GeoWORLD CASE STUDY:

Pixxures and the City of Chicago

Overview:

The City of Chicago utilizes aerial imagery to supplement its geospatial database to track building footprints, support change detection, and for planning and asset management. The year 2005 marked the first time the city opted to use direct digital sensor technology over traditional film, and selected Pixxures to capture and process the color imagery at 6-inch resolution. "The post processing is much shorter than film," said Molly Mangan, Deputy CIO of the City of Chicago. "The ability to do infrared and not buy it, but have the option to get it later without an additional flight was appealing."

The City of Chicago and the surrounding aviation boundary chosen for the project consists of 441.45 square miles and includes some of the busiest airports in the world and many of the tallest cultural features found anywhere in the United States.

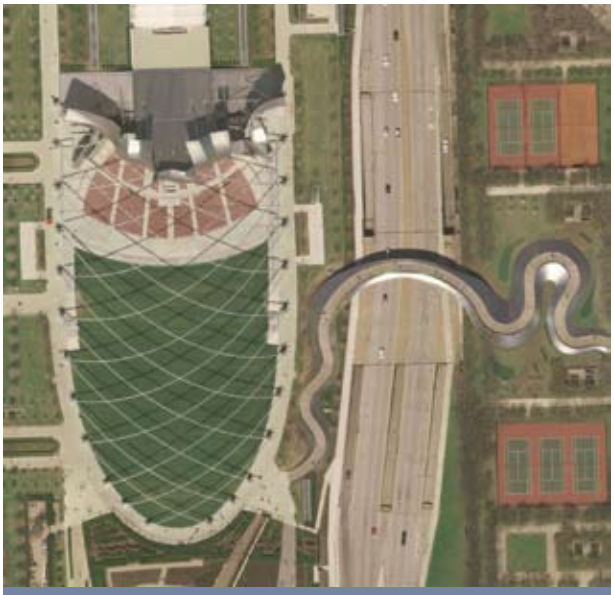
Challenge:

Historically, the height of the buildings created problems with the quality of data the city needed to achieve its goals. Tremendous building lean and shadowing caused obscured features, leaving many critical areas void of data. Minimizing building lean and shadows, as well as leveraging the city's existing investment in its current mapping data (DTMs and orthos) was key to the success of this project. The city opted for higher-resolution imagery, selecting 6-inch in lieu of 1-foot as previously done. This, along with the increased radiometry of the direct digital camera, dramatically increased the level of detail visible in the imagery.

Solution:

Pixxures' solution included using a direct digital process that would deliver the level of quality needed within the city's time frame. With its patented ortho-update technology, Pixxures leveraged the City of Chicago and Cook County's existing Digital Terrain Model (DTM) data to reduce the overall cost and expedite the turnaround time. The capture of imagery, along with ABGPS/IMU and supplemental ground control, will support DTM updates where required. The AOI covered part of DuPage County and required compilation of a new DTM by Pixxures. The multi-spectral capability of Pixxures' technology offers the City of Chicago the option to take receipt of the near infrared (NIR) band to support environmental needs.

Pixxures designed a specific flight plan that leveraged the advantages of the digital line scanner technology to facilitate a cost savings for Chicago, while providing the city with the most advanced data set of the downtown metropolitan area to date. The 12-bit data capture bandwidth increased radiometric depth in the shadows of the



Jay Pritzker Pavilion — 6-inch resolution

tall buildings in the major metropolitan area of interest. Additionally, the nadir configuration of the RGB bands on the focal plate captured a near true ortho perspective of the tall buildings, thus minimizing the angles of incidence in the metropolitan areas. Eighty percent overlap flight patterns in the metropolitan area coupled with a LiDAR DTM data set, facilitated correction of building lean and other elevated features.

The net result is an extremely accurate, high-resolution data set of America's third largest city. Increased resolution and greater image quality offer more valuable data to the City of Chicago.

Pixxures is currently working on the city's 2006 update. The aerial imagery was captured in April and is scheduled for completion in July. "We've never had the same specs twice until this year and we should be able to do a lot more analysis with the imagery," said Mangan. "We are very happy with the quality of the 2005 aerials. They are the sharpest aerials we've ever had."

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