

**Digital Globe Satellite Imagery**



**Worldview - 02**

<b>Launch Date</b>	<b>October 8, 2009</b>
<b>Launch Vehicle</b>	Delta 7920 (9 strap-ons)
<b>Launch Site</b>	Vandenberg Air Force Base
<b>Orbit Altitude</b>	770 kilometers
<b>Orbit Type</b>	Sun synchronous, 10:30 am (LT) descending Node
<b>Orbit Period</b>	100 minutes; 7.25 year mission life, including all consumables and degradables (e.g., propellant)
<b>Spacecraft Size, Mass, &amp; Power</b>	4.3 meters (14 feet) tall x 2.5 meters (8 feet) across, 7.1 meters (23 feet) across the deployed solar arrays; 2800 kilograms (6200 pounds); 3.2 kW solar array, 100 Ahr battery
<b>Sensor Bands</b>	Panchromatic 8 Multispectral (4 standard colors: red, blue, green, near-IR), 4 new colors: red edge, coastal, yellow, near-IR2
<b>Sensor Resolution GSD</b>	Ground Sample Distance Panchromatic: 0.46 meters GSD at Nadir, 0.52 meters GSD at 20° Off-Nadir Multispectral: 1.84 meters GSD at Nadir, 2.4 meters GSD at 20° Off-Nadir

<b>Dynamic Range</b>	11-bits per pixel
<b>Time Delay Integration (TDI)</b>	Panchromatic - 6 selectable levels from 8 to 64 Multispectral - 7 selectable levels from 3 to 24
<b>Swath Width</b>	16.4 kilometers at nadir

Satellite Imagery Sensor Resolution 0.5m



<b>Attitude Determination and Control</b>	<b>3-axis stabilized</b>
<b>Actuators</b>	Control Moment Gyros (CMGs)
<b>Sensors</b>	Star trackers, solid state IRU
<b>GPS Position Accuracy &amp; Knowledge</b>	< 500 meters at image start and stop Knowledge: Supports geolocation accuracy below Retargeting
<b>Agility Acceleration</b>	1.5 deg/s/s Rate: 3.5 deg/s Time to slew 300 kilometers: 9 seconds
<b>Onboard Storage</b>	2199 gigabits solid state with EDAC Communications Image and Ancillary Data: 800 Mbps X-band
<b>Housekeeping</b>	4, 16 or 32 kbps real-time, 524 kbps stored, X-band
<b>Command</b>	2 or 64 kbps S-band
<b>Max Viewing Angle</b>	Accessible Ground Swath Nominally +/-40° off-nadir = 1355 km wide swath Higher angles selectively available Per Orbit Collection: 524 gigabits Max Contiguous Area Collected in a Single Pass: 96 x 110 km mono, 48 x 110 km stereo
<b>Revisit Frequency</b>	1.1 days at 1 meter GSD or less 3.7 days at 20° off-nadir or less (0.52 meter GSD)
<b>Geolocation Accuracy</b>	Demonstrated <3.5 m CE90 without ground control

**Worldview - 01**

**About WorldView-1**

WorldView-1 is an environment-monitoring satellite from Maxar of the United States which launched on 18 September 2007 and remains operational.

It became the world's first 50 cm resolution commercial imaging satellite.

*Mission Parameters*

<b>Orbit Altitude</b>	496 km
<b>Orbit Type</b>	Sun-synchronous
<b>Orbit Period</b>	94.6 minutes
<b>Orbit Inclination</b>	97.2°
<b>Repeat Cycle</b>	14 days
<b>Equator Crossing Time</b>	10:30 am descending node
<b>Revisit Time</b>	1.7 days at 1-metre GSD resolution
<b>Detectors</b>	- Silicon CCD array (8 µm pixel size) with a row of > 35,000 detectors - The array includes 64 stages of TDI (35,000 columns and 64 rows)
<b>TDI (Time Delay Integration)</b>	6 selectable levels from 8 to 64
<b>Data Quantization</b>	11 bit
<b>Geolocation accuracy of imagery after processing</b>	- 5.8 to 7.6 m without GPCs - 2 m with GPCs
<b>Instrument Mass, Power</b>	380 kg, 250 W



## WorldView-3

### WorldView-110 camera (WV110)

This instrument collects images at 0.31 metre panchromatic and 1.24 metre in the eight VNIR bands, 3.7m in the eight SWIR bands and a 30 m resolution in the CAVIS (Clouds, Aerosols, Vapours, Ice and Snow) bands.

WorldView-3 has bands for enhanced multispectral analysis (coastal blue, yellow, red edge, NIR2) designed to improve segmentation and classification of land and aquatic features.

WV110 Parameters			
Spectral range	Band name	Spectral band	GSD (Ground Sample Distance)
<b>Panchromatic Band (1)</b>		450 - 800 nm	Nadir: 0.31 m, 20° off-nadir: 0.34 m
<b>MS (Multispectral) Bands (8) in VNIR (Visible Near Infrared)</b>	Coastal Blue	400 - 450 nm	Nadir: 1.24 m 20° off-nadir: 1.38 m
	Blue	450 - 510 nm	
	Green	510 - 580 nm	
	Yellow	585 - 625 nm	
	Red	630 - 690 nm	
	Red edge	705 - 745 nm	
	Near-IR1	770 - 895 nm	
	Near-IR2	860 - 1040 nm	
<b>Multiband (8 bands) in SWIR (Shortwave Infrared) spectral range</b>	SWIR-1	1195 - 1225 nm	Nadir: 3.70 m 20° off-nadir: 4.10 m
	SWIR-2	1550 - 1590 nm	
	SWIR-3	1640 - 1680 nm	
	SWIR-4	1710 - 1750 nm	
	SWIR-5	2145 - 2185 nm	
	SWIR-6	2185 - 2225 nm	
	SWIR-7	2235 - 2285 nm	
	SWIR-8	2295 - 2365 nm	
<b>CAVIS bands (12) CAVIS (Clouds, Aerosols, Vapors, Ice, &amp; Snow)</b>	Desert clouds	405 - 420 nm	Nadir: 30 m
	Aerosols-1	459 - 509 nm	
	Green	525 - 585 nm	
	Aerosols-2	620 - 670 nm	
	Water-1	845 - 885 nm	
	Water-2	897 - 927 nm	
	Water-3	930 - 965 nm	
	NDVI-SWIR	1220 - 1252 nm	
	Cirrus	1350 - 1410 nm	
	Snow	1620 - 1680 nm	
	Aerosol-3	2105 - 2245 nm	
	Aerosol-3	2105 - 2245 nm	
<b>Data quantization</b>	11 bit/pixel Pan and MS; 14 bit/pixel SWIR		
<b>Swath width</b>	13.1 km		
<b>Revisit frequency (at 40° N latitude)</b>	1 m GSD: < 1.0 day 4.5 days at 20° off-nadir or less		
<b>Geolocation accuracy</b>	< 3.0 m CE90 (Circular Error of 90%)		

# High resolution data support sustainable farming

