

National Agriculture Imagery Program

Civil Commercial Imagery Evaluation Workshop

March 20-22, 2007

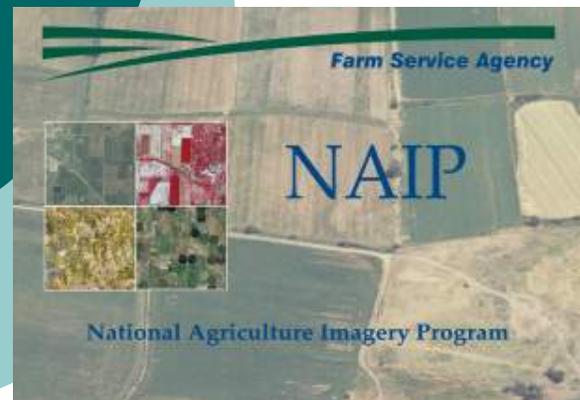
Fairfax, VA

Shirley Hall

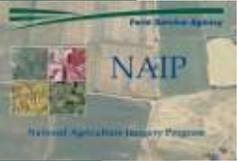
GIS Program Manager

USDA-Farm Service Agency

Shirley.Hall@wdc.usda.gov

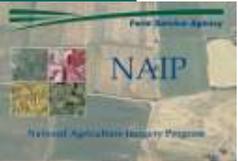


National Agriculture Imagery Program



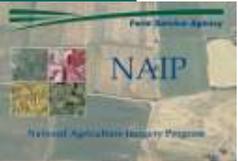
- About FSA...
- NAIP – Program and Products
- Partnership Opportunities
- NAIP and the *Imagery for the Nation* initiative

USDA – Farm Service Agency



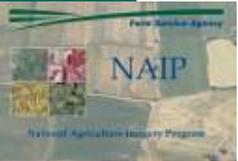
- FSA administers and manages farm commodity, credit, conservation, disaster and loan programs as laid out by Congress.
- FSA programs are designed to improve the economic stability of the agricultural industry and to help farmers adjust production to meet demand.
- Currently, there are 2,346 FSA county offices in the continental states that certify farmers for farm programs and pay out farm subsidies and disaster payments.

The Farm Service Agency, Ortho-Imagery and GIS

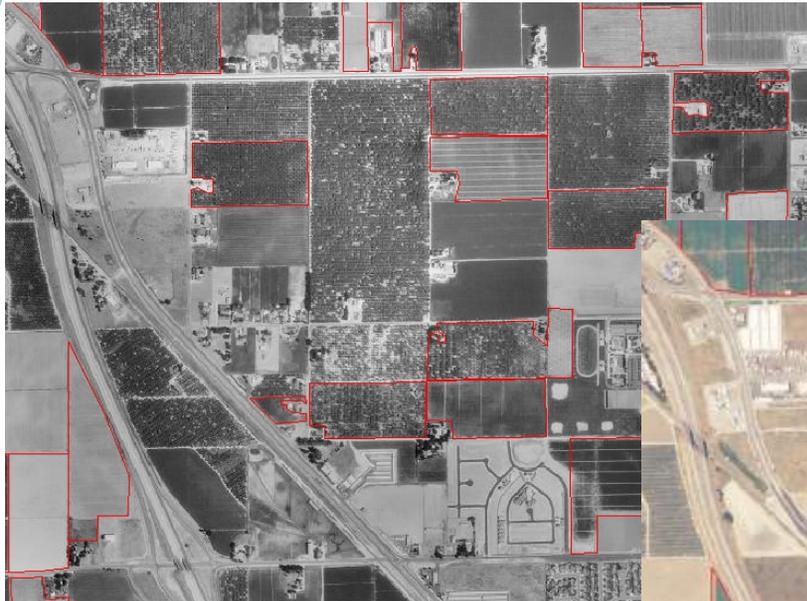


- Modernization effort that integrates GIS and farm program administration
- Digitized farm field boundaries called Common Land Units
- Base Ortho Imagery updated on a 3-5 year cycle
- Imagery that meets FSA program requirements – Ag. lands, annual/during growing season, natural color
- Program management, change detection, and program compliance

Ortho Image Base and CLU

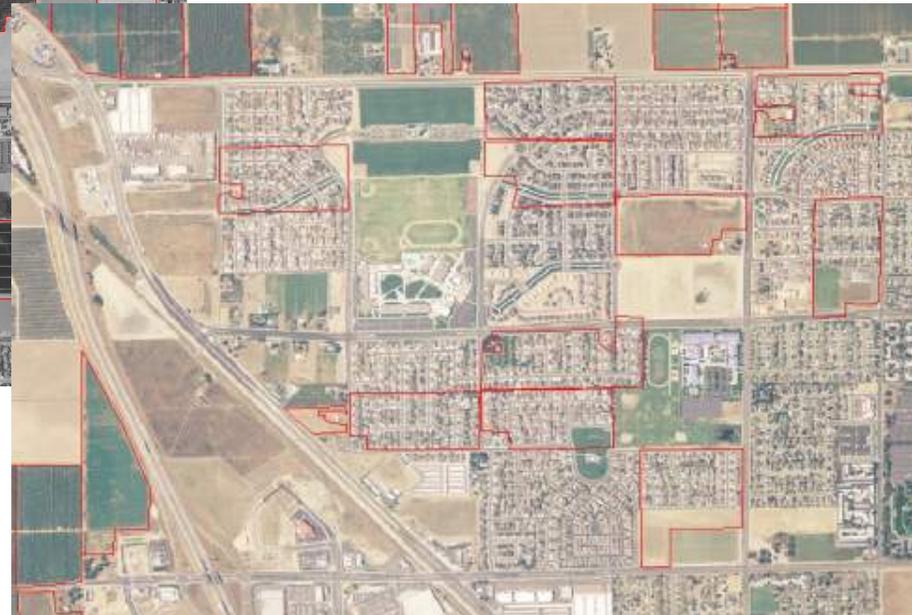


San Joaquin Valley, California



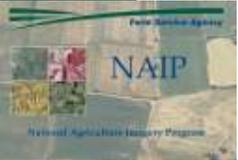
1998 DOQQ

2005 NAIP

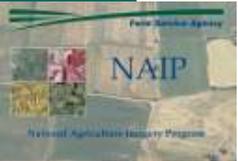


What is NAIP?

- **Strategy**
 - **Annual collection during growing season**
 - **1-meter imagery acquisition over roughly 20 percent** of the nation with partners to meet a 5 year base imagery replacement schedule
 - **2 - meter imagery over remaining agricultural lands** in lower 48 States for farm program use.
- **Innovative program management, technology integration and contract administration.**
- **Expedited product delivery process:** compressed county mosaics delivered 30 days after the flying season ends and DOQQs within the following year.



NAIP Contract



- Multi-year Indefinite Delivery, Indefinite Quantity (IDIQ) contract - new 5 year contract will be awarded in April 07
- Awarded to Multiple Contractors (2004 contract -10 contractors)
- Task Orders competed using “best value” procurement process
- Performance Based Contract
- Supports partner requirements
 - After contract arrangements for CIR, .5 meter or alternate projections

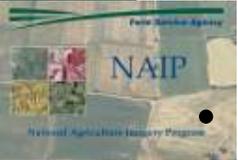
Best Value Procurement Process



Competitive source selection process which evaluates contractor proposals according to:

- Technical merit
- Project management capabilities
- Past performance and quality assessment
- Pricing and other criteria

Performance Based Contract



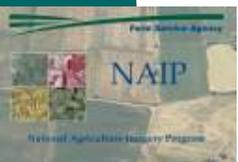
- Statement of work describes products and services to be provided by the contractor
- Defines required end products rather than a rigid “how to” set of specifications
- Allows innovative methods to produce the end product including film or digital options

NAIP Specifications



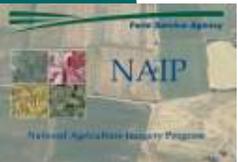
- Natural Color (RGB)
- Leaf On
- Horizontal Accuracy
 - 1 meter GSD -- 5 meters from DOQ base
 - 2 meter GSD -- 10 meters from DOQ base
- Best available elevation for ortho rectification - Mostly NED
- 10% cloud cover per quarter quad is acceptable
- UTM coordinate system

Acquisition Plan



- Projects are state based
 - 6 to 8 week flying season
 - Large states split into multiple flying seasons
- No reflights after flight season
- Re-processing where required
 - Based on initial QA
- Final payment reflects quarter quads that do not pass QA

NAIP Contract Aircraft



Up To 50 Aircraft utilized nationwide

High Performance Piston Singles



Light Piston Twins



Small Turboprops



Lear jets



Film Camera Equipment

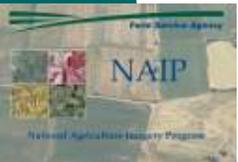
Precision Mapping Cameras

FAA Approved Camera Ports & Mounts

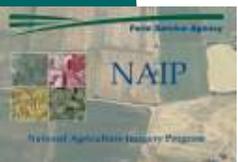
Holds 1 x 500 foot Film Rolls

Approximately 300 Pounds

\$250k – \$600k costs



Airborne Digital Sensor Systems



Large Format Precision Digital Cameras

Leica ADS40 System:
Multispectral CCD lines,
2 x 12,000 pixels

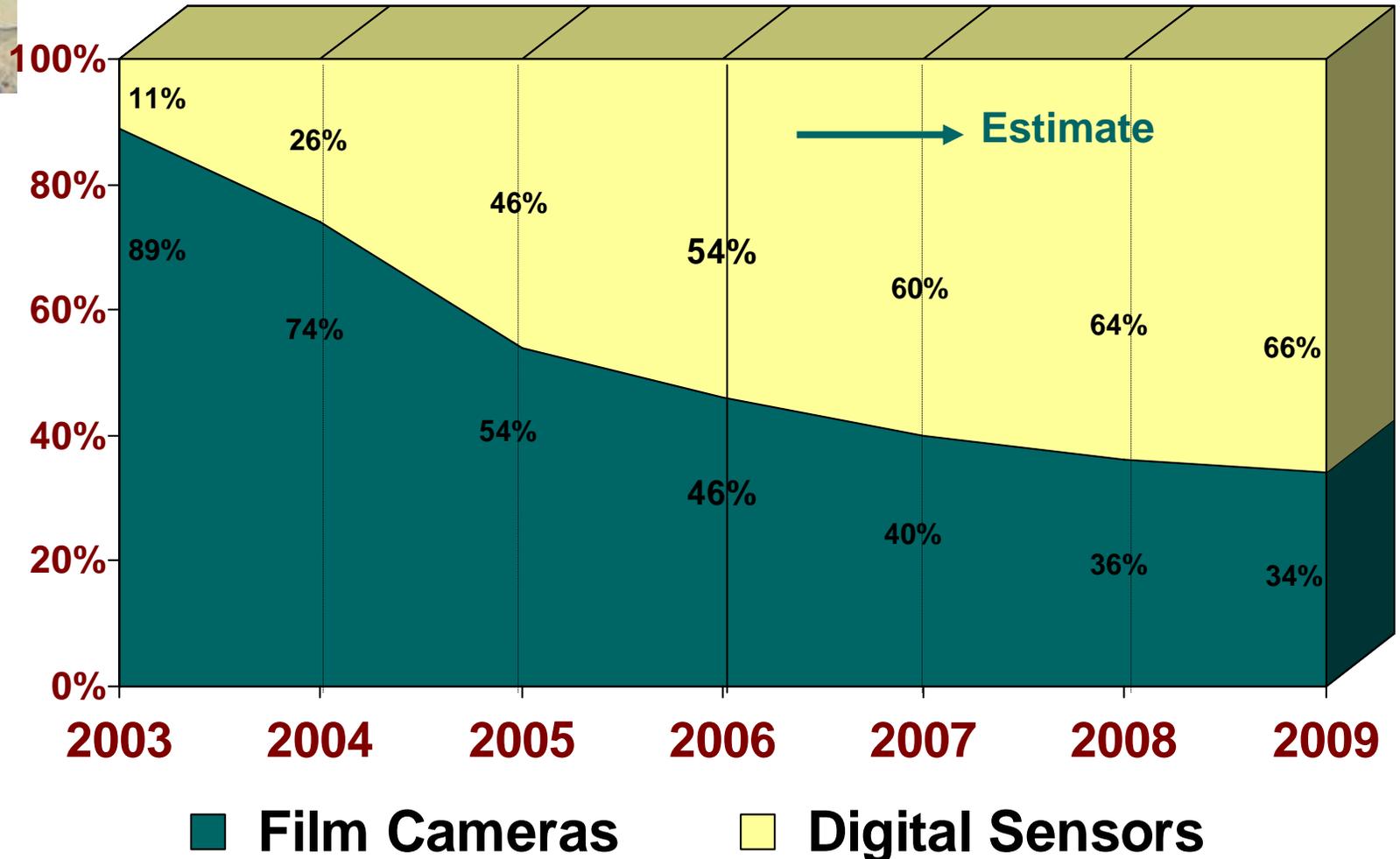
Vexcel UltraCam System:
Fixed digital
array camera

Z/I DMC System:
Fixed digital
array camera

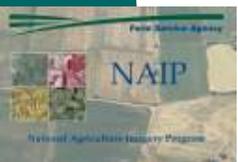


NAIP Camera Trends

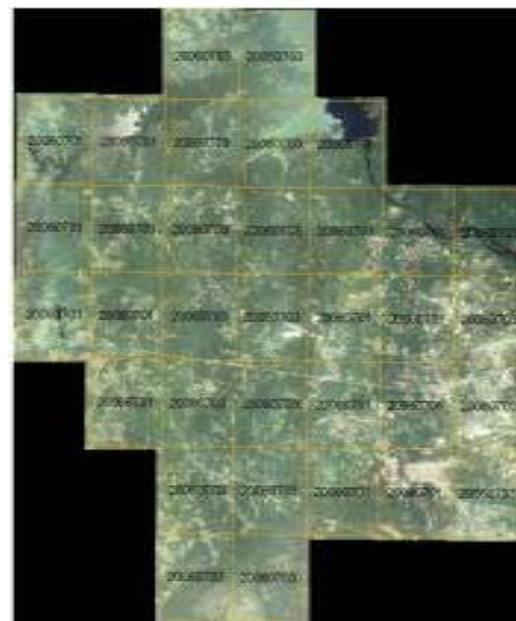
Film Cameras vs. Digital Sensors



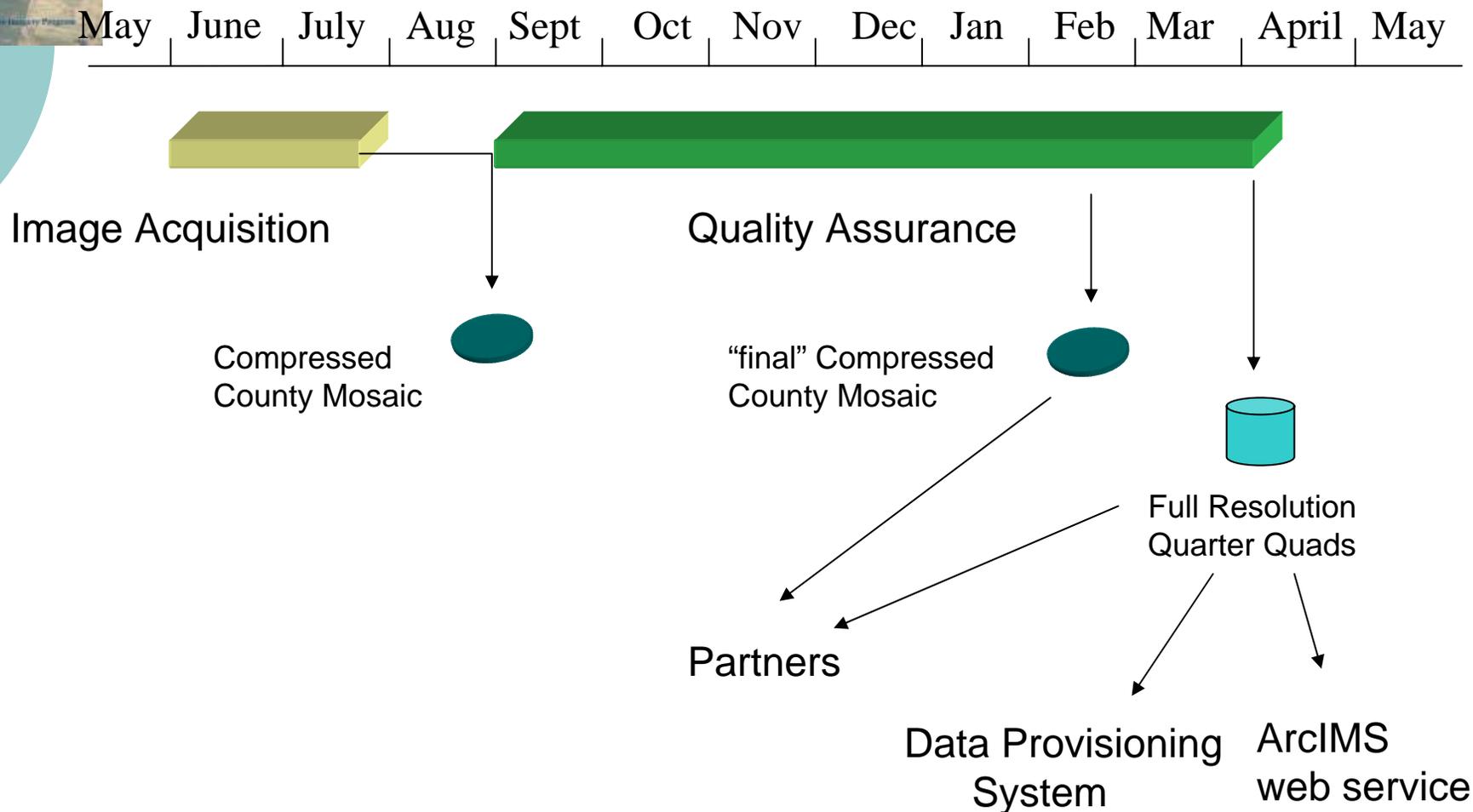
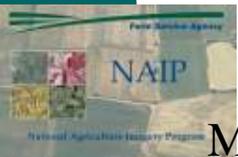
NAIP Products



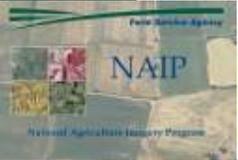
- Compressed County Mosaic (CCM)
 - MrSID MG3 format
 - 15:1 compression ratio
- Quarter Quads
 - GeoTIFF
 - Full resolution
- Metadata
 - FGDC compliant
 - Quarter quad shape file
 - Acquisition date



NAIP Delivery Timeline

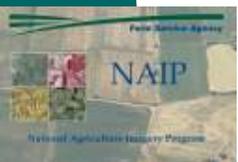


NAIP Distribution/Access



- Download Compressed County Mosaics
- Bulk Orders on portable disk drives
- Custom Provisioning/Delivery of Imagery
- Web Service (ArcIMS)
- Pre-position “best available” for 2006 Hurricane season
 - Gulf Coast and South Eastern and states on portable disk drives

NAIP Distribution/Access



Download Compressed County Mosaics

USDA Geospatial Data Gateway

- www.nrcs.itc.usda.gov
- No charge
- Download only
- High volume of downloads has led to problems
 - **40,000 mosaics in FY2006**

NAIP Distribution/Access



- Bulk Orders on Hard Disk Drives “as is”
 - CCMs for entire NAIP year /\$10,000
 - includes “interim versions”
 - no version management
- Partners
 - Receive all products
 - Get new versions

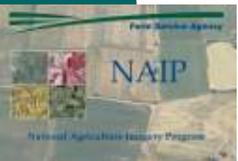
NAIP Distribution/Access



Custom Provisioning/Delivery of Imagery

- **Dedicated Data Center**
 - 40 TB on-line
 - Tape silo for historical Imagery
 - Latest 2 years NAIP
 - NAIP generations
 - Film based projects back to 1955
- **Data Provisioning System**
 - Web based data discovery and ordering system (account required)
 - User defined AOI
 - User defined formats
 - User defined image processing

NAIP Distribution/Access

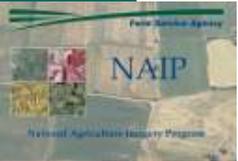
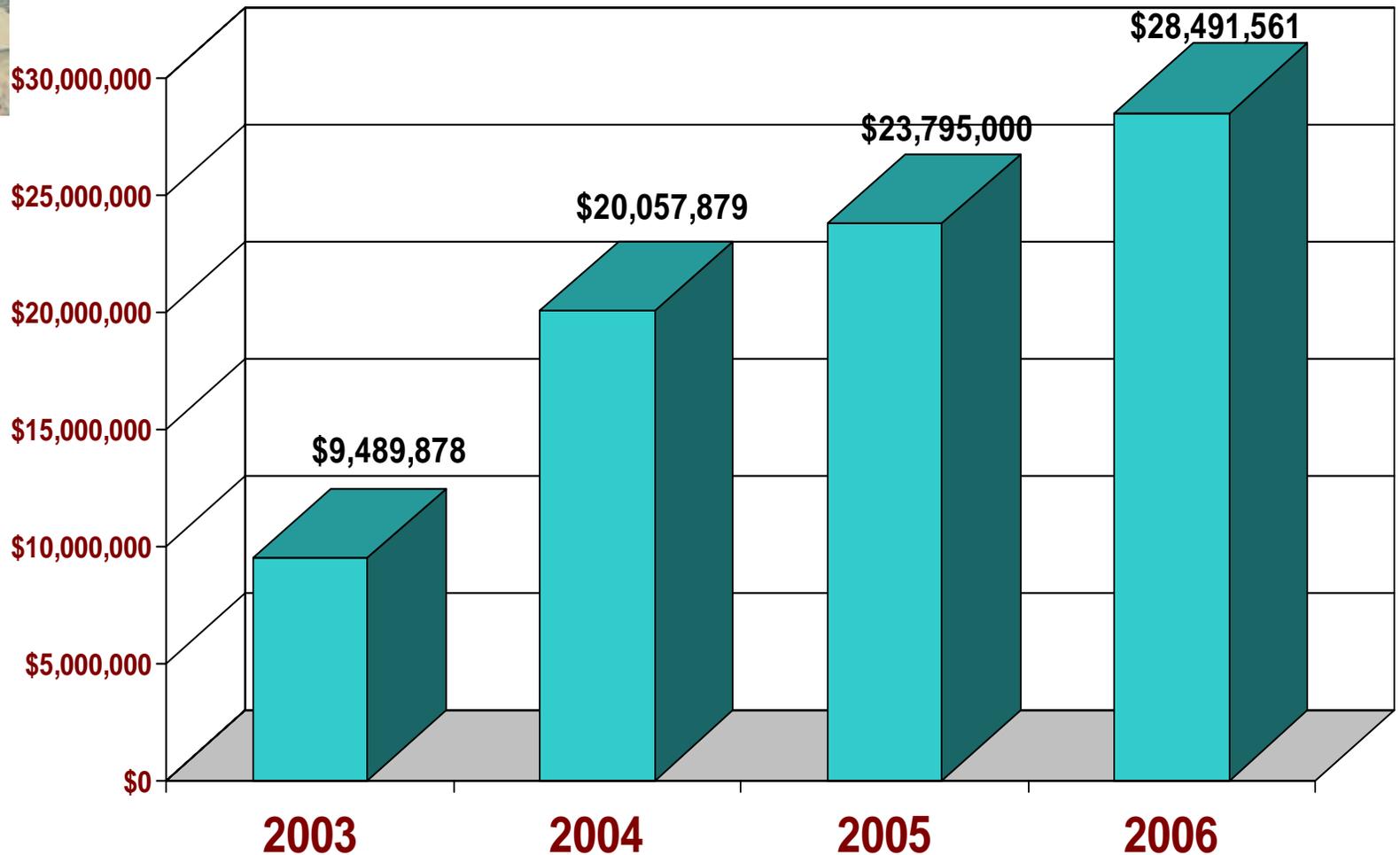


Web Service (ArcIMS)

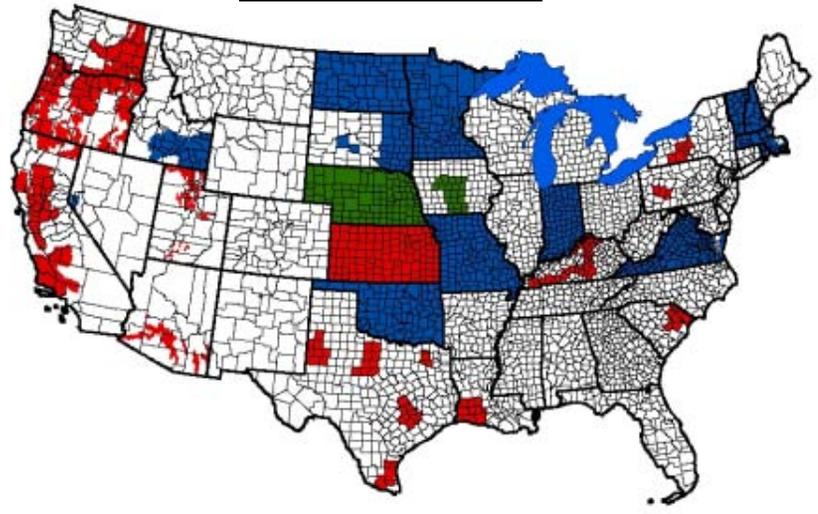
- Intended for dedicated service via USDA intranet
- www.gdw.apfo.usda.gov
- Partners
 - Account based access to WMS and ArcIMS is planned

NAIP Funding History

Contract Awards 2003 - 2006



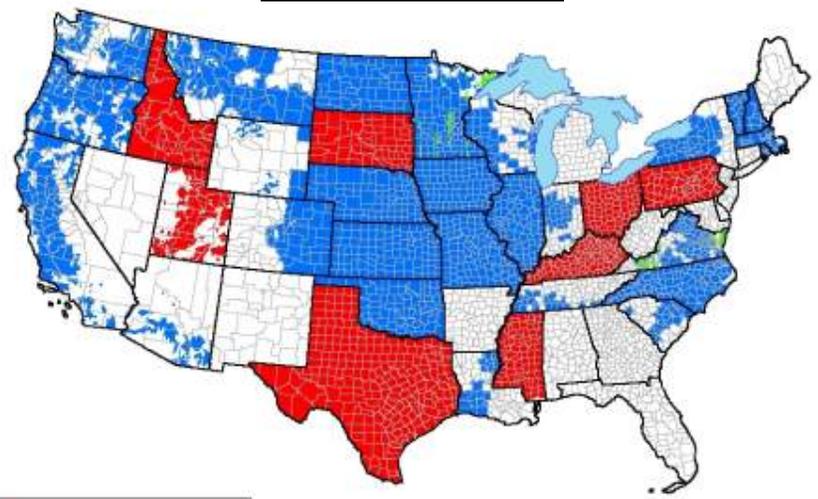
2003 NAIP



1,038 Counties



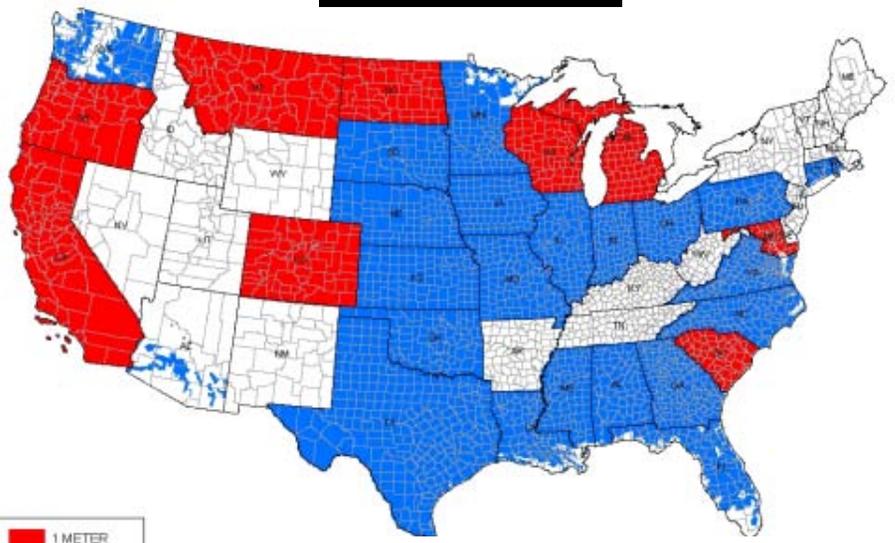
2004 NAIP



2,089 Counties

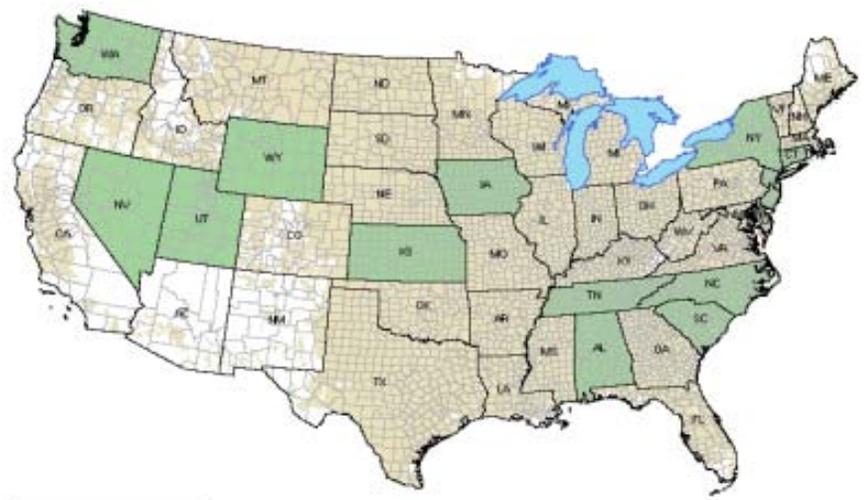
2005 NAIP

MAY 24, 2005



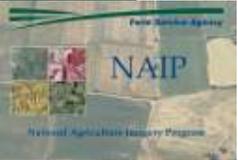
2,445 Counties

2006 NAIP



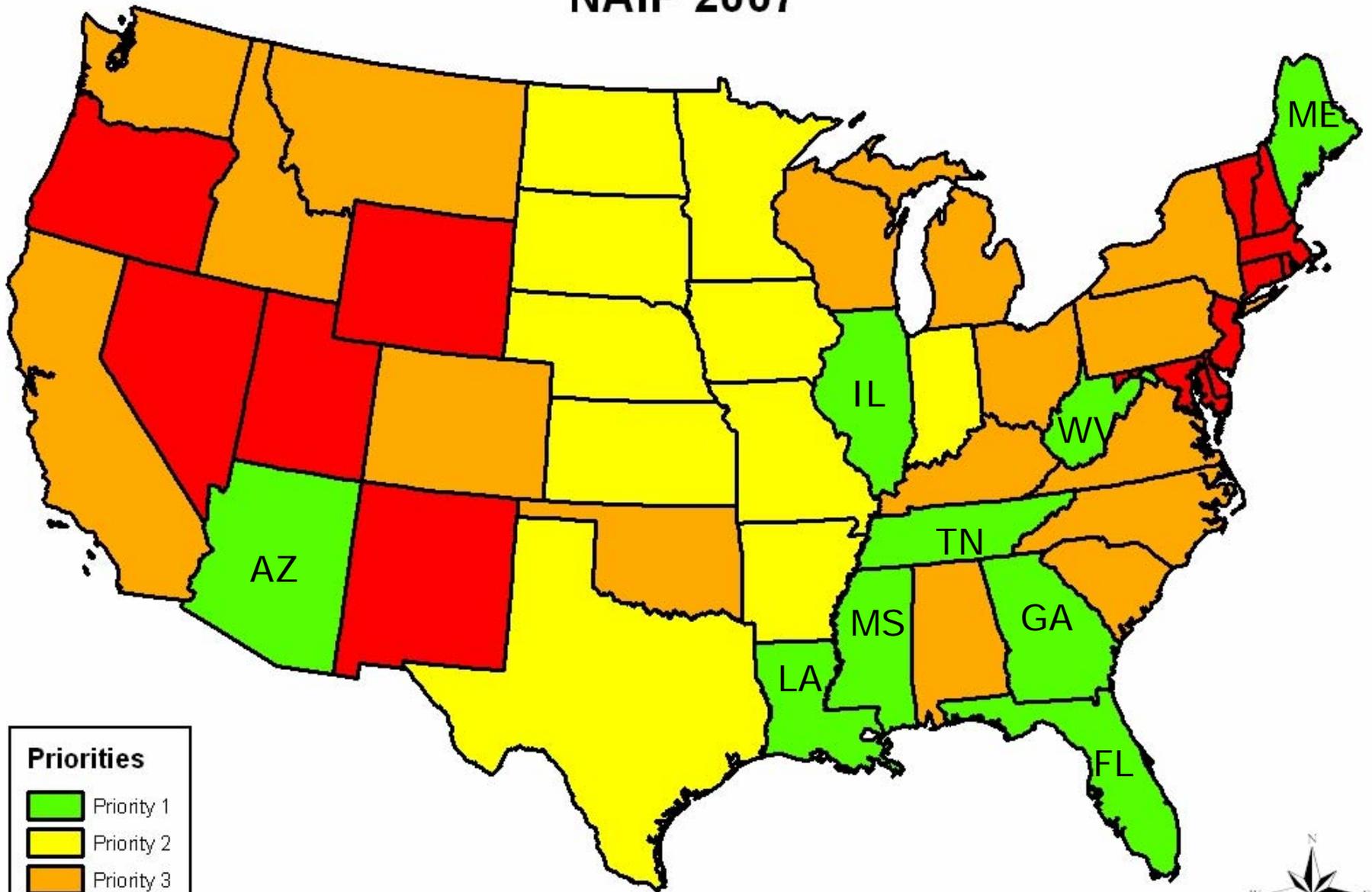
3,015 Counties

Average Contract Price



- 2006
 - \$169/DOQQ for 1 meter
 - \$150/DOQQ for 2 meter
- 2007 - ESTIMATE
 - \$180/DOQQ for 1 meter
 - \$150/DOQQ for 2 meter

NAIP 2007



Priorities

-  Priority 1
-  Priority 2
-  Priority 3
-  Priority 4



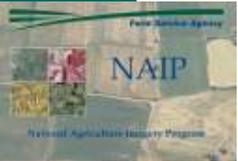
Partnership Opportunities



- Add DOQQ coverage to FSA requirements
 - Areas must be contiguous and/or substantial size
- Upgrade imagery resolution from 2m to 1m
 - All imagery within a project area must be consistent
- Change from RGB to CIR with FSA approval
- Other products must be contracted directly with the NAIP contractor



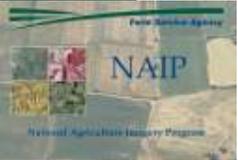
Partnership Opportunities



Why partner?

- Compressed County Mosaics (CCM) on delivery from vendors (30 days from flight)
- Quarter Quad Delivery (full resolution imagery)
- Cost effective acquisition of imagery
- Ensure coverage for state
 - States with cost sharing aren't dropped FSA requirements are for agricultural land
- Ensure program continuity

NAIP Partnership Agreements



2003 – 2006 NAIP Partners:

FEDERAL AGENCIES:

Natural Resource Conservation Service
U.S. Forest Service
U.S. Geological Survey
Bureau of Land Management
U.S. Air Force Space Command
U.S. Department of Interior Agencies

STATE AGENCIES:

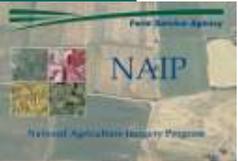
California, Colorado, Idaho, Illinois, Kentucky, Maryland,
Michigan, Minnesota, Missouri, Montana, Nevada, North
Carolina, Ohio, Oklahoma, Oregon, Pennsylvania,
Tennessee, Texas, Utah, Washington

Cost Share Scenarios

Partnership agreements are based on official government cost estimate, regardless of actual negotiated contract amount

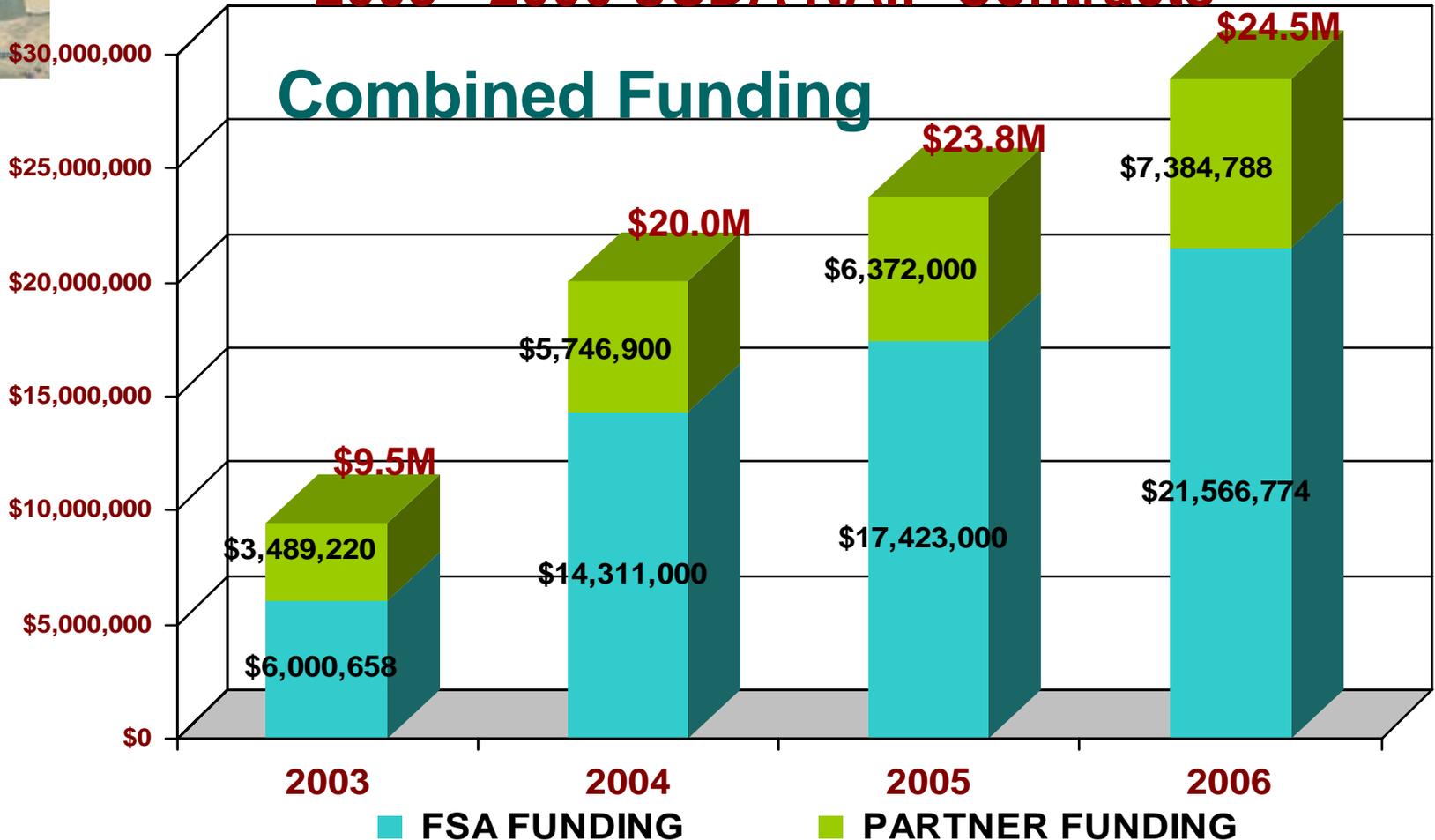
FSA administrative fee is not assessed

NAIP is a super deal



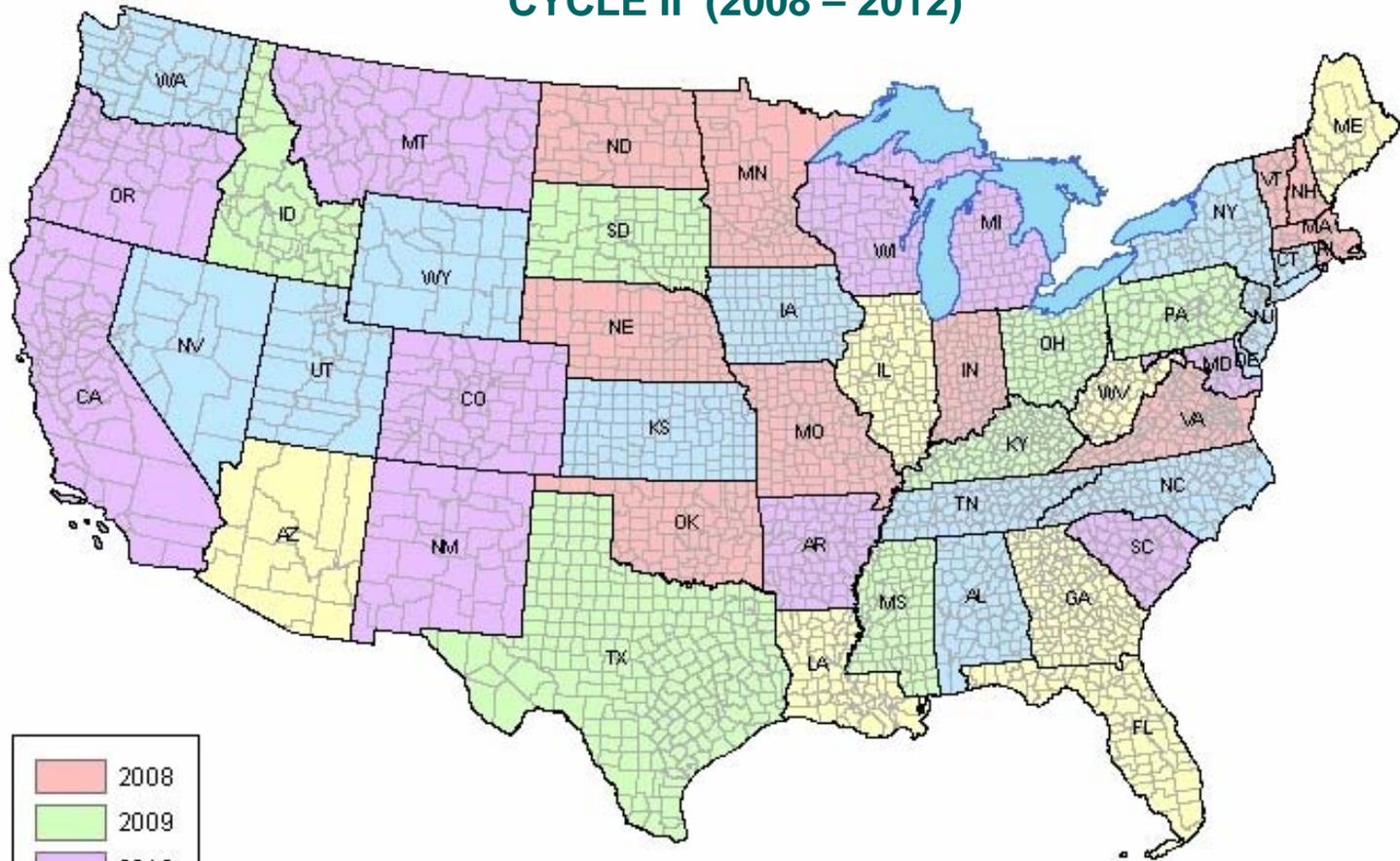
NAIP Funding History

2003 - 2006 USDA NAIP Contracts



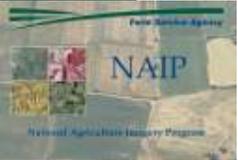
NATIONAL AGRICULTURE IMAGERY PROGRAM PROPOSED 5 YEAR 1 METER CYCLE

CYCLE II (2008 – 2012)



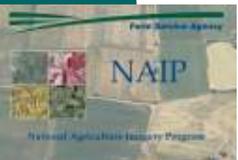
Approximately 10 states or 20% one meter coverage per year

NAIP 2007 – Improvements to Implement with Partners



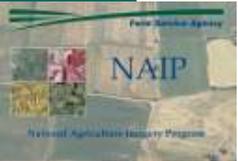
- Improved Horizontal Accuracy
 - Absolute accuracy specification (7 meter CE95)
 - Need additional control
 - Confidence in DEMs (NED)
- 4-Band Imagery
 - Requires digital camera
 - Support color infrared and RGB deliverables
- Improved acquisition metadata
 - Sensor mosaic cut line/polygon
 - Acquisition date

Challenges



- FUNDING
- Acquisition within the FSA flying season
- Color quality issues
 - Target image
 - Vendor visits
 - Image chain analysis (ITT JACIE Poster)
 - User requirements/perception
 - Processing “best practices”
- Delivery/Access

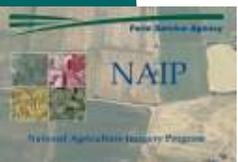
NAIP and Imagery for the Nation



What is Imagery for the Nation?

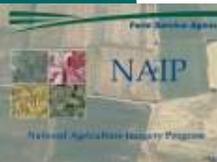


Imagery for the Nation



- Organized effort to acquire imagery over the entire US
- Initiated by National State Geographic Information Council
- Incorporates current USDA and USGS programs
- Includes Multi-Resolution acquisition (6", 1', 1-meter)
- Annual collection and repeat cycles of 3 to 5 years
- Imagery stays in public domain
- Consistent national standards (image type/quality & security concerns)
- Proposes Federal government funds program

NAIP and Imagery For The Nation



Federal Program Steward:
**U.S. Department of Agriculture
Farm Service Agency
Except USGS for Alaska**

Location and threshold

Entire nation, including all
insular areas and territories

Frequency: Every year in
the 48 conterminous states,
Every five years in Alaska,
Every three years in Hawaii,
insular areas & territories.

Buy-up Options: 100% cost
for CIR or 4 band products,
100% cost for increased
horizontal accuracy.

- One meter resolution
- Natural color
- Leaf-on
- 10% cloud cover
- 25 feet at 95%, NSSDA

FSA Points of Contact

FSA GIS Program Manager

Shirley Hall (202) 720-3138

Shirley.Hall@wdc.usda.gov

APFO NAIP Program Manager

Kent Williams (801) 975-3500 X261

Kent.Williams@slc.usda.gov

Partnership Information

Cindy Sessions – Partnership Coordinator

(801) 975-3500 X208

Cindy.Sessions@slc.usda.gov

