PIXXEL DATA SPECIFICATIONS

Inquiries - Write to support@pixxel.space

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1. PIXXEL OVERVIEW

This document describes Pixxel satellite imagery and platform products. It is intended for satellite imagery users interested in working with Pixxel's product offerings.

1.1. COMPANY OVERVIEW

Pixxel is a space data company, building a constellation of hyperspectral Earth imaging satellites and the analytical tools to mine insights from that data. The constellation is designed to provide global coverage every 24 hours, to detect, monitor, and predict global phenomena.

1.2. DATA PRODUCT OVERVIEW

Pixxel currently provides these data products:

VNIR Imagery

Hyperspectral Visible and Near Infrared (VNIR) Product (470-900 nm) from the Technology Demonstrator satellites and Firefly satellites upon launch in 2025

SWIR Imagery

Hyperspectral Short Wave Infrared (SWIR) Product (900-2500 nm) from the Honeybee satellites upon launch in 2026

Upon the launch of the Firefly and Honeybee constellations, the data can be provided either as a VNIR or SWIR product separately or as a combined product.

1.3. PIXXEL CONSTELLATION OVERVIEW

Satellite	Wavelength range	Spatial Resolution (GSD)	Number of Satellites	Status
Fireflies	470-900 nm (VNIR)	5m	18	To launch in Q1 & Q2 2025
Honeybees	470–2500 nm (VNIR/SWIR)	5m	6	To launch in 2026

2. PIXXEL COMMERCIAL CONSTELLATION AND SENSOR OVERVIEW

Parameters	Firefly Constellation	Honeybee Constellation
Ground Spatial Distance (GSD)	5.36 meters	5 meters
Swath	40 km	10 km SWIR 30 km VNIR
Wavelength range	470 - 900 nm	470 - 2500 nm
Satellite total available bands	150 bands	~160 VNIR, ~100 SWIR
Total selectable bands	45 bands	Total: 72, VNIR - 46, SWIR - 26
Orbit	Sun Synchronous Orbit (SSO), 97.65° inclination	Sun Synchronous Orbit (SSO), 97.45° inclination
Altitude	590 km	550 km (TBD)
Equator Crossing Time	10 - 11 AM	10 - 11 AM
Off-nadir angle (ONA)/slew	+/- 20° (+/-10° recommended)	+/- 20° (+/-10° recommended)
Revisit time	1 - 4 days	1 - 4 days
Cloud cover thresholds*	<20%	<20%
Imagery bit depth	10 bits of dynamic range, stretched to fill a 16-bit container	10 bits of dynamic range, stretched to fill a 16-bit container

*Predicted cloud cover may have inaccuracies

3. PRODUCT PROCESSING

IMAGE PROCESSING LEVELS

Name	Description	Product Level
Bottom of Atmosphere (BOA) reflectance	This is radiometric, geometric, and atmospheric (aerosol and water vapor)-corrected BOA reflectance data. The image is orthorectified and projected to WGS84 projection. The data is available in a geoTIFF file format (accompanied by additional metadata). The pixel reflectance values are linearly scaled between 0 - 50000. Thus to convert the image to 0-1 reflectance range, all the pixel values must be divided by 50000.	L2A
Top of Atmosphere (TOA) reflectance	This is radiometric, and geometric corrected TOA reflectance data. The image is orthorectified and projected to WGS84 projection. The data is available in a geoTIFF file format (accompanied by additional metadata). The pixel reflectance values are linearly scaled between 0 - 50000. Thus to convert the image to 0-1 reflectance range, all the pixel values must be divided by 50000.	L1C (available upon request)
Top of Atmosphere (TOA) radiance	This is radiometric, and geometrically corrected TOA radiance (also termed at-sensor radiance) data. The image is orthorectified using a customer-requested projection. The data is available in a geoTIFF file format (accompanied by additional metadata). This level may be available on request. The pixel values are not scaled and the values have radiance units - $W \cdot m^{-2} \cdot sr^{-1} \cdot \mu m^{-1}$	L1B (available upon request)