

Bathymetry



WorldView-2 is the first high-resolution multispectral satellite to provide eight spectral sensors, enabling it to see further into the water and support bathymetric studies around the globe. Remote sensing of the shallow ocean floor has become much clearer as a result of the additional spectral bands, including Coastal Blue. Researchers have shown that the combination of Coastal Blue with Yellow, and the more tightly focused Green Band, can discriminate underwater features more efficiently with remarkable accuracy, agility, and collection capacity.

Applications

Updating navigational hazards

Current nautical charts are critical to the safety of marine navigation. Global coverage and continuous collections allow you to create and update charts rapidly.

Coastal modeling

Predicting the effects of storm surge and tsunamis requires a detailed understanding of the near-shore environment. Photogrammetric techniques allow the entire coastline to be mapped simultaneously above and below the water, providing unprecedented continuity and critical insights.

Marine habitat monitoring

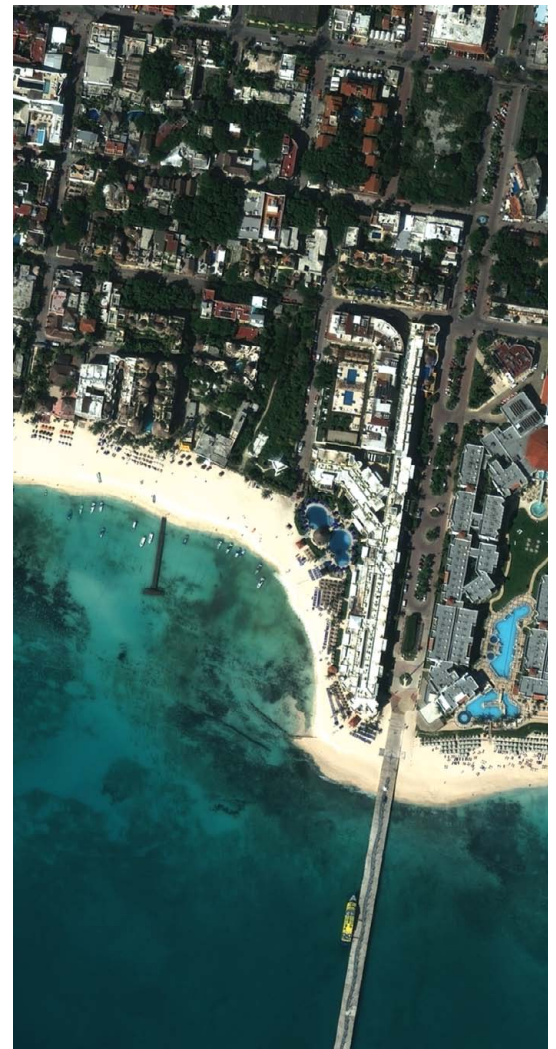
Government agencies monitor coastal areas to document changes to protected habitats. The ability to map large underwater areas and classify marine habitats with great detail will enable more efficient responses and a better understanding of the environment.

Benefits

- Provide navigational charts for remote places
- Frequent updates
- Locate debris deposited by storms for efficient cleanup

- Map at-risk properties and infrastructure
- Model the effects of storm surge for emergency response
- Rapidly conduct shoreline change analyses

- Identify changes that can indicate the early effects of pollution
- Develop accurate models of reef recovery
- Monitor the coastal impact from offshore projects

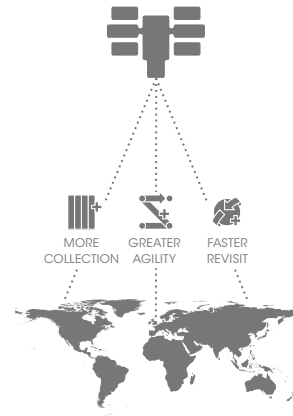


Playa del Carmen, Mexico
Collected December 6, 2010

Bathymetry

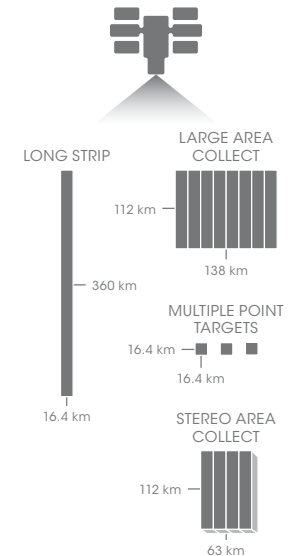
Design and Specifications

Launch Information	Date: October 8, 2009 Launch Vehicle: Delta 7920 (9 strap-ons) Launch Site: Vandenberg Air Force Base, California
Orbit	Altitude: 770 km Type: Sun synchronous, 10:30 am descending node Period: 100 min
Mission Life	7.25 years, including all consumables and degradables (e.g. propellant)
Spacecraft Size, Mass and Power	4.3 m (14 ft) tall x 2.5 m (8 ft) across 7.1 m (23 ft) across the deployed solar arrays 2800 kg (6200 lbs) 3.2 kW solar array, 100 Ahr battery
Sensor Bands	Panchromatic: 450 - 800 nm 8 Multispectral: 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
Sensor Resolution	Panchromatic: 0.46 m GSD at nadir, 0.52 m GSD at 20° off-nadir Multispectral: 1.85 m GSD at nadir, 2.07 m GSD at 20° off-nadir
Dynamic Range	11-bits per pixel
Swath Width	16.4 km 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 m at image start and stop Knowledge: Supports geolocation accuracy below
Retargeting Agility	Acceleration: 1.43 deg/s/s Rate: 3.86 deg/s Time to Slew 200 km: 10 sec
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 = 1651 km wide swath Higher angles selectively available
Max Contiguous Area Collected in a Single Pass (30° off-nadir angle)	Mono: 138 x 112 km (8 strips) Stereo: 63 x 112 km (4 pairs)
Revisit Frequency (at 40°N Latitude)	1.1 days at 1 m GSD or less 3.7 days at 20° off-nadir or less (0.52 m GSD)
Geolocation Accuracy (CE90)	Specification of 5 m CE90 at less than 30° off-nadir, with predicted performance in the range of 4.6 to 10.7 m (15 to 35 ft) CE90, excluding terrain and off-nadir effects With registration to GCPs in image: 2.0 m (6.6 ft)



Collection Scenarios

(30° off-nadir angle)



Sensor Bands

- Panchromatic
- Multispectral
- 4 Additional Bands

U.S. Regulation requires imagery to be resampled to a minimum of 50 m pan and 2.0 m multispectral.