The 8 spectral bands of WorldView-2

Pan
Coastal
Blue
Green
Yellow
Red
Red Edge
NIR1
NIR2

350   450   550   650   750   850   950   1050

Wavelength (nm)

Feature Classification

Sucessfully launched on October 8, 2009, WorldView-2 is the first high resolution satellite to provide half-meter panchromatic resolution and two meter multispectral resolution across 8 spectral bands. With unprecedented agility and a collection capacity of 975,000 km2 per day, WorldView-2 doubles the Alliance's collection capacity and provides worldwide intra-day revisit capabilities.
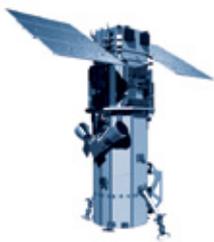
WorldView-2 is the first high-resolution satellite to provide 8 narrowly focused spectral detectors ranging from blue to near infrared. The unparalleled spectral fidelity, combined with an expected unsurpassed accuracy, agility and collection capacity, will deliver detailed feature classification capabilities, beyond any other remote sensing satellite.

With the addition of 4 new spectral bands: Coastal Blue (400-450), Yellow (585-625), Red-Edge(705-745) and NearIR-2 (860-1040), WorldView-2 can deliver an increase in classification accuracy of 20-30% over analyses that employ the traditional four bands. The increased classification accuracy, coupled with 2m spatial resolution and wide scale synoptic coverage will enable the discrimination of vegetation by species, allow finer object oriented classification and providemeasureable value in public and private sector applications.

APPLICATIONS

Species identification
Wild plant populations are much more complex than organized farmlands, consisting of multiple species. Some are invasive pests, while others have potential value. With the increased spectral fidelity of WorldView-2, plant species can be differentiated from each other and accurately mapped.

Feature extraction
Object oriented methodologies are proving to be the most successful at differentiating between features with similar spectral properties, like asphalt roofing and asphalt roadways. With the highest spectral fidelity, plus the greatest spatial resolution, WorldView-2 is expected to deliver on the potential for automated feature extraction.

Civil government
Understanding land use is critical for managing city resources and collecting tax revenue. WorldView-2's increased classification accuracy will provide direct impact into a city's budget and expenses.

BENEFITS

- Map invasive species such as Kudzu or Chinese Tallow that can be harvested for biofuel production
- Identify plant species within a wetland that can indicate non-visible pollution, like high acidity
- Determine the logging value of a managed forest by quantifying trees by species

- Automate roadway extraction to create current and accurate maps
- Detect minerals on bare soil that indicate seepage from abandoned mines, or natural oil deposits
- Model potential damage from high winds based on roof type and their risk to become projectiles

- Accurately quantify and qualify land parcels, to assess property taxes and storm-water fees
- Locate non-permitted construction by identifying spectral changes around existing structures
- Remotely identify roads in need of maintenance to more efficiently manage resurfacing projects

With the increased spectral fidelity and spatial resolution of WorldView-2 detailed and increasingly automated feature extraction will become a reality, enabling better, faster decision making.

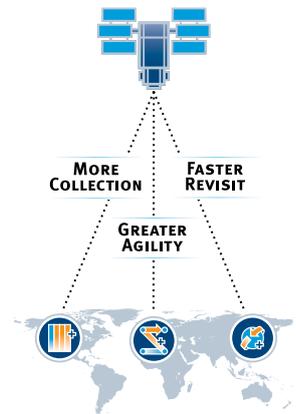WorldView Global Alliance™ delivers geospatial content the way you want it, when you want it. *We provide clearer, more accurate visual perspectives for spatial applications and decisions.* ▶
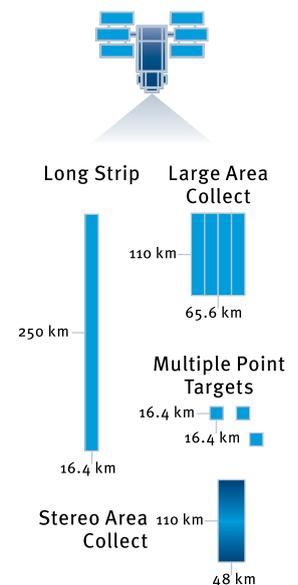
DESIGN AND SPECIFICATIONS

Launch Information	Date: October 8, 2009 Launch Vehicle: Delta 7920 (9 strap-ons) Launch Site: Vandenberg Air Force Base
Orbit	Altitude: 770 kilometers Type: Sun synchronous, 10:30 am descending node Period: 100 minutes
Mission Life	7.25 years, including all consumables and degradables (e.g. propellant)
Spacecraft Size, Mass and Power	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
Sensor Bands	Panchromatic + 8 Multispectral: 4 standard colors: red, blue, green, near-IR 4 new colors: red edge, coastal, yellow and near-IR2
Sensor Resolution	Panchromatic: 0.46 meters GSD at nadir, 0.52 meters GSD at 20° off-nadir Multispectral: 1.84 meters GSD at nadir, 2.08 meters GSD at 20° off-nadir
Dynamic Range	11-bits per pixel
Swath Width	16.4 kilometers at nadir
Attitude Determination and Control	3-axis Stabilized Actuators: Control Moment Gyros (CMGs) Sensors: Star trackers, solid state IRU, GPS
Pointing Accuracy and Knowledge	Accuracy: <500 meters at image start and stop Knowledge: Supports geolocation accuracy below
Retargeting Agility	Acceleration: 1.5 deg/s/s Rate: 3.5 deg/s Time to Slew 300 kilometers: 9 seconds
Onboard Storage	2199 gigabits solid state with EDAC
Communications	Image and Ancillary Data: 800 Mbps X-band Housekeeping: 4, 16 or 32 kbps real-time, 524 kbps stored, X-band Command: 2 or 64 kbps S-band
Max Viewing Angle / Accessible Ground Swath	Nominally +/-45° 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
Revisit Frequency	1.1 days at 1 meter GSD or less 3.7 days at 20° off-nadir or less (0.52 meter GSD)
Geolocation Accuracy (CE90%)	Specification of 6.5m CE90, with predicted performance in the range of 4.6 to 10.7 meters (15 to 35 feet) CE90, excluding terrain and off-nadir effects With registration to GCPs in image: 2.0 meters (6.6 feet)

MORE COLLECTION   FASTER REVISIT

GREATER AGILITY

COLLECTION SCENARIOS

Long Strip   Large Area Collect

110 km

250 km

65.6 km

Multiple Point Targets

16.4 km

16.4 km

16.4 km

Stereo Area Collect   110 km

48 km

SENSOR BANDS

Panchromatic

Multispectral

4 Additional Bands

To learn more about the Alliance and its members, or to contact us visit: **www.worldviewglobalalliance.com**

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