United States Department of Agriculture
Natural Resources Conservation Service

USDA NRCS

Stereo and Image Derived DSM

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Additional Data Options for NAIP

As allowed for under our contract to the APFO, Surdex is offering the following value-added data sets:

1. A statewide, seamless set of 4-band tiles at 1-meter resolution suitable for web hosting.
2. Color Infrared (CIR) Compressed County Mosaics (CCMs).
3. Stereo pairs consisting of raw images coupled with aerotriangulation data suitable for stereoscopic mapping.

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Stereopair Product Specifications

This value-added deliverable consists of the imagery and the aerotriangulation data. This is becoming a popular value-added product for state and federal agencies wishing to update geospatial data.

1. Included is a shapefile identifying each exposure, date of capture, etc.
2. Imagery is in TIFF format and available in
   - Color
   - CIR
   - 4-band 8 bits per pixel format with internal pyramids
3. Most common stereoscopic exploitation packages are supported.

Pricing

Surdex – Minimum cost per contiguous block = $3,500

State	Square Miles	Approximate Seamless Data Set Size (Uncompressed)	Seamless Data	CIR CCMs	Stereopair Data
Illinois	59,028	600 GB	$22,000	$9,000	$25,000
Indiana	38,478	400 GB	$18,000	$8,000	$25,000
Mississippi	50,776	500 GB	$20,000	$9,000	$25,000
Missouri	73,386	725 GB	$25,000	$10,000	$30,000
North Carolina	54,397	550 GB	$22,000	$9,000	$25,000
Tennessee	45,364	450 GB	$20,000	$9,000	$25,000
Virginia	44,886	400 GB	$20,000	$9,000	$25,000

ASI – Any order, whether 1 county or 100, would have an initial cost of $600 and then $150/county on top of that. So, if you ordered the whole state of Iowa, with 99 counties, it would be $600 + (99 X $150) = $15,450

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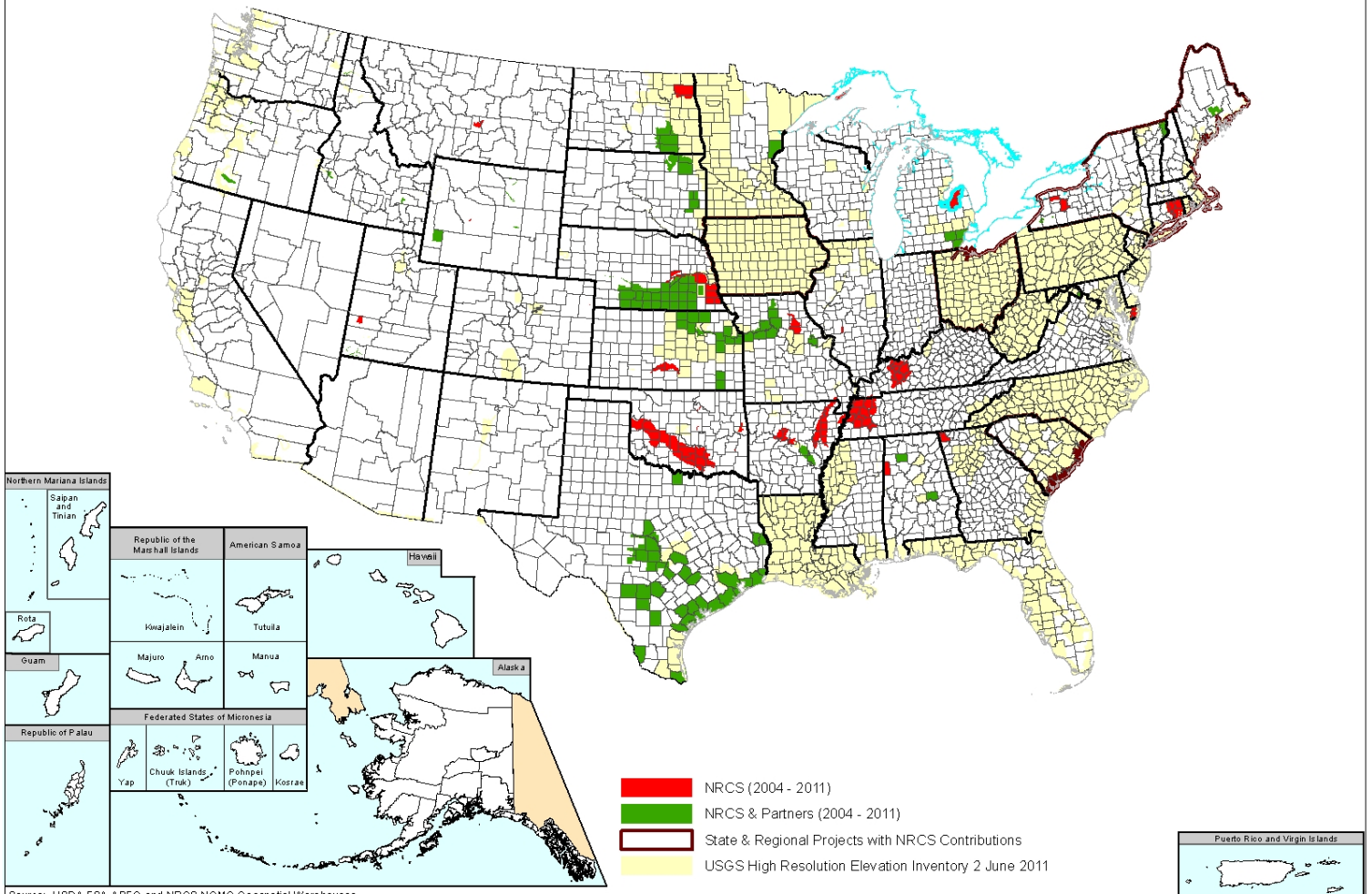
NRCS LIDAR PROJECTS



Source: USDA FSA-APFO and NRCS NGMC Geospatial Warehouses
DOI USGS EROS Center for LiDAR Information Coordination and Knowledge

February 8, 2012

USDA NRCS National Geospatial Management Center, Fort Worth, Texas 2012.

Semi Global Matching

- Limited to daylight
- Surface only
- Points can be assigned color values of the source image
- Potential higher density of points
- A derived product that does not add cost to a flight
- Larger computation cost

LiDAR

- Active sensor (day or night)
- Measures ground directly
- Intensity information can be displayed as an orthoimage
- Greater accuracy in height and horizontal position
- Generally higher acquisition time and cost

http://www.isprs.org/proceedings/XXXVIII/part1/11/11_01_Paper_121.pdf

Comparisons

	LiDAR	SGM
Horizontal Accuracy	10-30 cm (altitude-dep.)	0.5 GSD
Vertical Accuracy	5 cm	1.5 GSD
Typical High Resolution	30 cm	5 cm
Surface Measured	top and ground	top
Processing Time	1,000,000 points/s	10,000-20,000 point/s

Table 1. Comparison between LiDAR and SGM.

http://www.isprs.org/proceedings/XXXVIII/part1/11/11_01_Paper_121.pdf

Comparisons

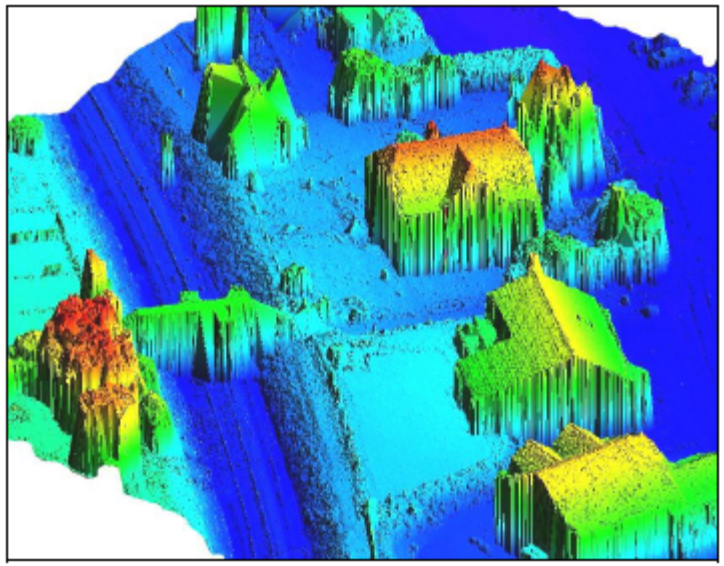


Figure 4. Detail of the SGM DSM in a perspective view.

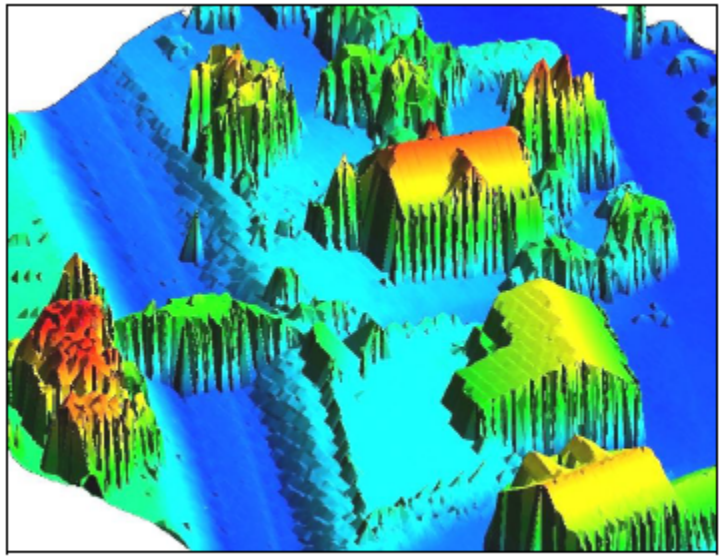


Figure 5. Detail of the LiDAR DSM in a perspective view.

http://www.isprs.org/proceedings/XXXVIII/part1/11/11_01_Paper_121.pdf

ISAE-Extended SGM Point Cloud

http://geospatial.intergraph.com/archive/webinars/2012-11-06-09.01-Photogrammetry-Advancements-for-2013_x264.mp4

DSM Options

- Deliverable – from NAIP vendor
- ERDAS enhanced Automated Terrain Extraction (eATE)
- ImageStation Automatic Elevations Extended (ISAE-Ext)

NRCS Testing

- ASI provided ADS-80 sample data set for Tama Co., IA
- Explore ERDAS Stereo Analyst
- Test ERDAS eATE

Findings

- Problems creating block file
- CPU intensive
- Preliminary results correlate well with LiDAR data