



## WorldView-3

Introducing WorldView-3, the first multi-payload, super-spectral, high-resolution commercial satellite. Operating at an expected altitude of 617 km, WorldView-3 provides 31 cm panchromatic resolution, 1.24 m multispectral resolution, 3.7 m short-wave infrared resolution, and 30 m CAVIS resolution. WorldView-3 has an average revisit time of <1 day and is capable of collecting up to 680,000 km<sup>2</sup> per day, further enhancing the DigitalGlobe collection capacity for more rapid and reliable collection. Launching in 2014, the WorldView-3 system will allow DigitalGlobe to further expand its imagery product offerings.

### Features

- » Very high-resolution\*
  - Panchromatic 31 cm
  - Multispectral 1.24 m
  - Short-wave infrared 3.7 m
  - CAVIS 30 m\*Will be resampled for commercial distribution
- » The most spectral diversity commercially available
  - Panchromatic band
  - 4 standard VNIR colors: blue, green, red, near-IR1
  - 4 added VNIR colors: coastal, yellow, red edge, and near-IR2
  - 8 SWIR bands: Penetrates haze, fog, smog, dust, smoke, mist, and cirrus
  - 12 CAVIS bands: Corrects for clouds, aerosols, vapors, ice, and snow
- » Industry-leading geolocation accuracy
- » High capacity in various collection modes
- » Bi-directional scanning
- » Rapid retargeting using Control Moment Gyros (>2x faster than any competitor)
- » Direct Access tasking from and image transmission to customer sites
- » Daily revisits

### Benefits

- » Simultaneous, high resolution, super-spectral imagery
- » Large area mono and stereoscopic collection eliminates temporal variations
- » Precision geo-location possible without ground control points
- » Global capacity of 680,000 km<sup>2</sup> per day
- » New and enhanced applications, including:
  - Mapping
  - Land Classifications
  - Disaster Preparedness/Response
  - Feature Extraction/Change Detection
  - Soil/Vegetative Analysis
  - Geology: Oil & Gas, Mining
  - Environmental Monitoring
  - Bathymetry/Coastal Applications
  - Identification of Man-made Materials
- » Superior Haze Penetration



WorldView-3 artist rendering

## Design and specifications

|  |   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
|--|---|-----------------------|-------------------|--------------------|------------------------|---------------------|------------------------|----------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------------|-----------------------|-------------------------|---------------------------|---------------------|------------------------|-------------------------|----------------------|-----------------------|---------------------------|-----------------------|---------------------------|
| <b>Orbit</b>   | Altitude: 617 km<br>Type: SunSync, 1:30 pm descending Node<br>Period: 97 min.   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Life</b>  | Spec Mission Life: 7.25 years<br>Estimated Service Life: 10 to 12 years   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Spacecraft Size, Mass and Power</b>   | Size: 5.7 m (18.7 ft) tall x 2.5 m (8 ft) across<br>7.1 m (23 ft) across deployed solar arrays<br>Mass: 2800 kg (6200 lbs)<br>Power: 3.1 kW solar array, 100 Ahr battery  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Sensor Bands</b>  | <p>Panchromatic: 450 - 800 nm</p> <p>8 Multispectral:</p> <table border="0"> <tr> <td>Coastal: 400 - 450 nm</td> <td>Red: 630 - 690 nm</td> </tr> <tr> <td>Blue: 450 - 510 nm</td> <td>Red Edge: 705 - 745 nm</td> </tr> <tr> <td>Green: 510 - 580 nm</td> <td>Near-IR1: 770 - 895 nm</td> </tr> <tr> <td>Yellow: 585 - 625 nm</td> <td>Near-IR2: 860 - 1040 nm</td> </tr> </table> <p>8 SWIR Bands:</p> <table border="0"> <tr> <td>SWIR-1: 1195 - 1225 nm</td> <td>SWIR-5: 2145 - 2185 nm</td> </tr> <tr> <td>SWIR-2: 1550 - 1590 nm</td> <td>SWIR-6: 2185 - 2225 nm</td> </tr> <tr> <td>SWIR-3: 1640 - 1680 nm</td> <td>SWIR-7: 2235 - 2285 nm</td> </tr> <tr> <td>SWIR-4: 1710 - 1750 nm</td> <td>SWIR-8: 2295 - 2365 nm</td> </tr> </table> <p>12 CAVIS Bands:</p> <table border="0"> <tr> <td>Desert Clouds: 405 - 420 nm</td> <td>Water-3: 930 - 965 nm</td> </tr> <tr> <td>Aerosol-1: 459 - 509 nm</td> <td>NDVI-SWIR: 1220 - 1252 nm</td> </tr> <tr> <td>Green: 525 - 585 nm</td> <td>Cirrus: 1350 - 1410 nm</td> </tr> <tr> <td>Aerosol-2: 620 - 670 nm</td> <td>Snow: 1620 - 1680 nm</td> </tr> <tr> <td>Water-1: 845 - 885 nm</td> <td>Aerosol-3: 2105 - 2245 nm</td> </tr> <tr> <td>Water-2: 897 - 927 nm</td> <td>Aerosol-3: 2105 - 2245 nm</td> </tr> </table> | Coastal: 400 - 450 nm | Red: 630 - 690 nm | Blue: 450 - 510 nm | Red Edge: 705 - 745 nm | Green: 510 - 580 nm | Near-IR1: 770 - 895 nm | Yellow: 585 - 625 nm | Near-IR2: 860 - 1040 nm | SWIR-1: 1195 - 1225 nm | SWIR-5: 2145 - 2185 nm | SWIR-2: 1550 - 1590 nm | SWIR-6: 2185 - 2225 nm | SWIR-3: 1640 - 1680 nm | SWIR-7: 2235 - 2285 nm | SWIR-4: 1710 - 1750 nm | SWIR-8: 2295 - 2365 nm | Desert Clouds: 405 - 420 nm | Water-3: 930 - 965 nm | Aerosol-1: 459 - 509 nm | NDVI-SWIR: 1220 - 1252 nm | Green: 525 - 585 nm | Cirrus: 1350 - 1410 nm | Aerosol-2: 620 - 670 nm | Snow: 1620 - 1680 nm | Water-1: 845 - 885 nm | Aerosol-3: 2105 - 2245 nm | Water-2: 897 - 927 nm | Aerosol-3: 2105 - 2245 nm |
| Coastal: 400 - 450 nm  | Red: 630 - 690 nm   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| Blue: 450 - 510 nm   | Red Edge: 705 - 745 nm  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| Green: 510 - 580 nm  | Near-IR1: 770 - 895 nm  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| Yellow: 585 - 625 nm   | Near-IR2: 860 - 1040 nm   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| SWIR-1: 1195 - 1225 nm   | SWIR-5: 2145 - 2185 nm  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| SWIR-2: 1550 - 1590 nm   | SWIR-6: 2185 - 2225 nm  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| SWIR-3: 1640 - 1680 nm   | SWIR-7: 2235 - 2285 nm  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| SWIR-4: 1710 - 1750 nm   | SWIR-8: 2295 - 2365 nm  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| Desert Clouds: 405 - 420 nm  | Water-3: 930 - 965 nm   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| Aerosol-1: 459 - 509 nm  | NDVI-SWIR: 1220 - 1252 nm   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| Green: 525 - 585 nm  | Cirrus: 1350 - 1410 nm  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| Aerosol-2: 620 - 670 nm  | Snow: 1620 - 1680 nm  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| Water-1: 845 - 885 nm  | Aerosol-3: 2105 - 2245 nm   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| Water-2: 897 - 927 nm  | Aerosol-3: 2105 - 2245 nm   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Sensor Resolution (or GSD, Ground Sample Distance; off-nadir is geometric mean)</b> | Panchromatic Nadir: 0.31 m<br>20° Off-Nadir: 0.34 m<br>Multispectral Nadir: 1.24 m<br>20° Off-Nadir: 1.38 m<br>SWIR Nadir: 3.70 m<br>20° Off-Nadir: 4.10 m<br>CAVIS Nadir: 30.00 m  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Dynamic Range</b>   | 11-bits per pixel Pan and MS; 14-bits per pixel SWIR  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Swath Width</b>   | At nadir: 13.1 km   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Attitude Determination and Control</b>  | Type: 3-axis Stabilized<br>Actuators: Control Moment Gyros (CMGs)<br>Sensors: Star trackers, precision IRU, GPS   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Pointing Accuracy and Knowledge</b>   | Accuracy: <500 m at image start/stop<br>Knowledge: Supports geolocation accuracy below  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Retargeting Agility</b>   | Time to Slew 200 km: 12 sec   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Onboard Storage</b>   | 2199 Gb solid state with EDAC   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Communications</b>  | Image & Ancillary Data: 800 and 1200 Mbps X-band<br>Housekeeping: 4, 16, 32, or 64 kbps real time, 524 kbps stored, X-band<br>Command: 2 or 64 kbps S-band  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Max Contiguous Area Collected in a Single Pass (30° off-nadir angle)</b>            | Mono: 66.5 km x 112 km (5 strips)<br>Stereo: 26.6 km x 112 km (2 pairs)   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Revisit Frequency (at 40°N Latitude)</b>  | 1 m GSD: <1.0 day<br>4.5 days at 20° off-nadir or less  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Geolocation Accuracy (CE90)</b>   | Predicted <3.5 m CE90 without ground control  |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |
| <b>Capacity</b>  | 680,000 km <sup>2</sup> per day   |                       |                   |                    |                        |                     |                        |                      |                         |                        |                        |                        |                        |                        |                        |                        |                        |                             |                       |                         |                           |                     |                        |                         |                      |                       |                           |                       |                           |

## Collection scenarios



## Sensor bands

-  Panchromatic
-  Multispectral
-  4 additional multispectral bands
-  8 SWIR bands
-  12 CAVIS bands