

PLANET FUSION MONITORING Analyzing changing ground conditions

Fusion Monitoring helps you analyze changing ground conditions with more nuance and less processing and noise.

Increasing numbers of Earth observation satellites are generating massive amounts of remote sensing data and enabling powerful advances in technology for agriculture, forestry, and land use. But this ever increasing wealth of data also presents new challenges. Differences between satellites, gaps in coverage from cloud cover and infrequent revisit rates pose intricate and costly obstacles to using satellite data to support decision making.

To solve these problems, Planet has developed Fusion Monitoring. Fusion distills observations from multiple satellites into a unified, stable, and richly informative dataset. With its uninterrupted stream of data, free of clouds and gaps, Fusion Monitoring data is radiometrically consistent and ideal for time-series analysis, machine learning pipelines, and other applications that demand clean, consistent data. It is true analysis ready data.

A UNIFIED, STABLE, AND RICHLY INFORMATIVE DATA STREAM



The calendar shows the comparison from both the Landsat 8 and Sentinel-2, PlanetScope and Planet Fusion spatial resolution in September 2019 over North Platte, Nebraska.

COMPLETE, CONSISTENT, DAILY DATA BETTER INFORMS MODELING AND ON-THE-GROUND DECISIONS

By combining and refining many scenes from multiple sensors, a single day of Fusion data provides lower uncertainty, decreased noise, and reduced variance compared to the daily observations used to create it. Using Fusion provides specificity and confidence about when important changes occur and improves predictive analysis.

Fusion is analysis ready, which means your team has to spend less time and money processing data, and more time exploring a clean, complete dataset to drive creativity and innovation.

GREATER THAN THE SUM OF ITS PARTS

Planet's near-daily, 3.7 meter PlanetScope imagery offers an unparalleled data stream to fuse with Landsat and Sentinel data. By offering these integrated into a single radiometrically harmonized product Planet delivers the best model for understanding ground conditions as they change over time.

Planet Fusion's rigorous cloud and cloud shadow masking helps select the best pixel from multiple sensors. Where no observed data exists due to clouds or other gaps, Planet Fusion includes a layer of estimated radiometry based on a sophisticated, multi-year analysis model.

	SENTINEL-2	PLANET FUSION	
Spatial Resolution	10m	3m	
Revisit Time	3-4 days	Everyday	
Since	2016	2018	



Comparison of Sentinel-2 and Planet Fusion spatial resolution over fields outside of Garrafe de Torío, Spain. The increased spatial resolution offered by Planet allows for the clear identification of both field boundaries and variations within fields.

DRIVING IMPROVED YIELD ESTIMATION

Developing a predicted yield of any given field must take into account differences in management practices, geographical location, and weather conditions. Observations from remote sensing data, however, can be used to help predict end-of-season yields, especially if they can accurately capture the complete phenology of a crop's lifecycle over the course of a growing season.

Fusion's accurate daily data stream vastly increases the amount of usable information available for yield estimation and crop management models. With more consistent and accurate input data to draw from, operational decision support models powered by Fusion data show much higher performance with higher accuracy and improved precision. "Fusion means new opportunities to make more accurate yield projections, provide real-time crop health monitoring, and guide precision irrigation, ultimately giving us an opportunity to drive more value for farmers."

RINKAL PATEL

Senior Technical Manager Corteva Agriscience



"We can transition from 'What is there?" to 'Why is it there?"

ADAM WOLF

Chief Scientist, Arable Labs

Planet Fusion NDVI data is plotted over the 2019 growing season in North Platte Nebraska along with observations from Landsat 8 and Sentinel-2, as well as ground truth data collected from Arable.

PLANET FUSION PRODUCT SPECIFICATIONS

PF-SR	Planet Fusion Surface Reflectance (SR) product. PS TOAR Reflectance radiometrically harmonized to 4-band. Cloud masked and gap-filled via a model that fully integrates all available observations from PlanetScope, MODIS/VIIRS, Sentinel-2 and Landsat 8.		
PF-QA	Planet Fusion Quality Assurance product		
Temporal coverage	Daily		
Pixel Size	3m		
Bit Depth	16-bit		
Spectral Bands	Blue (0.45 - 0.51 μm) SR (NBAR); Green (0.53 - 0.59 μm) SR (NBAR); Red (0.64 - 0.67 μm); NIR (0.85 - 0.88 μm)		
Latency	48 hours for forward-fill		
Tile Size	24 km (8000 lines) by 24 km (8000 columns)		
Metadata	9 layers of 16-bit signed integer data. Layer 1: Percentage of gap-filled data ; Layer 2: Days to closest scene with actual observation; Layer 3: PlanetScope Cloud and cloud shadow; Layer 4: PlanetScope pixel traceability mask; Layer 5: Total number of FORCE L8/S2 reference scenes used during calibration; Layers 6-9 spectral band band uncertainty estimates		

