Resolving Inconclusive Parcels in Slovenia with Planet Fusion

A SLOVENIAN NATIONAL PAYING AGENCY CASE STUDY

Small farms in Odranci, Slovenia • April 9, 2021

BACKGROUND

A PIONEER IN AGRICULTURAL REFORM

In recent years, the EU has undertaken a modernization process for the CAP that aims to make it more simple, cost-effective, and sustainable. As part of the process, remote sensing technologies can be used when making checks for area-based CAP payments. As a result, on-the-spot-checks (OTSC) may be fully replaced by automated checks based on the analysis of Earth observation data. To date, **the CAP covers 174 million agriculture hectares**, with 5-10% of those hectares comprising smaller fields.

About Planet

Planet is a leading provider of global, daily satellite imagery and geospatial solutions. Planet is driven by a mission to image the world every day, and make change visible, accessible and actionable. Planet designs, builds, and operates the largest Earth observation fleet of imaging satellites, capturing and compiling data from over 3 million images per day.. To learn more visit **www.planet.com** and follow us on Twitter at **@planet.**

About The Common Agricultural Policy (CAP)

The CAP is a set of regulations, supported by subsidies paid to farmers, to ensure that EU policy goals such as food security, fair farmer income, sustainable farming, resource management, tackling climate change, maintaining rural areas and landscapes across the EU, and more, are met. The CAP is based on shared management, managed and funded on an EU level and implemented by Member States (MS) at the National level.

About ARSKTRP

The Slovenian National Paying Agency (**ARSKTRP**) is among the early implementers of a country-scale, wall-to-wall, Area Monitoring System (AMS) that is used to conclude on the eligibility of the CAP aid or support requested.

ARSKTRP manages all Slovenian CAP subsidy applications and performs various checks to verify the compliance with the eligibility criteria, commitments, and other obligations. In 2021, more than 56,000 Slovenian farmers received around €225M in agricultural subsidies for ensuring good agricultural practices. The holdings covered over 825,000 agricultural parcels representing just shy of a half a million hectares covering permanent grassland, arable land, and permanent crops.

CHALLENGE

THE CHALLENGE OF INCONCLUSIVE PARCELS

In preparation for the 2023 reform of the CAP, ARSKTRP, The Slovenian Paying Authority, was planning to develop a Checks by Monitoring (CbM) platform to replace On The Spot Checks (OTSC).

Since the announcement of the reform, the EU has relied on **Copernicus Sentinel satellites** and other earth observation data to check farmers' fulfillment of the requirements set forth by the CAP for area-based payments. The resolution and cadence of these missions, however, can pose limitations for efficient implementation of CbM, and ARSKTRP was in search of a data solution for smaller fields and other challenging parcels. Nearly a quarter of the parcels in Slovenia cannot be evaluated with Sentinel data because the fields are too narrow to produce reliable time-series data. Sentinel's resolution also proved insufficient for detecting farming activity on permanent grasslands and extensive orchards. Likewise, cloud cover often obscured the timely observation of some events like mowing. These factors combined make it impossible to monitor 100% of all declared parcels using only Sentinel data, presenting a potential administrative burden for ARSKTRP, considering the manual follow ups required.

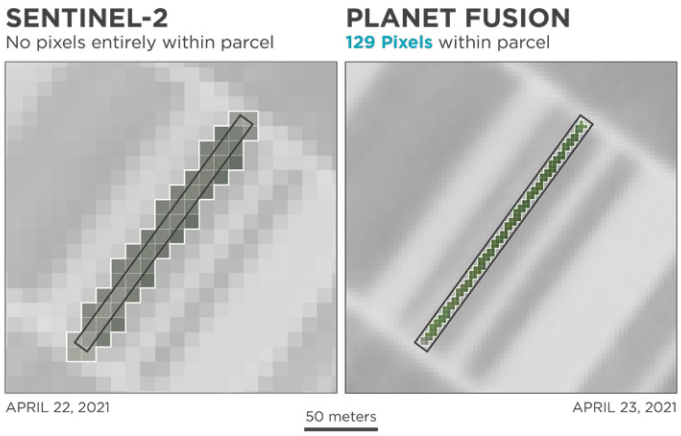
Using commercial satellite data offers a cost-effective means of assessing agricultural activities, with value far outweighing the cost.

SOLUTION

A PROMISE OF VALUE: PLANET FUSION

ARSKTRP and their service provider **Sinergise** started working together in August 2020 to develop an advanced operational solution for the AMS, preparing satellite data for analysis and developing a machine-learning-powered system to validate results and communicate with farmers. They quickly identified the limitations of Sentinel imagery and started to explore the use of Planet data within a small pilot.

In 2021, ARSKTRP and Sinergise decided to incorporate Planet Fusion data into the solution to address the challenge of elongated parcels and other cases resulting in inconclusive results with Sentinel data. Planet Fusion is a high-resolution complement to Sentinel-2 with a spatial resolution of 3m per pixel, granular enough to enable CbM of small parcels. Planet Fusion data is harmonized to Sentinel-2, meaning that ARSKTRP and Sinergise are able to apply the developed CbM process without any additional modifications.



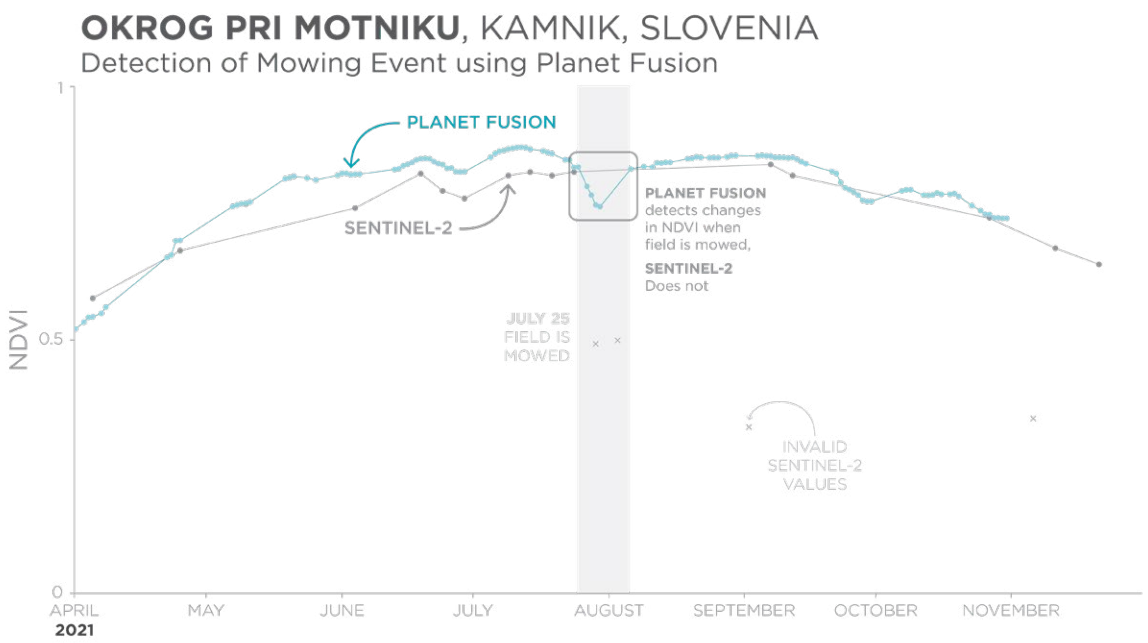
Planet Fusion Monitoring supplies data with a 3m pixel size, allowing relevant observations within narrow parcels that can be challenging to assess with data from Sentinel-2.

> "With the complexity and small size of the average agriculture in Slovenia, where almost a quarter of the parcels don't fit Sentinel constraints, the whole program would be under risk due to too many inconclusive parcels, were there not for this additional source - Planet Fusion."
>
> **LEA REMIC**
>
> Head of the Department for Geo-spatial Applications.

AN INTRODUCTION TO FUSION

Planet Fusion is Planet's next-generation analysis-ready data product, delivering a consistent, daily stream of highly-accurate radiometric data. Planet Fusion harmonizes PlanetScope observations with data from multiple public constellations to provide more complete time-series datasets that are free of gaps and clouds.

Planet Fusion's cleaner, more complete data drives higher accuracy for analysis and modeling, machine learning applications, and Sinergise's tools for AMS. Planet Fusion supplies data that is dependable and analysis-ready, greatly reducing the burden of image processing workflows.



Planet Fusion's daily observations make it easier to detect changes in the vegetative health of fields. Here, a drop in Normalized Difference Vegetative Index over a field near Kamnik, Slovenia signals that a field has been mowed. Sentinel-2 observations would not have provided enough coverage to detect the mowing event.

PLANET FUSION FOR AUTOMATED CHECKS BY MONITORING

As a first step in performing eligibility checks, ARSKTRP processes the signals for all declared agriculture parcels. Polygons are carefully analysed against the Sentinel mission distribution grid to evaluate if sufficient signals can be retrieved. If Sentinel data is insufficient, the same process is run with Planet Fusion data. These signals then enter the ML-based models to calculate the markers — identification of mowing and harvest events, homogeneity, crop and land cover type as well as overall similarity to the neighboring parcels of the same type. The same models can be used for both Sentinel-2 and Planet Fusion, making the development process simpler and more transparent.

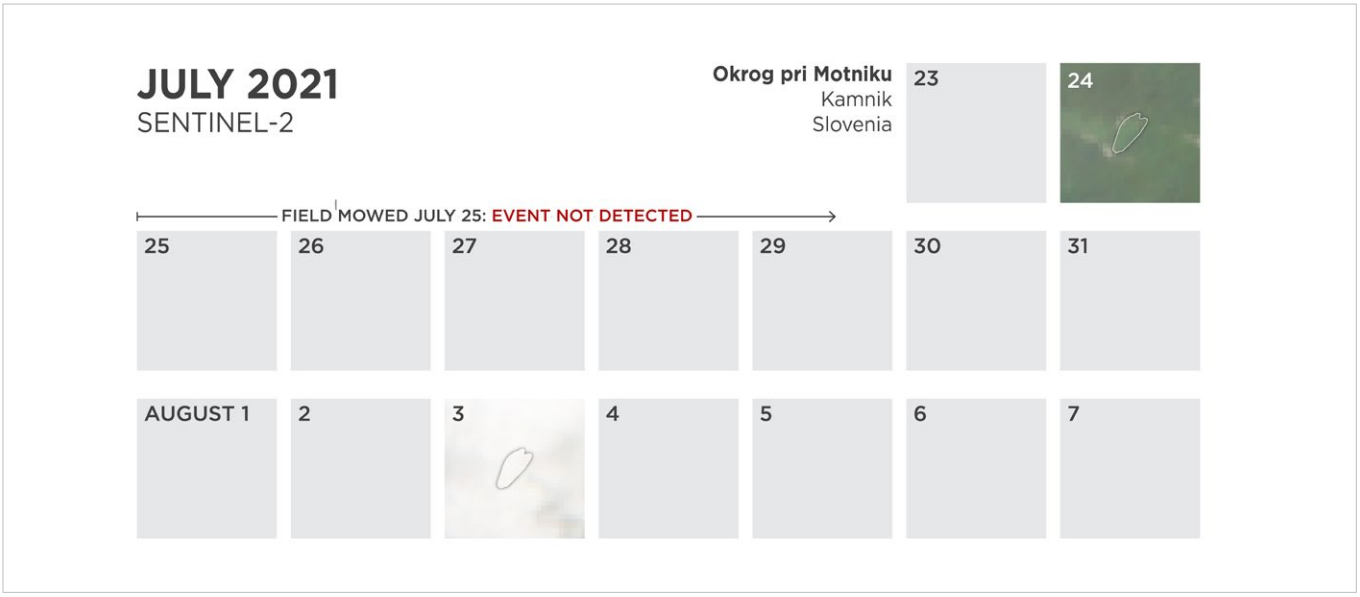
Since the adoption of Planet Fusion, ARSKTRP has reduced the number of inclusive parcels from 246,000 to 66,000, a decrease of 73%, reducing the cost of follow-up activities by more than €1M.

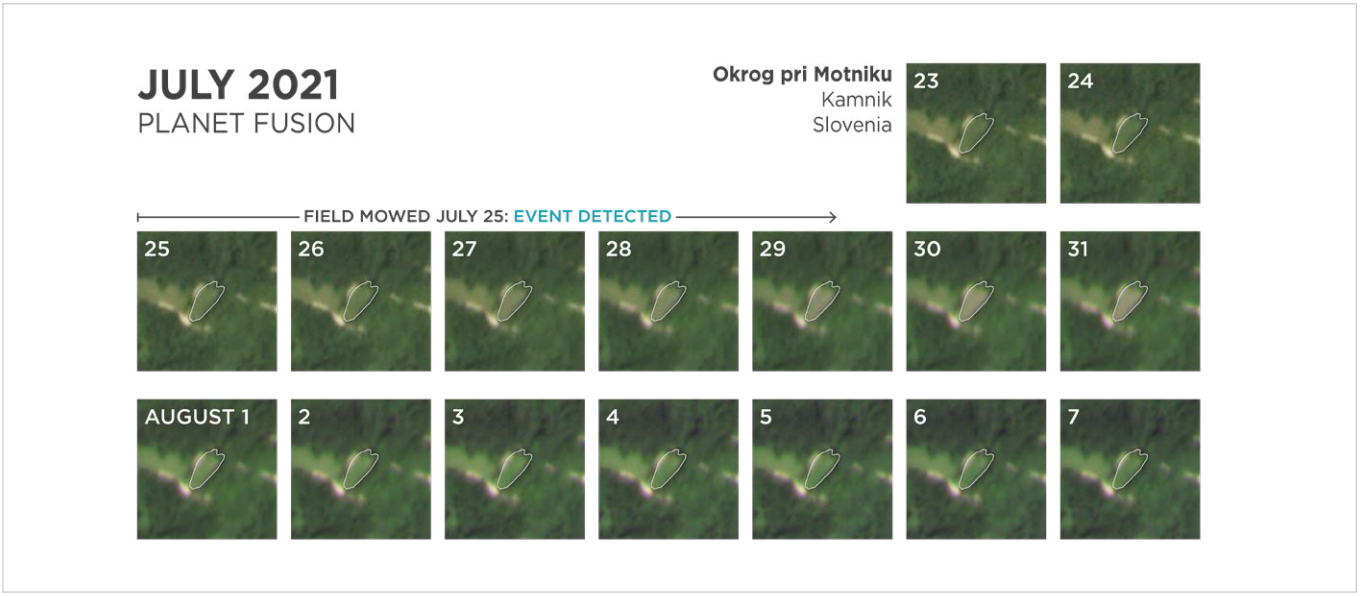
FUSION FOR EXPERT JUDGEMENT CHECKS

When an automated CbM is inconclusive, parcels are individually checked by the agency's experts using an Expert Judgment Tool in order to analyse whether the inconclusive result is actually due to the lack of an appropriate agricultural activity or due to misclassification of the ML-based models.

Operators can check the satellite data timelapse and other information derived from the models to make a quick judgment, typically in under thirty seconds, according to ARSKTRP. In about 20% of cases, experts turned to Planet Fusion to make a decision.

The remaining inconclusive parcels required a follow-up, either requesting the farmer for a geo-tagged photo or even a rapid field visit to the farm. The use of Planet Fusion have greatly minimized the need for these follow ups, saving ARSKTRP an additional €70,000.





> "Fusion data were found to be reliable and of good quality - we have received them in a timely fashion and were able to identify the needed agriculture activities to declare the parcel as compliant... We plan to continue using Planet Fusion data in the next year's Check by Monitoring as well as future Area Monitoring System activities, starting in 2023. With the push towards automated monitoring of all measures and biodiversity elements, the level of detail will become even more important."
>
> **LEA REMIC**
> Head of the Department for Geo-spatial Applications.

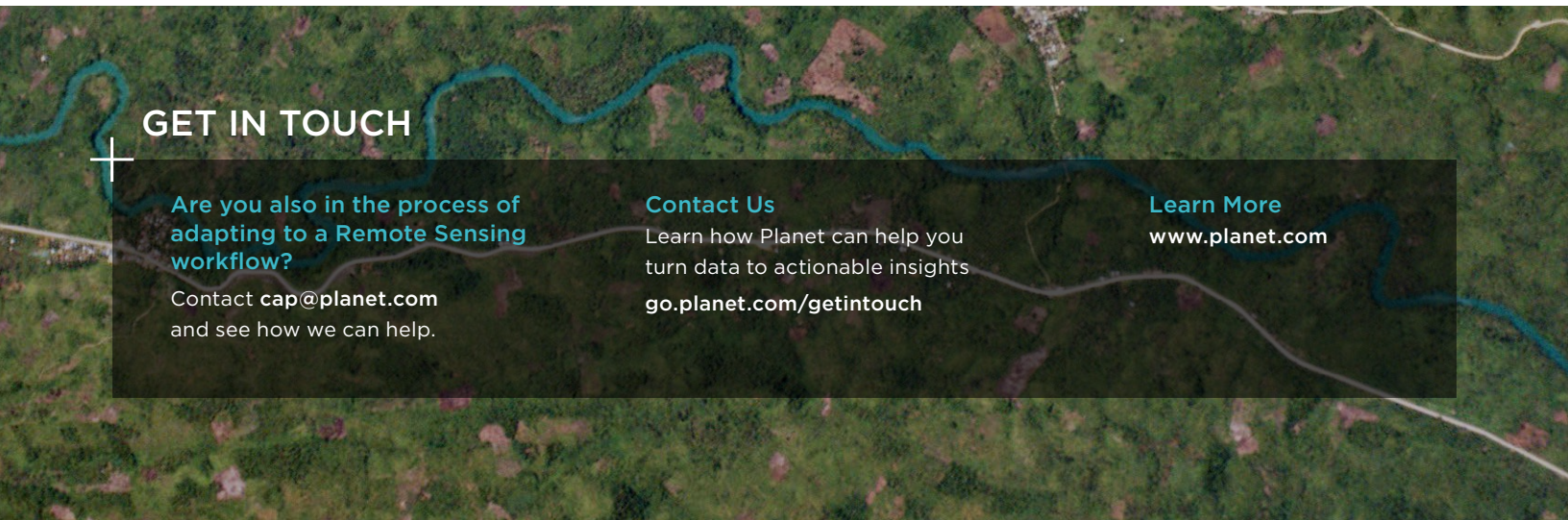
CONCLUSION

PLANET FUSION FOR IMPROVED OPERATIONAL EFFICIENCY OF AMS

Overall, Fusion assists ARSKTRP in improving the operational efficiency of remote sensing management of the CAP. Fusion data reduces the administrative burden of manually following up on more than 180,000 parcels. Increased spatial resolution and frequency helps complete automated checks of small or elongated parcels and thereby greatly reduces the personnel hours spent on time-consuming photo interpretation.

Moreover, improving the number of conclusive parcels results in fewer inquiries to farmers — less requests for geo-tagged photos, field visits, and other clarifications — therefore significantly improving the overall positive perception of the program.

All in all, ARSKTRP found that Planet's Fusion data offering serves as the best market supplement to Sentinel-2 with its daily EU-wide coverage and increased spatial resolution at 3m per pixel. This makes it a superb solution for the challenge of performing checks on small parcels and implementation in an AMS.



GET IN TOUCH

Are you also in the process of adapting to a Remote Sensing workflow?

Contact **cap@planet.com** and see how we can help.

Contact Us

Learn how Planet can help you turn data to actionable insights

go.planet.com/getintouch

Learn More

www.planet.com