

GeoEye satellites capture sub-metre imagery simultaneously in natural colour and colour infra-red. With a revisit rate of 2 to 4 days, and an extensive archive, high resolution satellite imagery has proven to be a reliable source for many resource, engineering and planning applications.

AOC offers fully orthorectified, mosaiced and colour-balanced datasets which can be custom processed and formatted. Existing terrain models from a range of sources (including LiDAR) can be used to enhance the accuracy of many satellite products.

## Benefits of using satellite imagery:

- Fast turn-around time
- Extensive archives
- Easy access to remote areas
- Stereo capture for digital elevation model generation
- Cost effective datasets
- Georeferenced and GIS ready

## Available Products

### Georeferenced or Orthorectified Imagery

- 0.5m natural or false colour or 4 band multispectral\*
- 0.8m natural or false colour or 4 band multispectral\*
- 1.6m 4 band multispectral
- 3.2m 4 band multispectral
- 0.5m or 0.8m panchromatic imagery

### Digital Elevation Models

- Input: 0.5m or 0.8m 4 band multispectral stereo pair\*
- Output: DTM and 2m or 5m contours

*\*Pansharpened product*



Above: GeoEye-1 image (0.5m resolution) over Cape Town, South Africa.

# Comparing IKONOS and GeoEye-1 Imagery

Specifications	IKONOS	GeoEye-1 Imagery
<b>Pixel Size:</b> Panchromatic Multispectral (4 band)	0.82m (at nadir) 0.82m or 3.28m (at nadir)	0.5m* 0.5m* or 1.65m
<b>Collection Capacity</b> (at 30° latitude)	Approx 3 days	Approx 3 days
<b>Swath Width at Nadir</b>	~11.3km	~15.2km
<b>Dynamic Range</b>	11 bits per pixel	11 bits per pixel
<b>Time of Satellite Overpass</b>	Approx 10:30am (worldwide)	Approx 10:30am (worldwide)
<b>Band Spectral Range</b> - Panchromatic (B&W) - Blue - Green - Red - NIR	526 – 929nm 445 – 516nm 506 – 595nm 632 – 698nm 757 – 853nm	450 – 800nm 450 – 510nm 510 – 580nm 655 – 690nm 780 – 920nm

\* Captured at 0.41m at nadir, resampled to 0.5m

The IKONOS satellite provides global 0.8m resolution imagery that enables mapping at 1:4,000 scale. The repeat capture capability allows monitoring of areas of interest on a regular basis. The latest generation GeoEye-1 satellite provides multispectral imagery with a 0.5m resolution (although captured at 0.41m at nadir). GeoEye-1 captures the world's highest spatial resolution and is one of the most accurate satellite data sources, which in combination with IKONOS allows a repeatable capture over the same site on an almost daily basis.



Above: Comparing 0.8m imagery (left) and 0.5m imagery (right)

# Case Study: Imagery and Terrain Data from the IKONOS Satellite

The agile IKONOS and GeoEye-1 satellites capture stereo imagery in the same overpass, which enables the generation of high resolution Digital Elevation Models (DEMs). A 154 sqkm exploration area in Western Australia was captured by IKONOS in stereo for the creation of a high resolution elevation model and orthoimage. Eight ground control points were supplied for the image processing.

Final deliverables for this project were:

- 2.4m DEM (ASCII Grid format) - from which 2m contours could be derived
- 0.8m colour orthoimagery

## Product accuracies achieved

### Orthoimage (IKONOS)

Horizontal X – RMS 0.47m

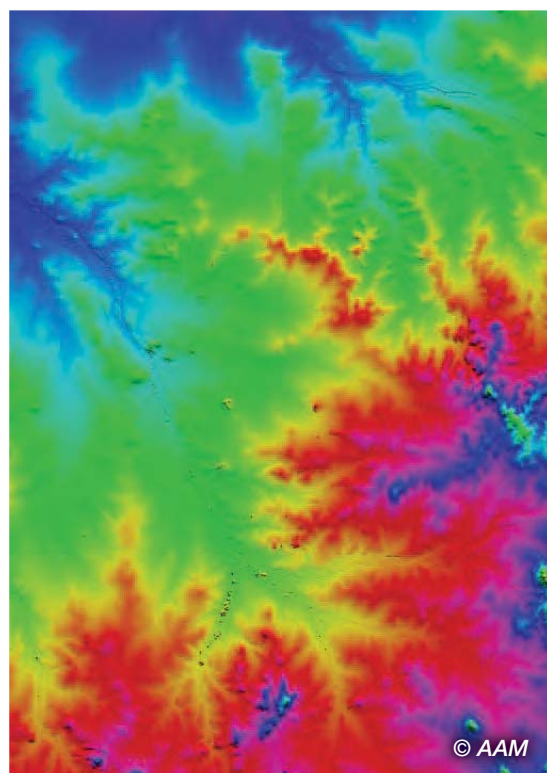
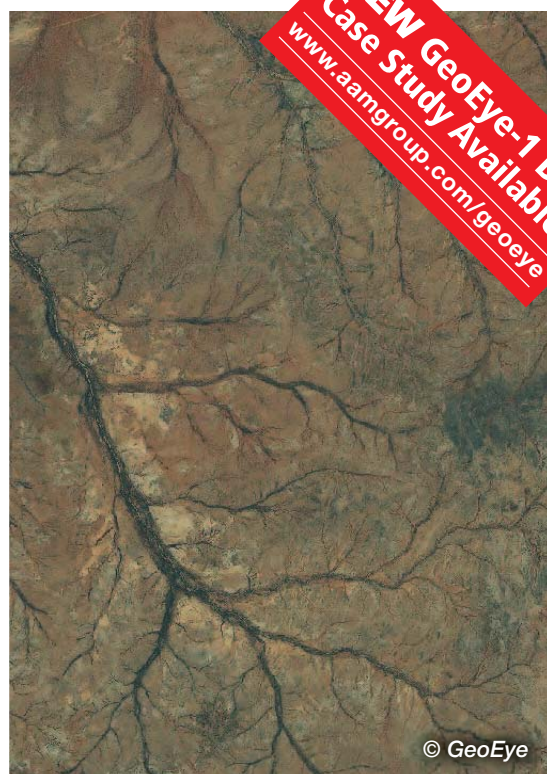
Horizontal Y – RMS 0.51m

### DEM

Horizontal X – RMS 0.33m

Horizontal Y – RMS 0.41m

Vertical Z – RMS 1.84m

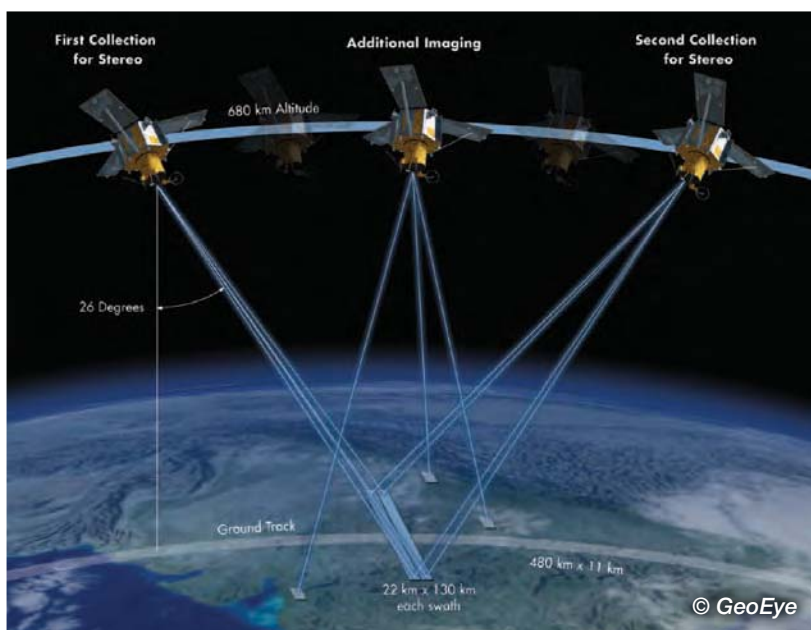


## Timeframes:

IKONOS Order Placed - 10 August

IKONOS Imagery Captured (Cloud free) - 25 August

Final Datasets Delivered - 12 September



Top: Final IKONOS orthoimage of WA

Above: Final IKONOS elevation model

Left: Representation of In-track IKONOS stereo collection. The IKONOS satellite orbits the earth at 680kms travelling at a speed of 7kms per second and is capable of capturing stereo imagery in the same overpass if requested.

# Imagery for All Applications

Take advantage of three great features of IKONOS and GeoEye-1 data:

1. Receive all four multispectral bands (Blue, Green, Red, Near IR) of data for the same price as three bands
2. Receive both panchromatic and multispectral for the same price
3. Receive two file formats for the price of one format eg. 3 or 4 band GeoTIFF, 3 band ecw , 3 band jpg



Above: GeoEye-1 image (0.5m resolution) over a village, Ivory Coast.



Above: GeoEye-1 image (0.5m resolution) over Cape Town, South Africa.