitoring

Use our out-of-the box agricultural compliance solution to monitor individual fields at any scale, quickly verify eligibility for subsidy and crop insurance payments and accelerate payments to beneficiaries.

Read more in Chapter Two ↘

PLATFORM

Centralize your Earth data and improve your analysis capabilities with Planet Insights Platform

Our flexible, cloud-based APIs and tools enable governments to bring Earth data into existing workflows, process large datasets at scale and empower non-technical users to generate reliable and actionable field-level insights.

Read more in Chapter Three ↘

DATA

Expand visibility with national-scale foundation data layers for agriculture

Planet offers powerful data layers to enhance regular monitoring, including near-daily 3.7 meter resolution PlanetScope® data, analysis-ready data, 20 m soil water content and land surface temperature Planetary Variables®, automated field boundary estimation and analytics feeds.

Read more in Chapter Four ↘

CHAPTER ONE

The Challenge of Agricultural Oversight

Planet Enables Broad Area Management

Planet data complements and enhances public satellite systems by providing visibility into small or irregularly shaped plots, additional cloud-free data, and the ability to detect subtle changes and specific events that occur on farms. Adding Planet data to your toolkit unlocks the ability to monitor detailed changes at scale, an approach we call broad area management. Users across government can monitor vast areas, identify relevant changes with AI-powered alerts, and gain valuable context from ready-to-use analytics.

- **Go Broader:** Monitor changes on individual fields of any size across your region, including small parcels and in cloudy regions. See changes to crop health and site-specific practices like cover cropping, buffer strips, rotational grazing, and no-till.
- **Look Backward:** Fill data gaps using our archive of near-daily imagery dating back to 2017. Quantify changes in field activity and over any geographic boundary to track policy and program effectiveness.
- **Get Closer:** Improve confidence of remote sensing observations with near-daily 3.7 m imagery. High-resolution 0.5 m tasking provides a more detailed look on demand when you need it.
- **Delve Deeper:** Planetary Variables offer critical environmental and agricultural measurements, including 20 m soil water content and land surface temperature, 3 m crop biomass, and automated field boundary estimation.

Near-daily PlanetScope images (insets) show details of agricultural land use while a monthly basemap (background) provides an almost cloud free look at the Netherlands.

CHAPTER ONE

How Your Team Can Work with Planet

Global Partner Network

Planet technology partners can help you achieve agency goals by building custom agricultural monitoring solutions tailored to your specific priorities and needs, including implementing last-mile solutions using satellite imagery.

Planet customers are using agricultural monitoring solutions for wide-ranging projects, including:

- Monitoring irrigation water usage and nitrogen runoff
- Reducing inflated and false self-reported claims for government payments
- Improving the efficiency and reliability of subsidy verification workflows

Whether your work in government is focused on administering payments to farmers, studying long-term effects of agricultural practices, or adapting policies for future needs, we understand that communities are depending on you to make the best possible decisions. Planet data can help support you in this work.

Tucuruí, Brazil • August 30, 2024

CHAPTER TWO

Automating Routine Agricultural Compliance Workflows with Planet Area Monitoring

Governments rely on a combination of farmers' self-reported data and remote sensing technologies to verify eligibility for payments across vast areas. But for many farmers, the documentation required to prove eligibility can become a deterrent, leading to lower enrollment in income support and insurance programs. And governments often struggle to manage disjointed datasets from multiple sources, which slows down common administrative workflows. Where government oversight is limited, authorities may inadvertently pay for fraudulent or inflated claims.

To stabilize farm income, improve compliance, and effectively allocate limited resources, agriculture departments need an ongoing record of changes on parcels of all sizes throughout the year.

About Planet Area Monitoring

Planet Area Monitoring makes it easier for governments to verify eligibility for direct payments to agricultural producers, such as subsidies, crop insurance, and preferential financing and loans. Built on a cloud-native infrastructure with public and commercial Earth data sources, Planet Area Monitoring identifies specific changes on individual farms throughout the growing season.

Examples of what can be identified and monitored include:

- Dates of planting, mowing, plowing, and harvest events
- Evidence of exposed bare soil or intercropping practices
- Consistency between declared and observed land use

Authorities can use customized decision trees to identify parcels that meet specific program requirements and streamline compliance and approval processes. Customizable apps enable users to share data-driven insights directly with beneficiaries.

Benefits for the government:

- Process large datasets efficiently at scale
- Quickly verify eligibility for direct payments
- Save time and money on manual site visits
- Share data-driven insights directly with beneficiaries
- Enhance reporting capabilities

Evaluating crop type over a field of interest with Planet Area Monitoring.

SPOTLIGHT

Slovenian National Paying Agency

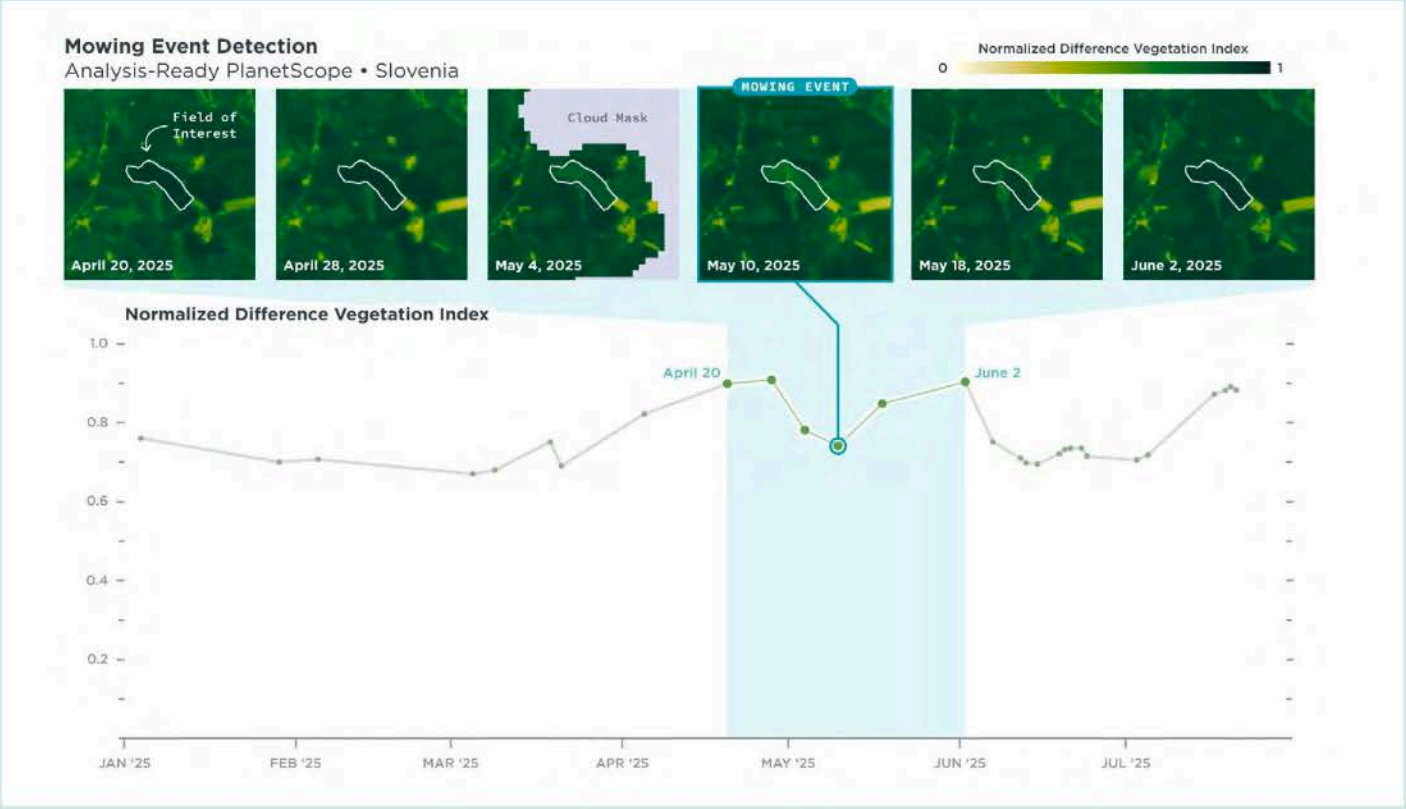
In recent years the European Union (EU) has taken steps to digitalize its vast agricultural sector and improve the efficiency and accountability of area-based payments to farmers under the Common Agricultural Policy (CAP). Starting in 2024, the EU required each member state to maintain a fully operational satellite-based Area Monitoring System (AMS) to administer payments. However, recent reforms introduced new eligibility requirements which often require more detailed remote sensing data than Sentinel-2 alone could provide. The Slovenian National Paying Agency used Planet Area Monitoring to fulfill the regulatory requirement for an AMS and monitor agricultural activities nationwide. Previously, the agency used 10 m satellite imagery, which left a quarter of fields unmonitored. These gaps required costly, time-intensive manual checks. By integrating Planet data, the agency reduced inconclusive parcels by 73%, saving over €1 million annually on manual processes and field visits. The improved resolution increased parcel monitoring and enhanced public confidence in the program, demonstrating a more effective and trusted approach to CAP compliance.

Read the case study ↘

RESULTS

Reduced inconclusive parcels by **73%**

Saved over **€1 million** annually on manual processes and field visits



Analysis-Ready PlanetScope data enables the detection of a mowing event in a field in Slovenia. The data are filtered to only show cloud-free days with full coverage of the field.

CHAPTER THREE

Improving Acricultural Policy Outcomes with Planet Insights Platform

Advances in sensor technology and computing power have created new opportunities to use satellite data to monitor dynamic changes throughout the growing season. However, it can be difficult to combine open Earth observation datasets with other program data to conduct policy and program analysis.

Data is often stored in different agency systems and can require highly technical expertise to manipulate and analyze. Fragmentation and incompatibility among different datasets makes it difficult to understand whether agricultural policies are leading to desired outcomes. It can also delay the response time when authorities face rapidly-changing events like pest outbreaks and flash droughts.

Planet Insights Platform brings governments powerful AI-driven tools to detect time-sensitive changes on any field and generate reliable, actionable, and scalable insights about individual parcels over broad areas. This cloud-native platform integrates proprietary datasets with public missions in one place, making it easy to quickly query, process, visualize, and analyze high volumes of Earth data and generate relevant statistics. Robust integrations make it possible to access and manipulate this data directly within existing systems such as ArcGIS or QGIS. With Planet Insights Platform, you can share up-to-date, reliable information about changes to agricultural parcels at any scale.

The ability to rapidly analyze geospatial data enables governments to optimize personnel and allocate budget to the highest need. Instead of asking what is happening on a subset of fields, you can focus on the highest-priority locations and be confident that your time and resources will have the biggest impact.

Benefits for Program Managers

- Monitor near-daily changes to land use and key environmental data
- Vastly improve knowledge of site-specific farm practices without GPS data
- Expand access to satellite data to more users in your agency
- Reduce costs and complexities of cloud storage and large data downloads

Benefits for GIS Managers

- Centralize proprietary and public agricultural and land use data
- Conduct efficient, large-scale geospatial analysis and make remote sensing insights accessible to non-experts
- Seamlessly integrate with other apps and leading GIS software
- Professional services, partners, and support facilitate seamless integration and onboarding

SPOTLIGHT

UK Rural Payments Agency

The UK Rural Payments Agency (RPA) leveraged Planet data to transform its ability to verify compliance with sustainable farming practices on a national scale. Prior to using Planet data, RPA faced challenges managing vast datasets and ensuring consistent verification processes at a national level.

With Planet Insights Platform, the agency reduced the time needed to preprocess satellite data from nine months to just two weeks and enabled near-instant data access and analysis, dramatically improving operational efficiency.

User adoption expanded from 1-2 GIS experts to 15 non-specialists, while streamlined workflows allowed compliance checks to cover 100% of agricultural areas, compared to just 2% previously.

Read the case study ↘

"Planet Insights Platform made it easy for us to access the data, batch process, create and apply models at a national scale and pace."

YAJNASENI PALCHOUDHURI, Ph.D
Earth Observation Specialist
UK Rural Payments Agency

Ruabon, Wrexham County Borough, Wales, UK • June 17, 2022

RESULTS

User adoption expanded from 1-2 GIS experts to **15 non-specialists**

Compliance checks covered **100% of agricultural areas**

SPOTLIGHT

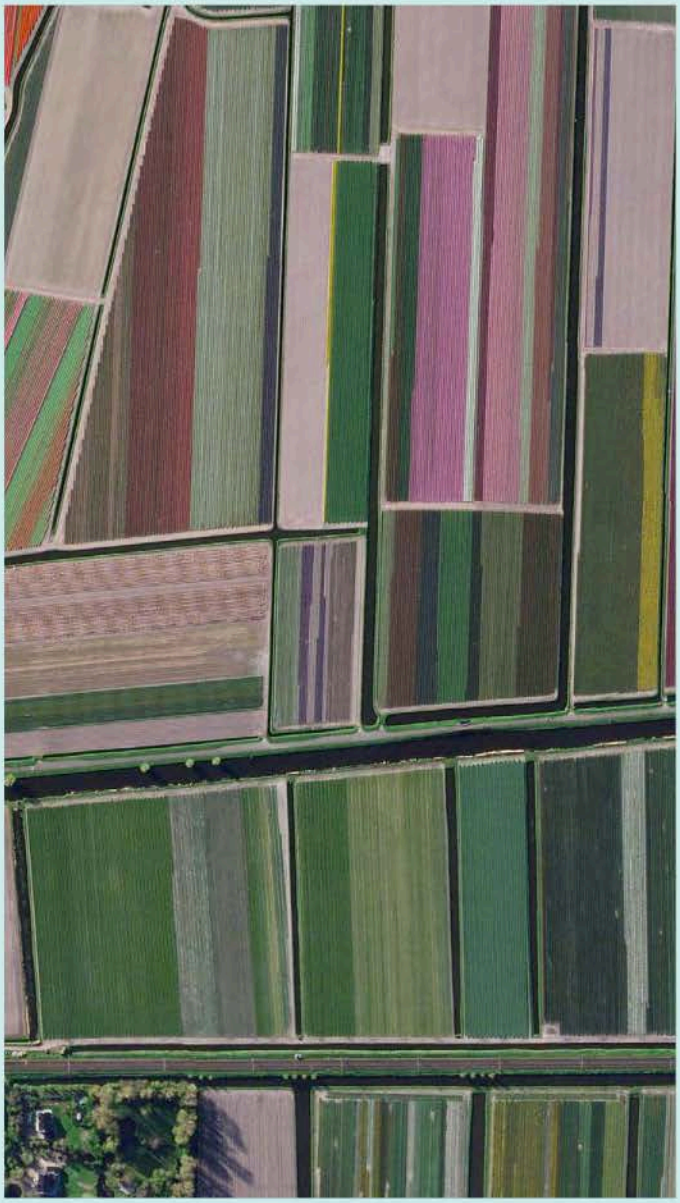
Netherlands Geomatics & Earth Observation B.V. (NEO) and Dutch Paying Agency

Netherlands Geomatics & Earth Observation B.V. (NEO), a Planet partner, used Planet Insights Platform to build a custom agricultural compliance solution for the Dutch Paying Agency. In the past, the agency relied on 10m Sentinel-2 data, which lacked the spatial and temporal resolution needed to monitor smaller fields and narrow parcels. Data gaps left many farms unmonitored and required costly manual site visits.

By utilizing Planet's spatially aggregated time series, NEO delivered a custom solution which helped the Dutch Paying Agency increase the number of monitored parcels from 650,000 to 1 million while reducing the number of manual visits.

Enhanced data coverage significantly reduced administrative burdens and helped the Dutch Paying Agency conduct more efficient and reliable subsidy verifications, saving time and resources while enabling more accurate reporting to the EU on subsidy spending.

Read the case study ↘



TULIP FIELDS • Hillegom, The Netherlands • April 10, 2024

RESULTS

Increased number of monitored parcels from **650,000** to **1 million**

CHAPTER FOUR

Expanding Visibility with National-Scale Foundation Data Layers

When it comes to environmental impact, every field matters. But governments don't always have visibility into all fields. Planet data complements and enhances public satellite systems by providing visibility into small or irregularly shaped plots, additional cloud-free data, and the ability to detect subtle changes and specific events. Our versatile satellite data layers help scientists conduct research and program managers improve compliance and oversight into agricultural operations in their region.

How You Can Use Planet Data Layers for Agricultural Monitoring

	**PLANET MONITORING** PlanetScope™ constellation	Monitor compliance Fill data gaps Detect stressors Improve models	See changes to crop health Assess the impact of conservation practices
	**PLANET TASKING** SkySat® constellation, Pelican constellation	Targeted monitoring	Site-specific high-resolution data on request
	**PLANETARY VARIABLES** Soil Water Content, Land SurfaceTemperature, Crop Biomass, Field Boundaries	Automatically identify and map field boundaries Track soil moisture and temperature conditions	Monitor crop growth, detect stressors, and estimate yields
	**ANALYSIS-READY DATA** Fusion, Analysis-Ready PlanetScope™ Basemaps	Detect specific events like harvesting and mowing on any field	Monitor long-term changes over an area of interest

Researchers have published hundreds of peer-reviewed studies using Planet data since 2009.

Search the publications database ↘

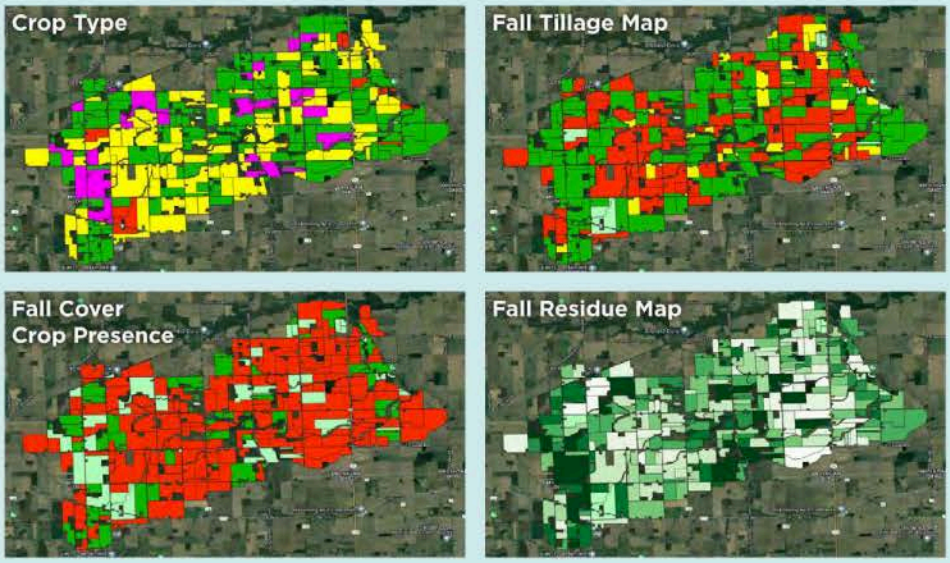
SPOTLIGHT

Agrograph

Excess nitrogen and phosphorus can leach into waterways and cause significant environmental damage, including harmful algal blooms and the loss of aquatic biodiversity. Many governments implement watershed management plans that reduce sedimentation as well as nitrogen and phosphorous runoff in surface waters. Public satellite data can be used to monitor best management practices such as cover cropping and riparian stream buffers. However, public data sources can be incomplete and difficult to analyze.

Agrograph, a software company based in Madison, Wisconsin (USA), uses Earth data from Planet to track best management practices and generate AI-powered insights into nitrogen runoff and yield assessment. In order to convert raw observations into insights for government customers, Agrograph needed frequent observations in the right bands and their own artificial intelligence algorithms.

Using Planet data as a key input, Agrograph builds custom crop type maps that enable authorities to determine which crops are growing, whether fields are tilled sustainably, whether cover crops were planted, and how much residue is left in the field after harvest.



Agrograph uses multiple datasets, including data from Planet, to monitor management practices and identify potential sources of runoff in agricultural regions. These analyses help agencies prioritize which fields to target for intervention.

Added visibility enables governments to flag specific fields that are likely sources of runoff and in need of intervention, like those that have been tilled with no cover crops planted. The vast Planet archive of near-daily data allows users to get a baseline by going back 10 years to monitor long-term trends and impacts.

Working with Planet and Agrograph gives governments site-specific field data on a vast scale, enabling more fields in the watershed to be monitored. Regular insights enable program managers to target resources to areas where they can have the biggest impact and talk directly with farmers about practices to improve nutrient management, reduce soil erosion, reduce runoff, and hold more water in the field.

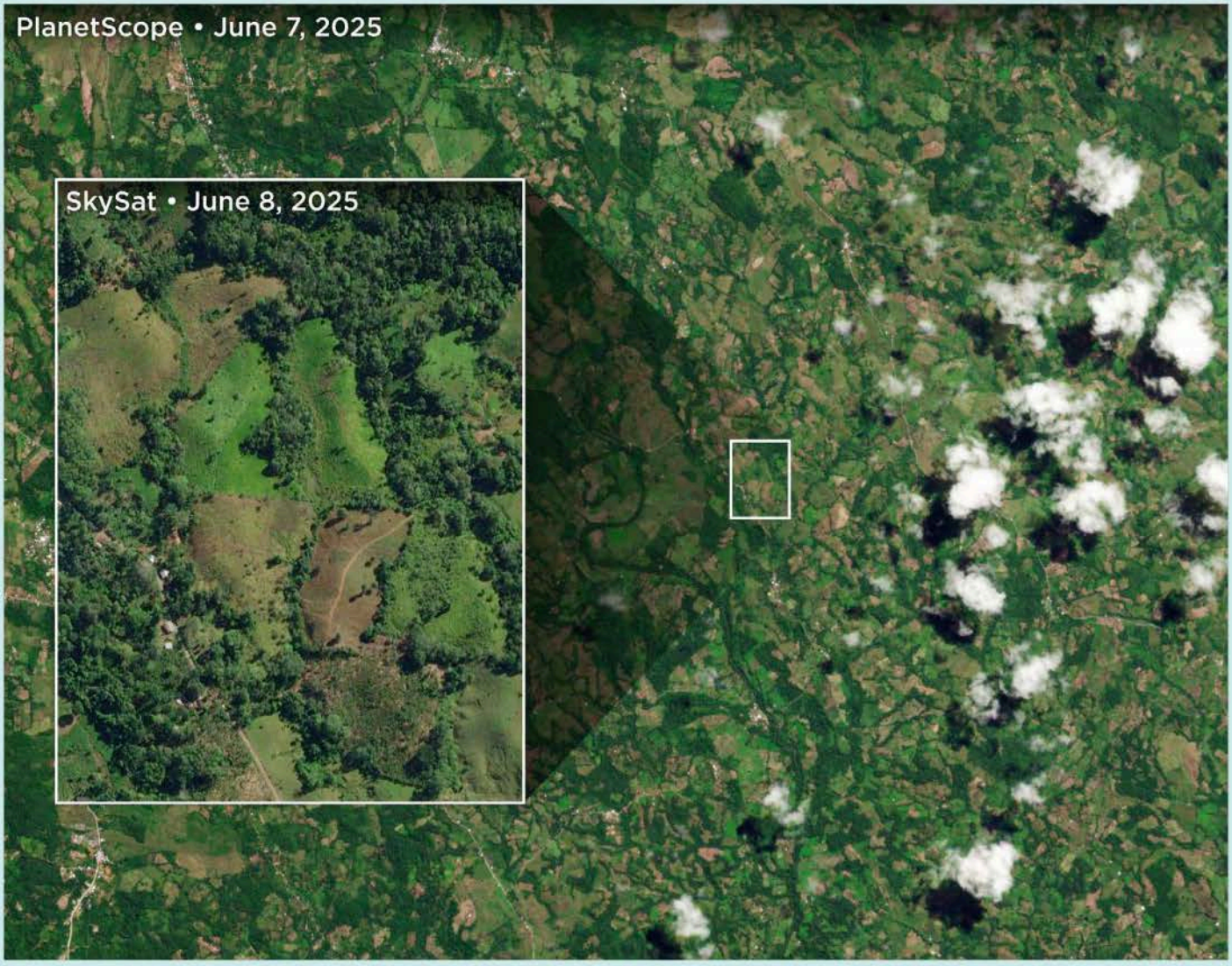
> "Using Agrograph and Planet allows program managers to target areas where change will have the most impact."
>
> TARALINDA WILLIS
> CEO, Agrograph

SPOTLIGHT

Antinarcotics Directorate of the Colombian National Police (DIRAN)

Since 2017, the Antinarcotics Directorate of the Colombian National Police (DIRAN) has relied on Planet satellite data to monitor and eradicate illicit crop growth and harvest in near-real time. To improve visibility into crop production, DIRAN leverages near-daily 3.7 m PlanetScope imagery along with Planet Basemaps, which offer seamless, cloud free mosaics of recent imagery across Colombia's agricultural lands. In order to look closer at specific fields, DIRAN uses SkySat tasking satellites which provide 50 cm high-resolution imagery of specific areas of interest.

Planet's high-resolution imagery and broad land coverage enable DIRAN to monitor changes in crops across the country and help identify when a field's plants are illicit. By embracing this digital technology over the years, DIRAN has made significant strides in gaining critical intelligence information on illegal activities and combating this cultivation.



High-resolution imagery provides a more detailed view in areas that may need additional inspection.

SPOTLIGHT

Odisha Space Applications Centre (ORSAC)

The Food Supplies and Consumer Welfare Department in Odisha, India, uses a minimum support price (MSP) system to procure paddy crops from more than 1.5 million farmers and improve food security among citizens in need. The system was designed to protect growers from excessive price falls during high-yield years. However, self-reporting by farmers during the registration process led to consistent misuse and wrongful allocation of public funds. Without a validation system in place, the department had no way of knowing whether farms were growing what they claimed. Satellite data and analysis offered policymakers a remarkably effective solution. Working with SPARC Private Limited, a leading geospatial technology company, ORSAC was able to use artificial intelligence (AI) and machine learning (ML) techniques to analyze satellite data across multiple crop seasons and compare it to information reported by millions of farmers.

In 2022, this system enabled policymakers to identify and confirm misreporting of approximately 865 thousand metric tons of paddy, amounting to INR 1,700 crores (USD 206 million) in net government savings. Introducing paddy crop validation also encouraged more small and medium farmers to contribute to (and benefit from) the MSP system. Their participation improved from 77% in 2020–21 to 87% in 2022–23 in the monsoon crop procurement. By building Planet data and advanced machine learning techniques into their workflows, ORSAC is able to support farmers and improve food security across Odisha.

Read the case study ↘

RICE PADDY • Attabira, India • May 23, 2023

CHAPTER FIVE

Bringing Planet to Your Agency

Government programs work best when they work together with shared, trusted information. To support your innovation, transparency, and efficiency goals, we offer a straightforward enterprise-wide license that grants unlimited access to the Planet platform.

Agencies typically choose this option to keep costs predictable and reduce administrative burden.

You can integrate Planet data into any workflow with our flexible integration options:

- **Extensive APIs:** Build custom integrations and data pipelines to power any Earth observation solution built in ArcGIS
- **Streaming Web Services:** Stream OGC web services directly from Planet into your own GIS applications
- **ArcGIS Pro Add-in:** Simply search, access, and analyze Planet's catalog of daily global imagery within ArcGIS Pro

The Planet team provides knowledgeable support throughout the procurement process. We offer consultation and demonstrations during discovery to help you explore Planet's offerings.

When you determine your needs, we will provide you with a proof of concept and workshop to help stakeholders build consensus. And after the contract is signed, our Professional Services team will help ensure your integrations work as intended and help drive end-user adoption in order to ensure you benefit from your investment without delay.

Contact Us

Learn how Planet Can help you turn data into actionable insights.

Get in Touch

Find a Partner

Reach out to our partner network to explore custom solutions.

Meet Our Partners