



United States Department of Agriculture

National Agriculture Imagery Program (NAIP)

INFORMATION SHEET

October 2017

What is the National Agriculture Imagery Program (NAIP)?

NAIP is a USDA, Farm Service Agency (FSA) program to acquire “leaf on” aerial imagery during the peak growing season, and deliver this imagery to USDA County Service Centers. The NAIP imagery is used to maintain Common Land Unit (CLU) boundaries and assist with farm programs. The goal of NAIP is to collect 1-meter or better imagery for the entire conterminous United States. The imagery is acquired as a 4-band product, which can be viewed as either a natural color or color infrared image.

While the focus of NAIP is on agricultural areas, funds from FSA 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 contract has three primary contractors acquiring 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 with 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 2017 it has not been used. In 2004, the contract specified a spatial resolution of 1 meter or better in all color bands. In 2005, the requirement was changed to allow pan-sharpening of color bands in NAIP imagery acquired using satellites or aircraft.

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, ½-meter GSD imagery is an option through a contract “buy up”. The 2013 imagery for ID and 2015 imagery for WY and NY were delivered at 0.5-meter GSD. In 2016, 0.6-meter GSD imagery was acquired for: CA, CT, IN, KY, MA, MI, MO, MS, ND, NE, NH, RI, SD, & RI. In 2017, 0.6-meter GSD imagery was acquired for: AZ, MT, & ND. Imagery for the remainder of the states was delivered at 1-meter. From 2002 - 2007 imagery for some states was acquired 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.

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 stated that “all well-defined points tested shall fall within 6 meters of true ground at a 95% confidence level”. Beginning in 2016 the requirement was changed from 6-meters to 4-meters.

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. Products are inspected using automated and visual methods to ensure accuracy and compliance of the contract specifications.

How long has NAIP been in existence?

NAIP pilot projects began in 2002. [Click here for additional information about the 15+ years of NAIP.](#)

Each year several federal and/or state agencies contribute funds, which together with the FSA funds allow for greater acquisition of data. These NAIP funding partnerships reduce duplication of effort and fiscal waste, and enable more area to be flown and/or upgrades such as higher resolution. The NAIP acquisition schedule avoids grouping states in areas where weather conditions make acquisition difficult.

What are the formats of the imagery?

NAIP 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 – 2017 (except 2008) is MrSID MG3, Natural Color at a ratio of 15:1 for 1-meter and 60:1 for 0.5 and 0.6-meter imagery.
 - c. In 2008, 4-band NAIP imagery was compressed with JPEG 2000. For all other years of NAIP since 2005, 3-band, MG3 has been used.
 - d. Compression for 2004 NAIP and earlier was MrSID MG2 at a ratio of 50:1 for 1-m and 20:1 for 2-m resolution imagery.
 - e. The compressed county 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 and other items, please see the [NAIP Status maps](#) 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 0.5, 0.6, 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 digital ortho quarter quads (DOQQs) are delivered to APFO within 30 days after the acquisition period ends. The DOQQ imagery is also made available through a four band [public facing web service](#), after imagery for the entire state has been received at APFO. The four band DOQQs are available for purchase. Delivery options include: hard copy photos, CD/DVD, USB flash drive, portable hard disk drive, or electronic delivery (limited file size).

3. Orders for CCMs and DOQQs on media can be placed at the Aerial Photography Field Office (APFO) in person, by phone, or email. Additional information can be found on the [APFO website](#) under *Related Topics, Ordering Instructions*.
4. NAIP DOQQs can be viewed through APFO's image service. The imagery viewed in the image service experiences compression. Detailed instructions for using this web service can be found on the APFO website. Select *Support Documents, Information Sheets*, and then [Adding Public ArcGIS Service 10x](#).

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 801-844-2922 for detailed information.

What software is needed to view the imagery?

1. NAIP CCMs from 2005 – present 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 *Support Documents, Information Sheets, Data Viewers*. This list is provided for convenience; USDA-FSA-APFO does not support or endorse these products or services.
2. The NAIP DOQQs are in the GeoTIFF format. Most image viewing software will display this format.

Who do I contact for more information?

1. NAIP acquisition and other information can be found on the [NAIP Status Maps](#) site. National Geospatial Data Assets (NGDA) and other NAIP related links are also available at [Data.gov](#) and [Geoplatform.gov](#).
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 NAIP project manager Bridget Barlow 801-844-2911, or GIS specialists David Davis 801-844-2933 or Joan Biediger 801-844-2951.