18 May, 2011

RE: Additional Data Options for the 2011 NAIP

Background

Surdex has been selected by the USDA Aerial Photography Field Office (APFO) with acquiring and processing imagery for the 2011 National Agriculture Imagery Program (NAIP) for the states of Oregon and Montana. These state project areas, as contracted to the APFO, involve 1-meter resolution digital natural color products.

Surdex will acquire all imagery at 1-meter resolution or better using our three Z/I Imaging Digital Mapping Cameras (DMC) hosted in our Cessna 441 (Conquest) aircraft, operating typically at ~34,000' (MSL). These large-format frame cameras simultaneously acquire panchromatic, color (R,G,B), and near infrared (NIR) images. After processing, the images are fused to provide 12 bits/pixel color images in 4-band (R,G,B,NIR). Later in the production phase, these images are converted to 8 bits/pixel abiding by imagery metrics defined by the NAIP product specifications.

As allowed for under our contract to the APFO, Surdex is offering a seamless data set of 4-band tiles at 1-meter resolution. This seamless data set is organized into 8Kx8K pixel tiles which extend slightly beyond the required bounds of the overlapping DOQQs. During the final stages of production for NAIP, the seamless data is used to extract the DOQQs for final formatting and delivery. The seamless data set is optimal for web-hosting of data, requiring ~20-30% less storage than the overlapping DOQQs. Each tile is in GeoTIFF format with embedded image "pyramids" honored by nearly all common GIS and web services software. The pyramids accelerate display and can be directly ingested into products such as the ESRI ImageServer with virtually no pre-processing.

Value-Added Product Specifications

All imagery is acquired and processed according to NAIP specifications. Though too detailed and lengthy to fully address here, a summary is provided below:

1. Image acquisition:
    a. Full digital acquisition with 4-band cameras.
    b. Imagery acquired in the season windows defined for specific areas in each state.
    c. No more than 10% cloud/cloud shadow in any DOQQ.
    d. Acquisition resolution of 1.05-meter or better.
    e. Full stereoscopic acquisition. Surdex acquires at 60% forward lap and 30% sidelap.
    f. Imagery acquired to buffer required DOQQ coverage by at least 300 meters.
2. Orthophotos produced to an accuracy of 95% of all points within 6 meters of true position.
    a. Historically, validated to approximately ±3.0 meters (CE 95).
    b. Less than 3 pixels shear across any linear feature.
3. Image quality
    a. Abiding by metrics established by the program for the natural color bands (R,G,B)
    b. No definitive specifications exist for the NIR band. Surdex processes this band to optimize the dynamic range of the NIR band to provide maximum information content.
    c. Seamless radiometric appearance.

4. A statewide "seamline" shape file is provided that delineates, to pixel resolution, the seaming of the individual digital orthophotos. Attribution for each polygon includes:
    a. Date of capture within each polygon.
    b. Sensor make/model
    c. Area of polygon.

The value-added deliverable product includes the additional specifications:

1. A seamless data set using 8,192 x 8,192 pixel tiles at 1-meter resolution.
    a. Tiles extend ~300 meters beyond the buffered DOQQs
    b. Some tiles may be partially filled
    c. In a single UTM zone chosen to be the zone covering the largest portion of the state.
2. 4-band x 8 bits/pixel
3. GeoTIFF format tiles
    a. Fully attributed geocoding (projection, resolution, etc.).
    b. 128x128 pixel tiles.
    c. Embedded image pyramids.

Preliminary shape files for the seamless tile layout are provided as an addendum to this document.

Clients desiring the seamless data set in other than the prescribed UTM projection for each state can obtain this for a moderate additional price. The desired projection must be describable in an ESRI projection file (".prj") format. Additionally, if the projection is not supported in the standard GeoTIF projection list, TIFF/TFW files will have to delivered in lieu of GeoTIFF.

Warranty

This data is provided "as is" and corrections to the data will be made at the discretion of Surdex. However, the data set will be updated if corrections are required by the USDA during final inspection. These corrections would be made available later in 2012, depending upon the inspection schedule of the USDA.

Delivery Timeframe

Under our contract with the APFO, Surdex is precluded from delivering value-added data until all obligations for all state projects assigned to us in 2011 are satisfied. Based on current delivery schedules defined for the 2011 NAIP, we anticipate being able to ship the seamless data in the October/November timeframe.

Data Rights

Clients will be granted restricted rights to this data, with Surdex holding full rights in data. Clients can freely distribute the data and host it on web sites. Clients are only prevented from re-selling this data, alterations of this data, or derivatives of this data.

Follow Up

Please feel free to contact me directly, or our Pacific Northwest Business Partner (Mike McGuire of Ascent GIS), at any time to discuss the provided information.

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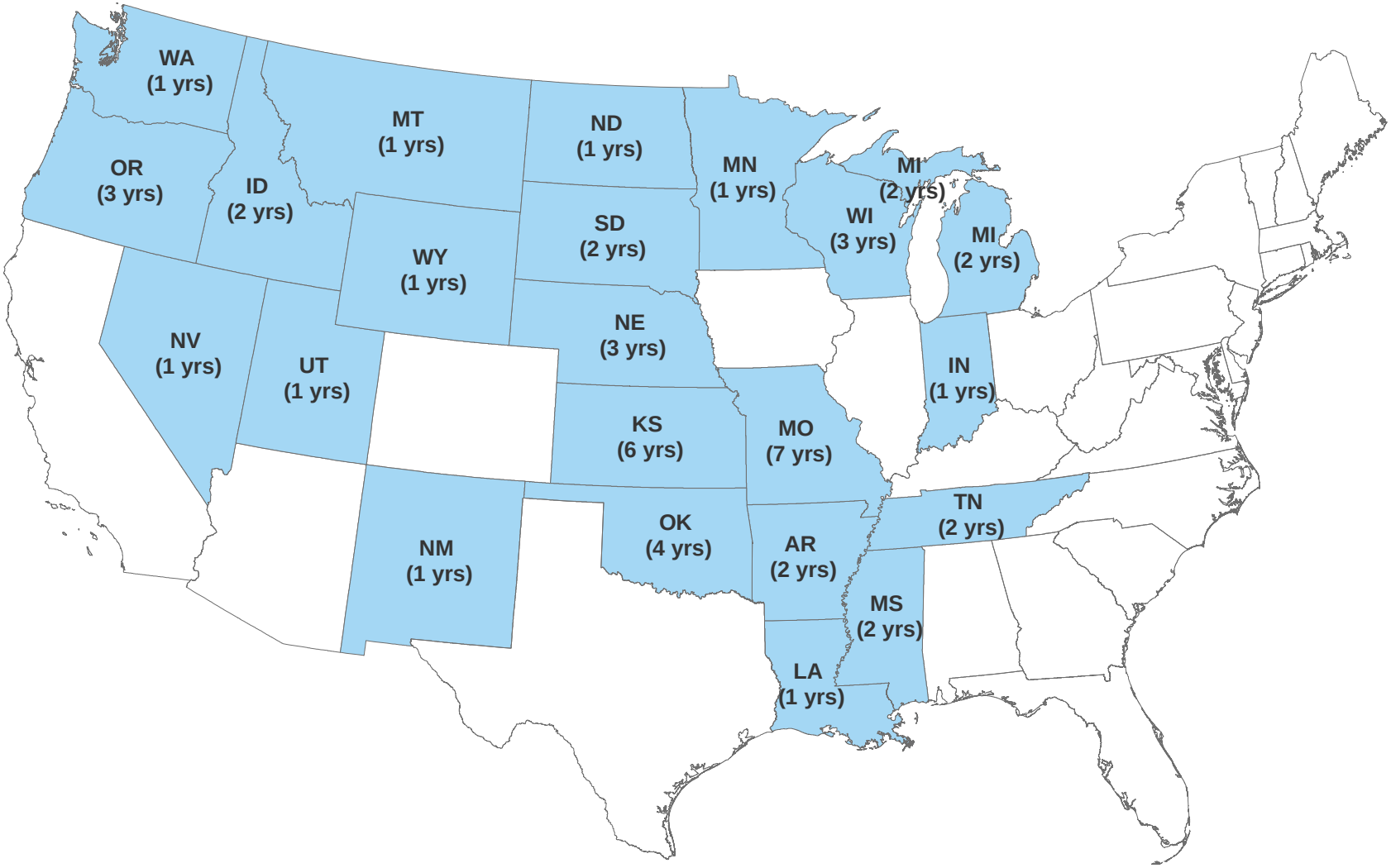
Surdex's NAIP History

State	2003	2004	2005	2006	2007	2008	2009	2010	2011	Years of Experience
MO	5,043	5,043	5,043	5,020	5,012		5,018	5,018		7
KS	5,693	5,693	5,693	6,260		5,902		5,902		6
OK	4,945	4,803	4,716					4,815		4
NE		5,873	5,783	5,754						3
WI		2,259	4,475			4,503				3
SD			6,045	6,043						2
OR			7,440	4,140					7,466	2
TN					3,005	3,001				2
ID				3,112			6,553			2
MI							4,844	4,844		2
AR				3,561				3,600		2
MS				3,179				3,237		2
ND				5,690						1
WA				5,762						1
IN		1,084								1
LA					3,253					1
MN						6,765				1
NM							8,028			1
UT							5,992			1
WY							7,356			1
NV								7,454		1
MT									11,766	
States	3	6	7	10	3	4	6	7	2	48
DOQQs	15,681	24,755	39,285	48,521	11,270	20,171	37,791	34,870	19,242	251,586
Rank	1	2	2	1	1	2	2	1	2	
Contractors	9	10	10	10	6	6	6	6	6	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