



National Agriculture Imagery Program (NAIP)

INFORMATION SHEET

August 2013

What is the National Agriculture Imagery Program (NAIP)?

NAIP is a program to acquire “leaf on” aerial imagery during the peak growing season, and deliver this imagery to USDA County Service Centers, to maintain the common land unit (CLU) boundaries and assist with farm programs. The goal of NAIP is to collect 1-meter imagery for the entire conterminous United States. The imagery is acquired as a four-band product, which can be viewed as either a natural color or color infrared image.

While the focus of NAIP is on agricultural areas, FSA funds and cost share partnerships between federal agencies are leveraged to acquire full state coverage.

Who acquires the imagery?

Independent contractors acquire the NAIP imagery. The current NAIP contract cycle has 3 primary contractors flying imagery for the USDA Farm Service Agency (FSA).

Contractors are selected via “best value” criteria. Contract proposals are evaluated on past performance, ability and capacity to perform the work, and cost. Secondary contracts between NAIP cost share partners and NAIP vendors are allowed, subject to FSA approval.

A downloadable PDF of the contract can be found on the APFO website (<http://www.apfo.usda.gov>), under the Contract Services subject, Business Opportunities topic.

How is the imagery acquired?

When the NAIP program began, imagery was acquired from aircraft using film or digital cameras; at present, acquisition is entirely with digital sensors. Both film and digital cameras must meet rigid calibration specifications. The digital sensors currently in use may acquire imagery through a continuous collection technology, or may use set “exposures,” similar to film based acquisition.

Aircraft...what about satellites?

Commercial satellite imagery may also be used in NAIP contracts, although as of 2013 it has not been used. In 2004, the contract specified a spatial resolution of 1 meter or higher in all color bands. In 2005, the requirement was changed to allow pan-sharpening of color bands in satellite or aircraft acquired NAIP imagery.

What is the spectral resolution of the imagery?

The default is four-band imagery, containing red, green, blue, and near-infrared bands. Either natural color or color infrared imagery (CIR) can be displayed by changing the band assignments in the viewing software.

What spatial resolution is the imagery?

NAIP imagery has a 1-meter ground sample distance (GSD). Beginning with the 2011 NAIP season, ½-meter GSD imagery is an option through a contract “buy up” if the additional funding for the higher cost of the imagery is available from state or federal partners. The 2013 NAIP imagery for Idaho is the first and only state to have received half meter imagery. In earlier years of NAIP, some states were flown at a 2-meter GSD for compliance uses.

What is reference ortho imagery?

Until 2006, the horizontal accuracy of all NAIP imagery was inspected by comparing the NAIP imagery to existing orthorectified imagery, the mosaicked digital ortho quarter quads (MDOQ), which were initially used to digitize FSA common land unit (CLU) data. The NAIP imagery was required to match within 5-meters to the existing MDOQs.

Beginning in 2006, ground control points were used for inspecting some of the NAIP imagery. During this time, existing imagery was also used for inspecting the majority of the NAIP imagery.

What is the absolute accuracy specification?

NAIP transitioned to an absolute accuracy specification beginning in 2006, which tied the imagery to true ground rather than another imagery source. The contract states that “all well-defined points tested shall fall within 6 meters of true ground at a 95% confidence level”.

From 2006 – 2008, nine states were selected to meet the absolute accuracy specification: Utah in 2006, Arizona in 2007, and Indiana, Minnesota, New Hampshire, North Carolina, Texas, Vermont, and Virginia in 2008. Beginning in 2009, all states flown adhered to this specification.

Is the imagery reviewed to make sure it is accurate?

APFO has stringent imagery compliance guidelines, and all deliverables are inspected using automated and visual methods to ensure accuracy and compliance with the contract.

How long has NAIP been in existence?

NAIP pilot projects began in 2002. The program has continued to grow ever since.

The NAIP acquisition schedule avoids concentrating states lying in areas where weather conditions make acquisition difficult.

Much of the funding for the program is provided by other federal, state, and regional governments. Partnering on an endeavor such as NAIP is important because it reduces duplication of effort and fiscal waste.

In what formats can I receive the imagery?

Imagery comes in two main formats:

1. Compressed County Mosaic (CCM)
 - a. Mosaics are generated by compressing digital ortho quarter quads (DOQQs) into a single mosaic.
 - b. Compression for 2005 – 2013 Natural Color NAIP is MrSID MG3 at a ratio of 15:1 for 1-meter and 60:1 for ½-meter.
 - c. Compression for 2004 NAIP and earlier was MrSID MG2 at a ratio of 50:1 or 20:1 for 1m or 2m resolution imagery respectively.
 - d. In 2008, 4-band NAIP imagery was compressed with JPEG 2000. JPEG 2000 is currently not used for NAIP.
 - e. The mosaic may cover all or portions of an individual county or project area.
2. Digital Ortho Quarter Quad (DOQQ).
 - a. Each individual image tile (DOQQ) within the mosaic covers a 3.75 x 3.75 minute quarter quadrangle plus a 300 meter buffer on all four sides.
 - b. The DOQQs are available in GeoTIFF format, and all individual DOQQs and resulting mosaics are rectified to the specified UTM coordinate system zone.
 - c. DOQQs can be purchased through the APFO Customer Service Section. For detailed information on NAIP availability, please see the [Interactive NAIP Status map](#) on the [APFO website](#) or contact the Customer Service Section at 801-844-2922, or by email at apfo.sales@slc.usda.gov

How can I get NAIP imagery?

1. Compressed County Mosaics (CCMs) are available 45 days or less after the end of the state flying season. The natural color CCMs are available to the general public through the [USDA Geospatial Data Gateway](#). All years of available imagery may be downloaded as ½, 1, or 2 meter CCMs depending on the original spatial resolution. Downloads are free. CCMs with a file size larger than 8 GB may not be downloaded from the Gateway; they can be obtained by contacting the [APFO Customer Service Section](#). Pricing and delivery methods can be found in the contact information listed below.
2. Full resolution quarter quads (DOQQs) are delivered to APFO within 30 days after the acquisition period ends. They will be available in a natural color format, through the public facing web service, after the entire state has been received at APFO. The four band DOQQs are available for purchase. Media options for delivery include hard copy photos, CD/DVD, and portable hard disc drives.

3. Orders for CCMs and DOQQs on media can be placed at the Aerial Photography Field Office (APFO) in person or on the [APFO website](#). Select *Find out more about the NAIP Imagery Program*, then [Ordering NAIP Imagery](#).
4. NAIP DOQQs can be added into a GIS project for viewing through APFO's ArcGIS service. Detailed instructions for using this web service can be found on the APFO website. Select Imagery Programs and then select [NAIP Imagery](#). Scroll down to the section titled "How can NAIP be accessed."

How much does NAIP imagery cost?

Costs vary greatly by product and volume. Contact the APFO Customer Service Section at apfo.sales@slc.usda.gov or at 801-844-2922 for detailed information.

What software is needed to view the imagery?

1. NAIP CCMs from 2005 – 2013 require software that reads the MG3 or JPEG 2000 format. Pre-2005 CCMs used the MG2 format. Four band imagery will require software which can recognize all four bands. A list of free viewing software is available at the [APFO website](#). Select *Get a viewer for my digital imagery*. This list is provided for convenience; USDA-FSA-APFO does not support or endorse these products or services.
2. Most image viewing software will display GeoTIFF files.

Who do I contact for more information?

1. Progress on the NAIP 2013 acquisition can be found on the [NAIP 2013 Status Map](#).
2. For sales information, contact USDA-FSA-APFO at 2222 W 2300 S, Salt Lake City UT, 84119-2020, call 801-844-2922, or visit the [APFO website](#).
3. For further information contact the NAIP Program Manager Kent Williams at 801-844-2908, or GIS Specialist David Davis at 801-844-2933.