

COLLECTION CAPACITY & FLEXIBILITY OF A HIGH RESOLUTION SATELLITE (IKONOS): CUSTOMER BENEFITS OF LOCAL TASKING, DOWNLINK & PROCESSING

George Ellis

European Space Imaging GmbH, Germany

This report provides an overview of the collection capacity and flexibility of a high resolution satellite (IKONOS) using local satellite tasking, data downlink and processing, as well as the resulting benefits for customers with practical applications and typical projects.

The year 1999 shifted the premises of remote sensing and gave way for new survey opportunities and commercial applications when Space Imaging, based in Thornton, Colorado, U.S., launched their satellite IKONOS. For the first time ever digitally acquired and processed imagery with a spatial ground cell size of one meter and below became commercially available.

Local Tasking: European Space Imaging (EUSI) is the pre-eminent supplier of high quality, high-resolution, global IKONOS satellite imagery and derived information products to customers in Europe, Russia, CIS countries, and North Africa. EUSI operates its own local satellite ground station, and through direct local tasking of IKONOS has the fastest satellite programming and high-resolution image delivery capability currently available.

Resolution, Precision, Products: European Space Imaging's IKONOS satellite imagery product line with a ground resolution of just 82 centimetres and positional accuracy of 90 centimetres horizontally supplies the most detailed and accurate colour satellite imagery data available to commercial users. Products range from high quality colour and black-and-white imagery to complex three-dimensional digital terrain models and stereo images

Collection Capacity: IKONOS can collect data in excess of 2,000 km² per minute. Contiguous areas of up to 10000 km² of data in pan plus fully co-registered multi-spectral bands can be acquired on each single satellite pass, assuring timely acquisition and delivery of very accurate high-resolution satellite imagery over large areas.

Multi Spectral Characteristics: The IKONOS sensor layout is designed to acquire the portion of visible and infrared spectrum very similar to that recorded by Landsat TM/ETM. IKONOS imagery could be seen as a kind of "magnifier", enlarging objects at the ground by about 900 times compared to Landsat TM.

Data Depth: A 11 bit radiometric range is offered by IKONOS imagery, leading to typical radiometric fingerprints for almost each feature and usable data also in shadow areas.

Stereo Capabilities: Imagery recorded with different viewing angles provides 1 pass stereo capabilities.

Revisit Rate: Through its 700 km high orbit in combination with its off-nadir pointing capability in any direction IKONOS provides a very fast revisit rate. Tilting the satellite up to 50° increases the revisit rate of the sensor up to every third day for equatorial locations, every second day for mid-latitudes and daily for high latitudes. The sensor has shown the benefits of fast revisit cycles with the close to real time documentation of natural hazards, like the tsunami flooding, recorded short after the wave hits parts of Indonesia in 2004. Fast IKONOS revisit cycles together with local tasking abilities also enables EUSI to successfully complete Agricultural Monitoring for the European Commission since 2003 with very demanding cloud cover requirements and time lines.

Delivery: EUSI's online delivery is state-of-the-art in the remote sensing business. This service is particularly useful for organizations working in disaster management, national and regional security, as well as precision farming. Coupled with IKONOS' high collection capacity this is a service that no other high resolution satellite provider can match.

With Space Imaging Middle East (SIME) as its sister company, European Space Imaging is in a unique position to offer a single channel to IKONOS images and products. New imagery as well as archive data from both reception cones are instantly available through the office in Munich.