

National Agriculture Imagery Program NAIP Informational Meeting

July 19, 2006

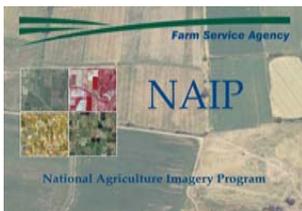
Washington DC

Kent Williams

NAIP Program Coordinator

USDA Farm Service Agency

Aerial Photography Field Office (APFO)



USDA Aerial Photography Field Office

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Salt Lake City, Utah 84119-2020

www.apfo.usda.gov

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APFO is the primary source of aerial imagery for USDA Agencies. Over 10 million images, from 1955 through the present, are libraried here.

Outline

- Products
- Coverage
- Delivery/Access
- Delivery Timeline
- NAIP status information

Why Partner in NAIP?

- Ensure Program Viability
- Coverage Based on your Requirements
- Best Access to the Imagery

USDA Farm Service Agency

Requirements for Ortho Imagery

- **Keep Farm Records Current**
 - Common Land Unit
 - Farm field boundaries managed in GIS
 - Ortho Image Base 3-5 years old
- **Crop/Commodity “Compliance”**
 - Ensure farm program conditions met
 - Annual Acquisition
 - Delivery before crop harvest

Ortho Image Base and CLU



Harlan County, KY
1998 Ortho

Ortho Image Base and CLU



Harlan County, KY
2004 NAIP

Ortho Image Base and CLU



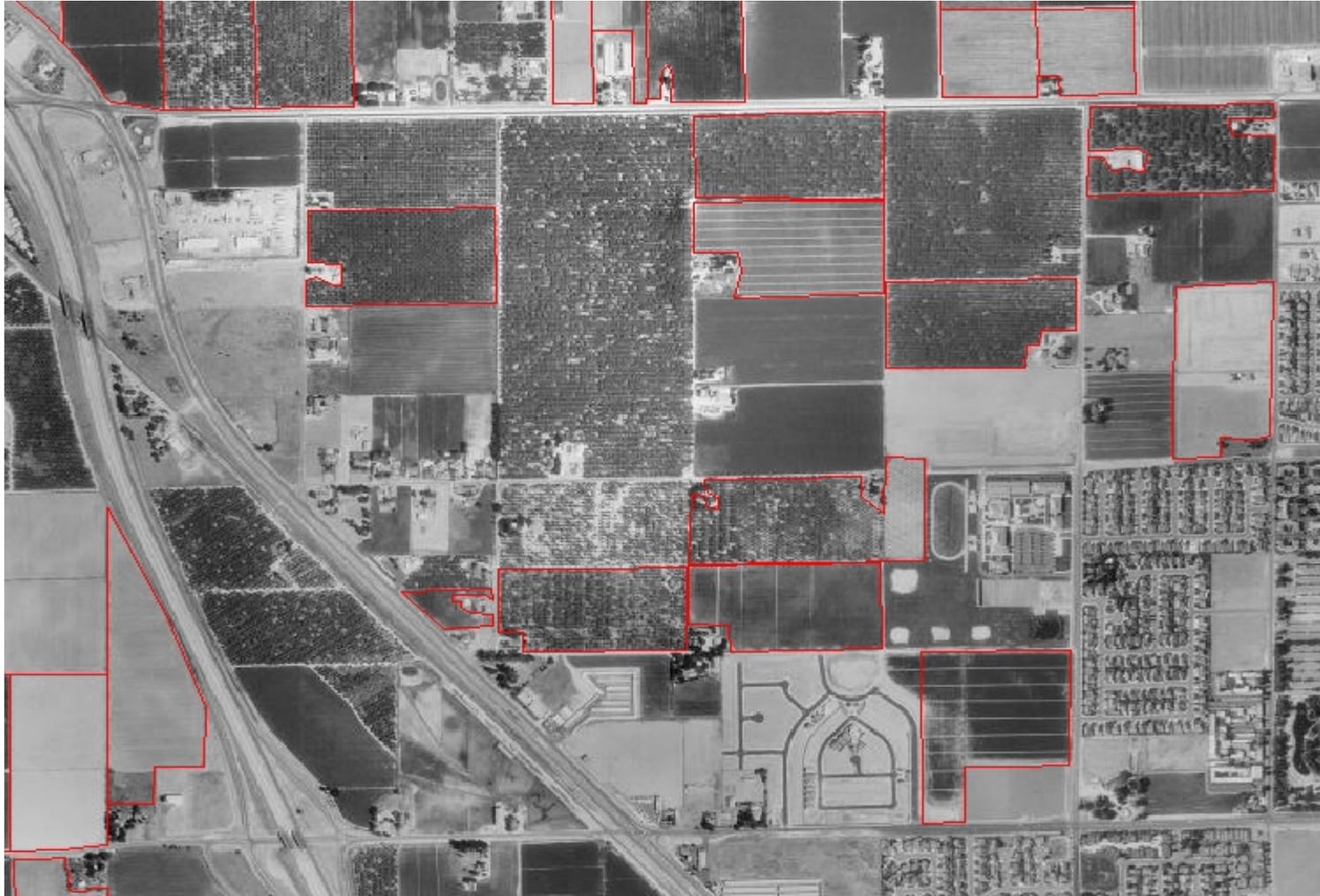
Franklin County, OH
1994 Ortho Base

Ortho Image Base and CLU



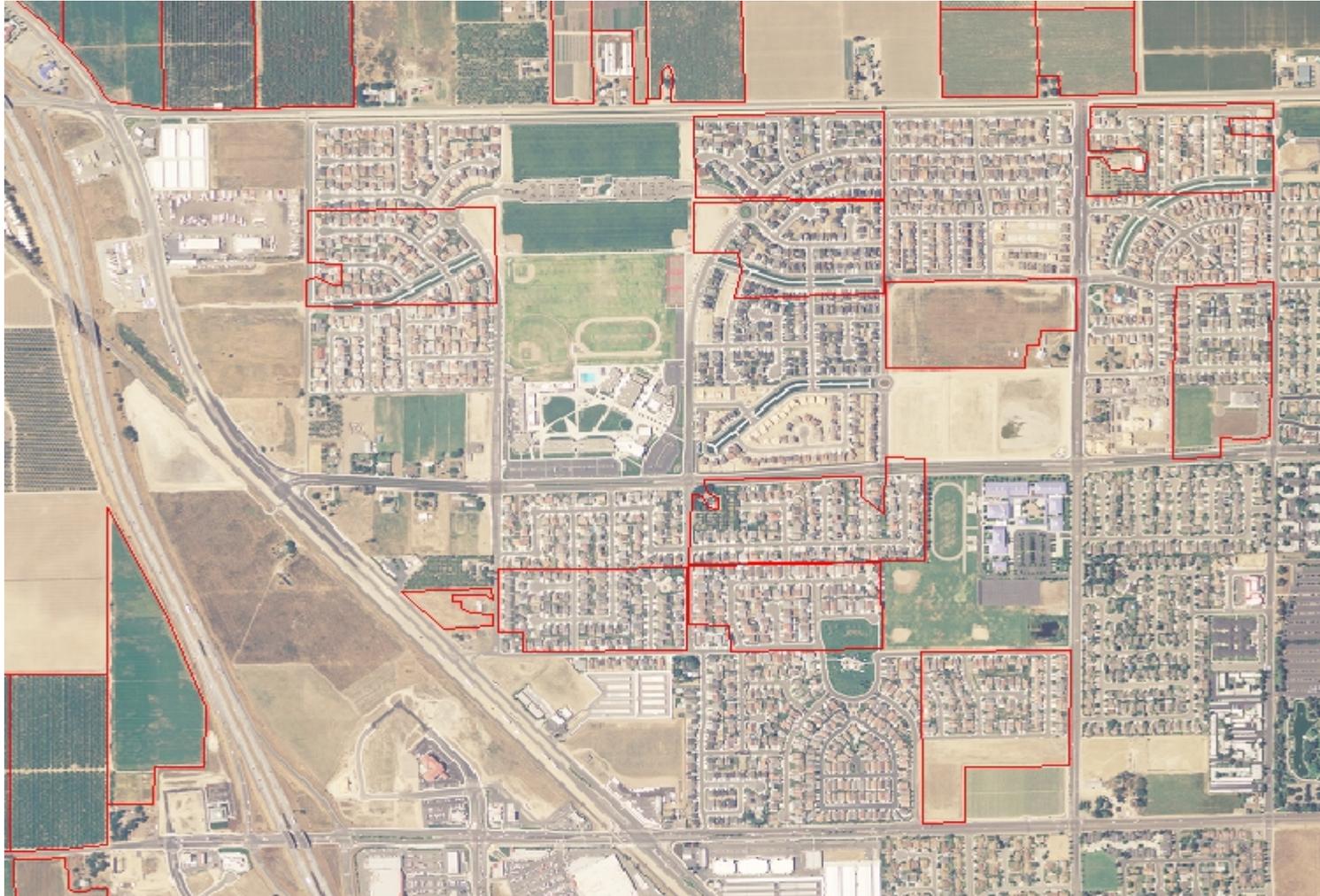
Franklin County, OH
2004 NAIP

Ortho Image Base and CLU



San Joaquin Valley, CA
1998 DOQs

Ortho Image Base and CLU



San Joaquin Valley, CA
2005 NAIP

NAIP 2006

Specifications

- 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

NAIP Acquisition

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

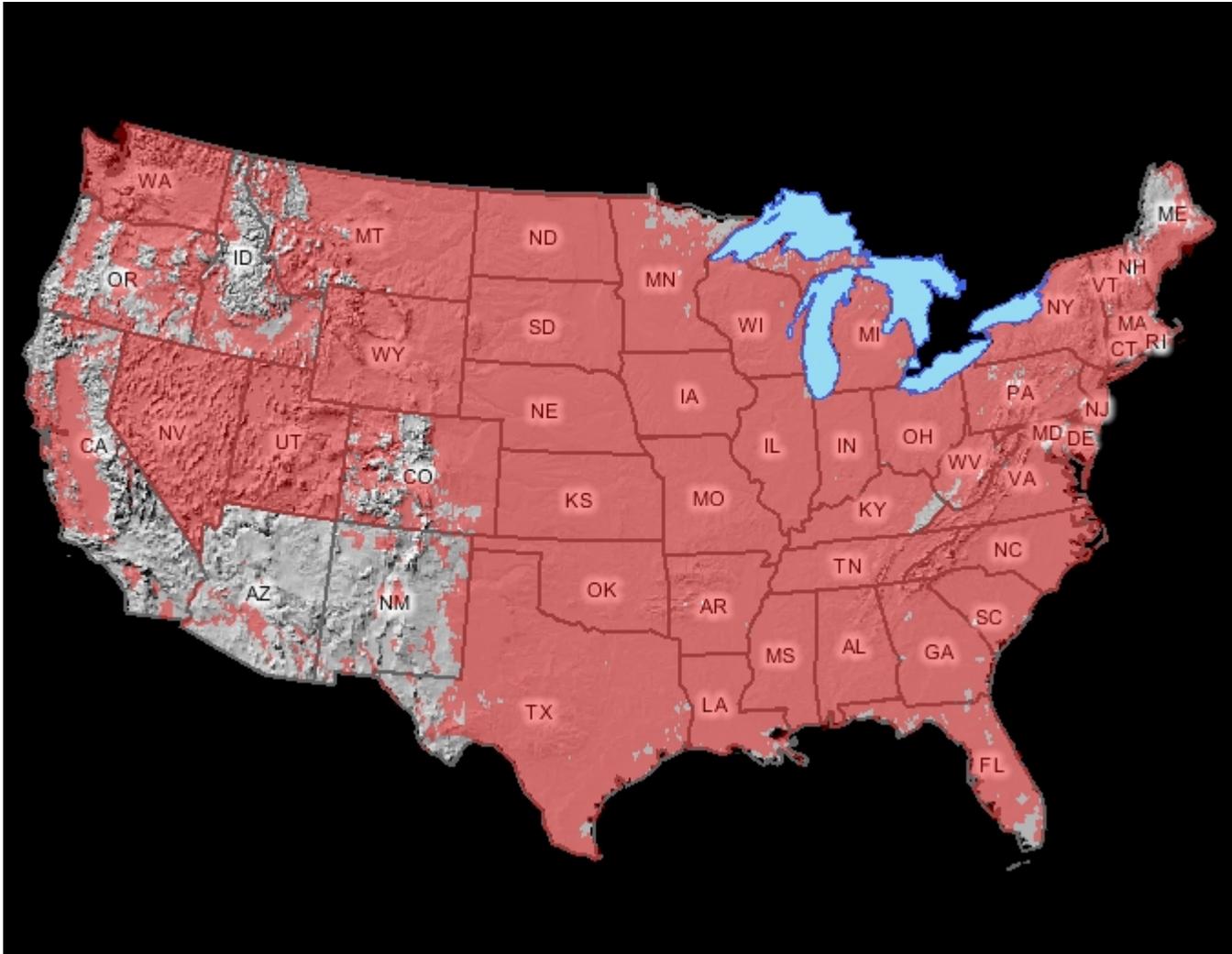
NAIP Products

- Compressed County Mosaic (CCM)
 - MrSID MG3 format
 - 15:1 compression ratio
- Quarter Quads
 - GeoTIFF
 - Full resolution

NAIP Coverage

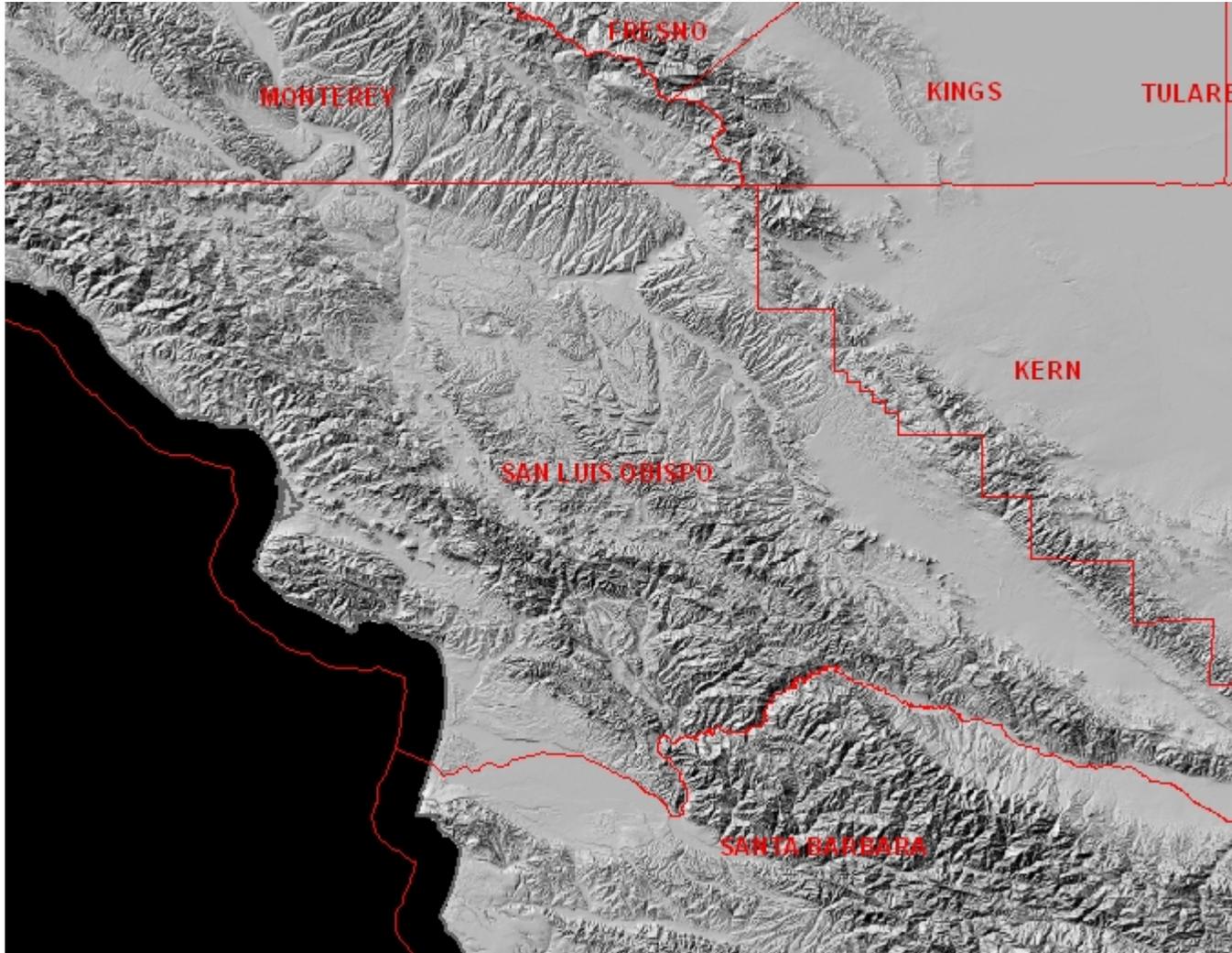
- FSA Core Requirements
 - Agricultural areas
 - 2 meter GSD annually,
 - 1 meter on 3-5 year cycle
- With Cost Share Partners
 - Partner Requirements
 - 1 meter GSD

FSA Requirements



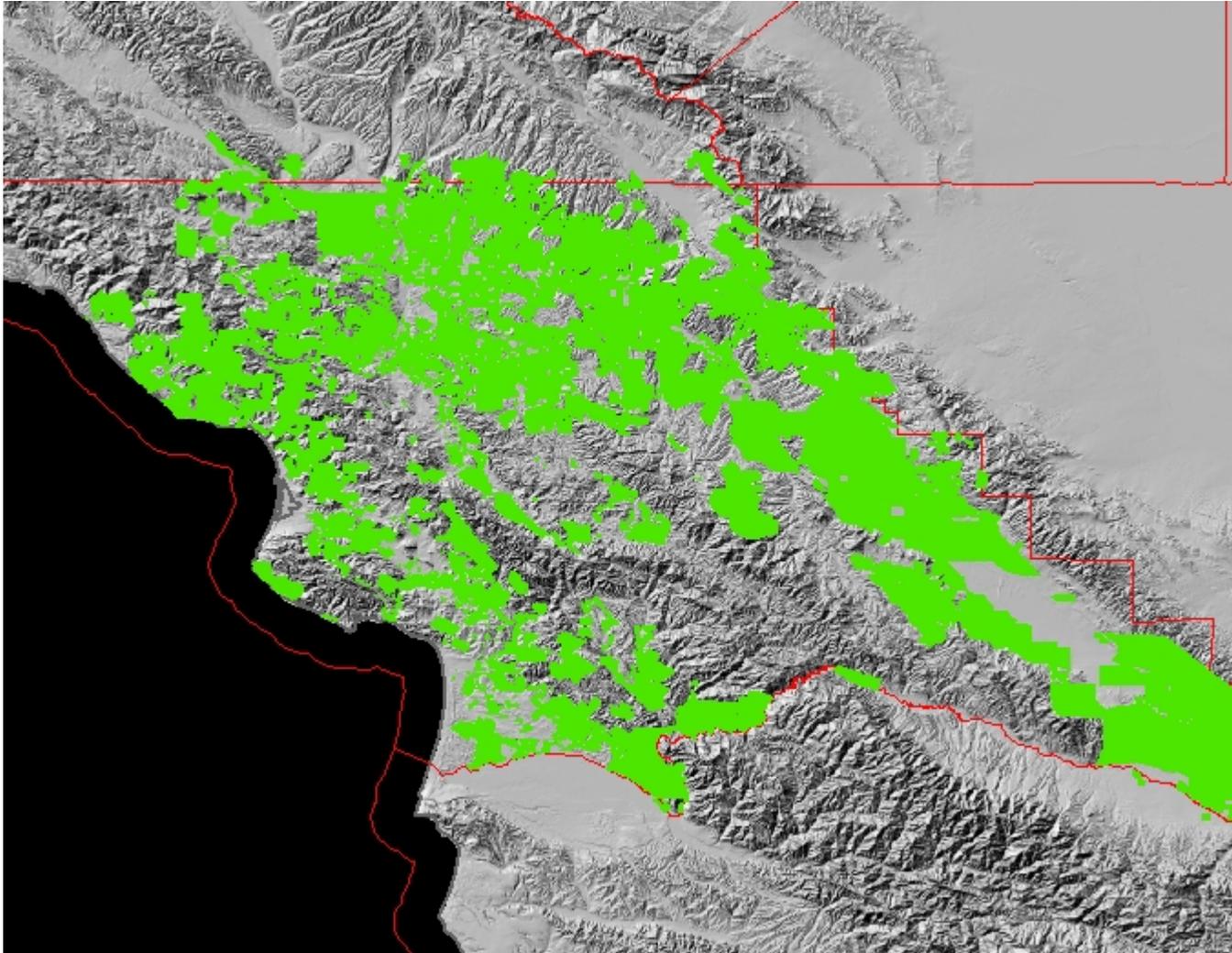
NAIP 2006 Coverage

FSA Requirements



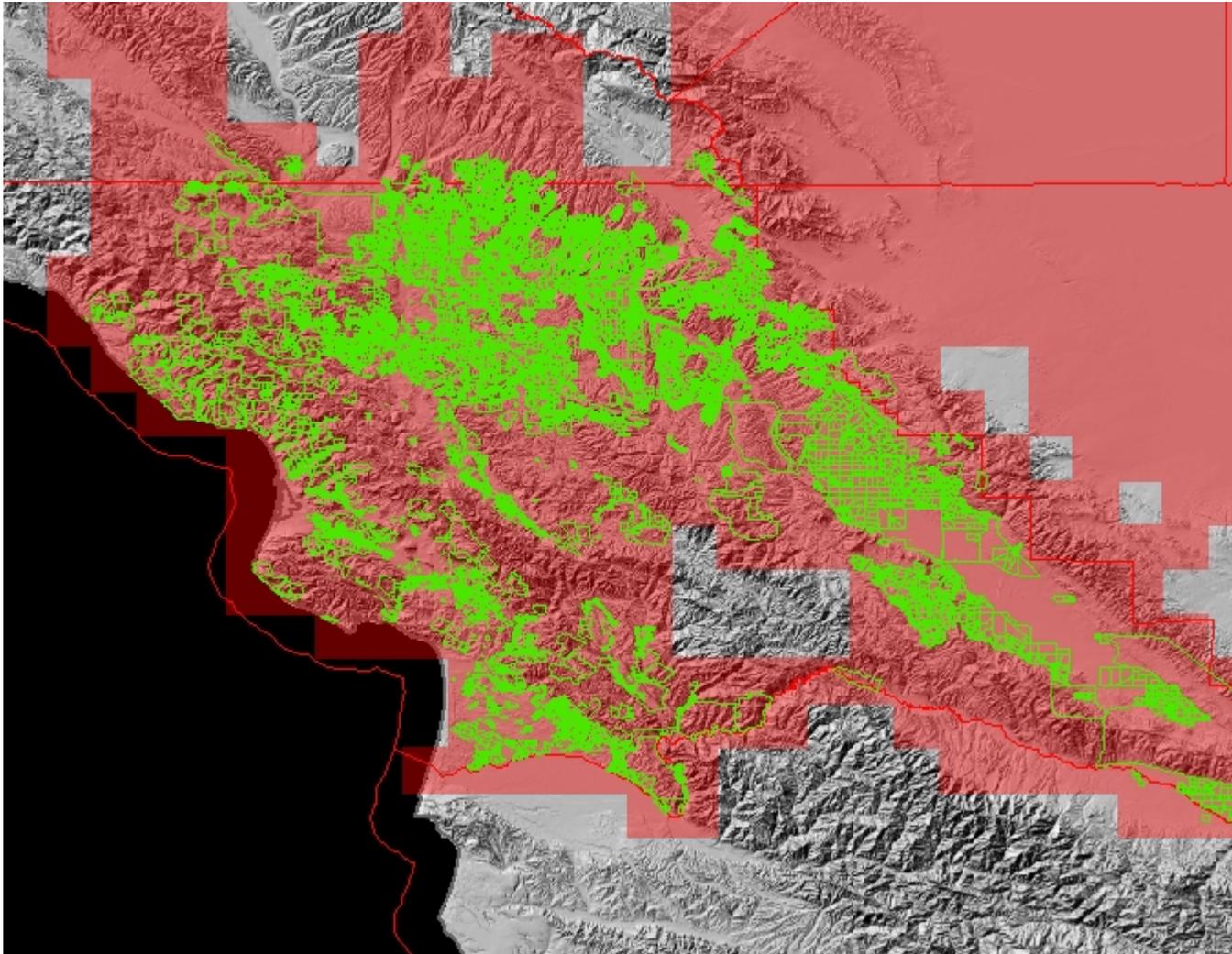
San Luis Obispo County, California

FSA Requirements – Agricultural Areas



San Luis Obispo County, California

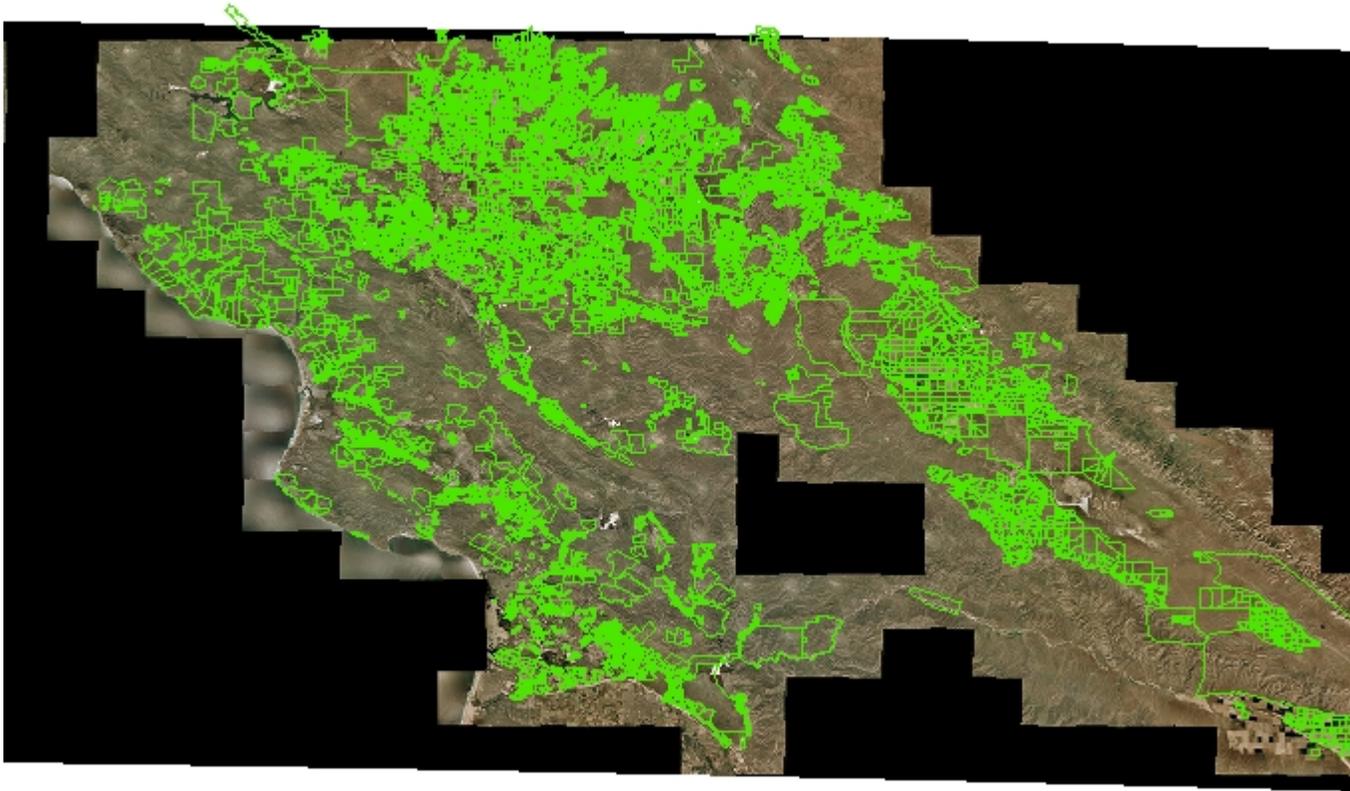
FSA Requirements – Agricultural Areas



San Luis Obispo County, California

FSA Requirements

Compressed County Mosaic and CLU



San Luis Obispo County, California

FSA Requirements – Annual Coverage



San Luis Obispo County, California

9/10/2003

FSA Requirements – Annual Coverage



San Luis Obispo County, California

9/28/2004

FSA Requirements – Annual Coverage



San Luis Obispo County, California

6/06/2005

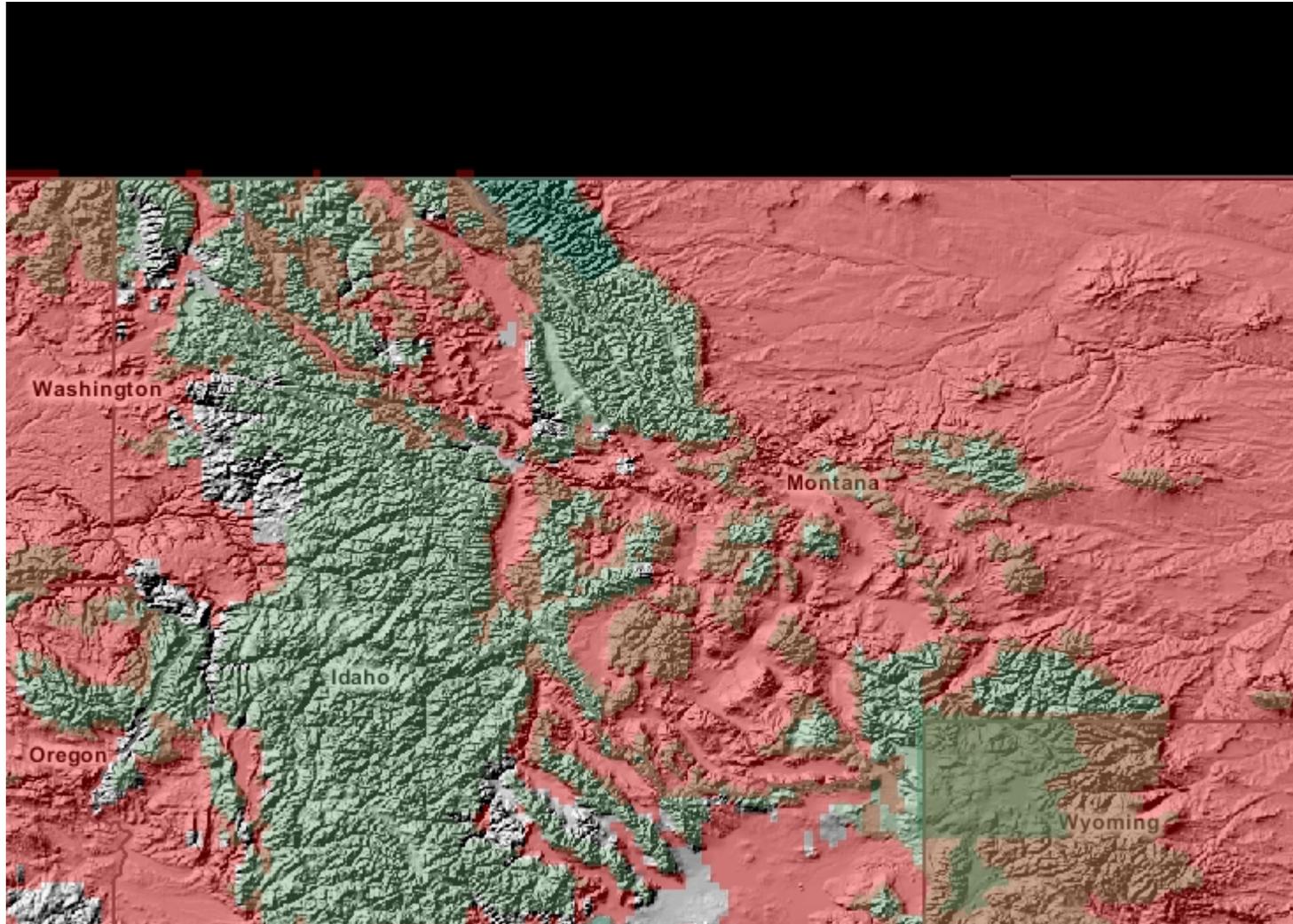
FSA Requirements – Annual Coverage



San Luis Obispo County, California

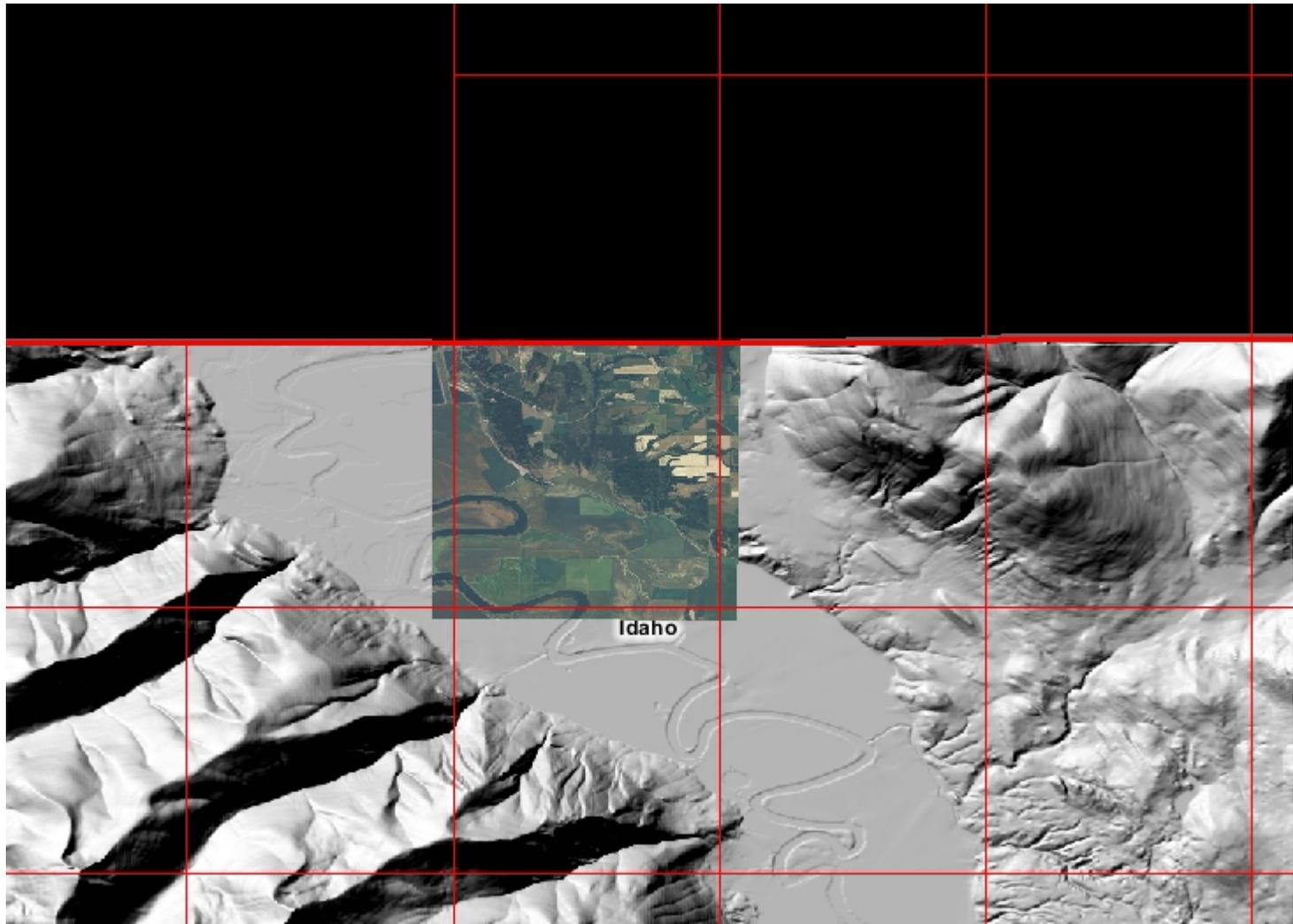
6/30/2006

FSA Coverage



FSA Coverage

Idaho/Montana

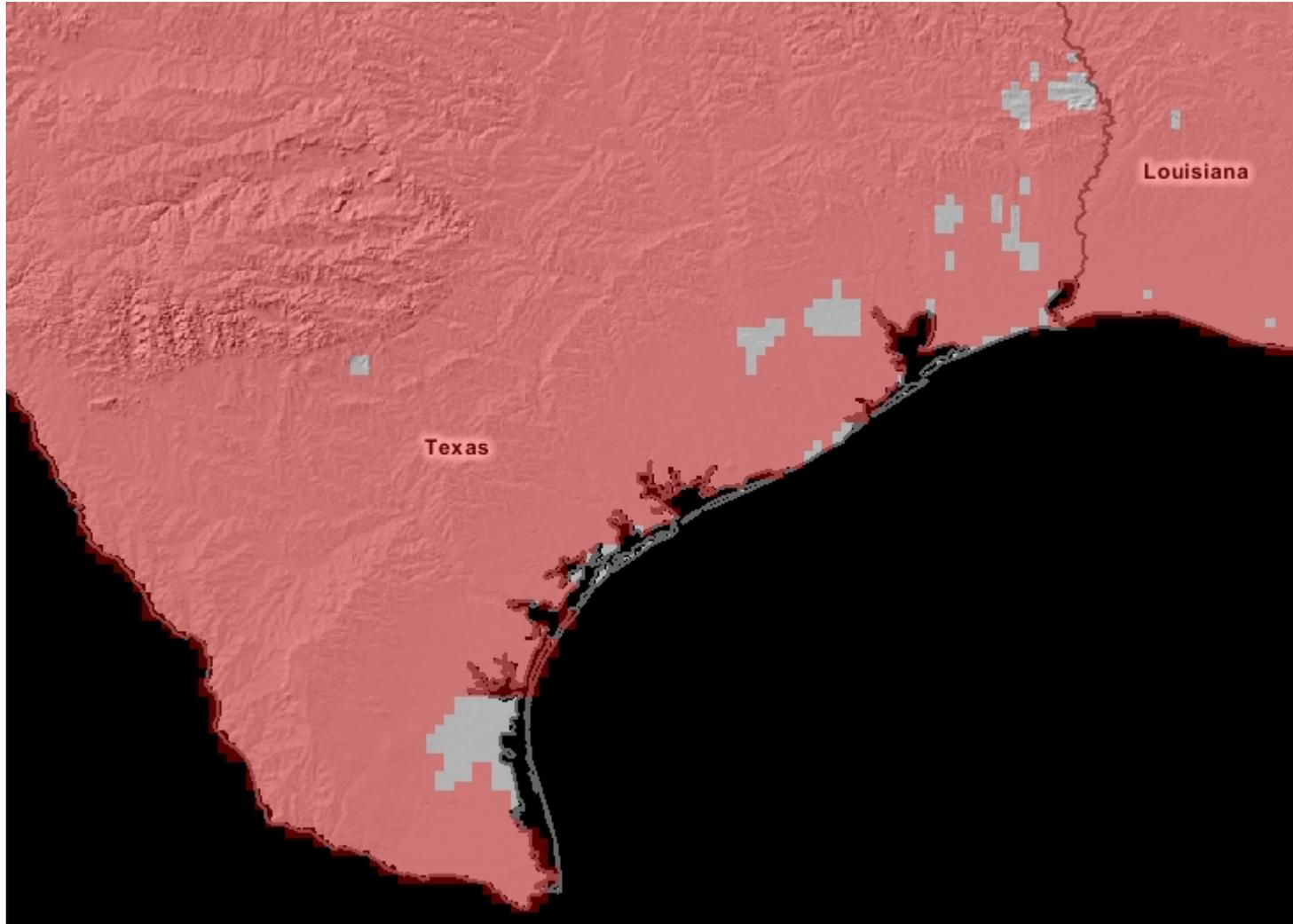


NAIP 2004 Porthill ID



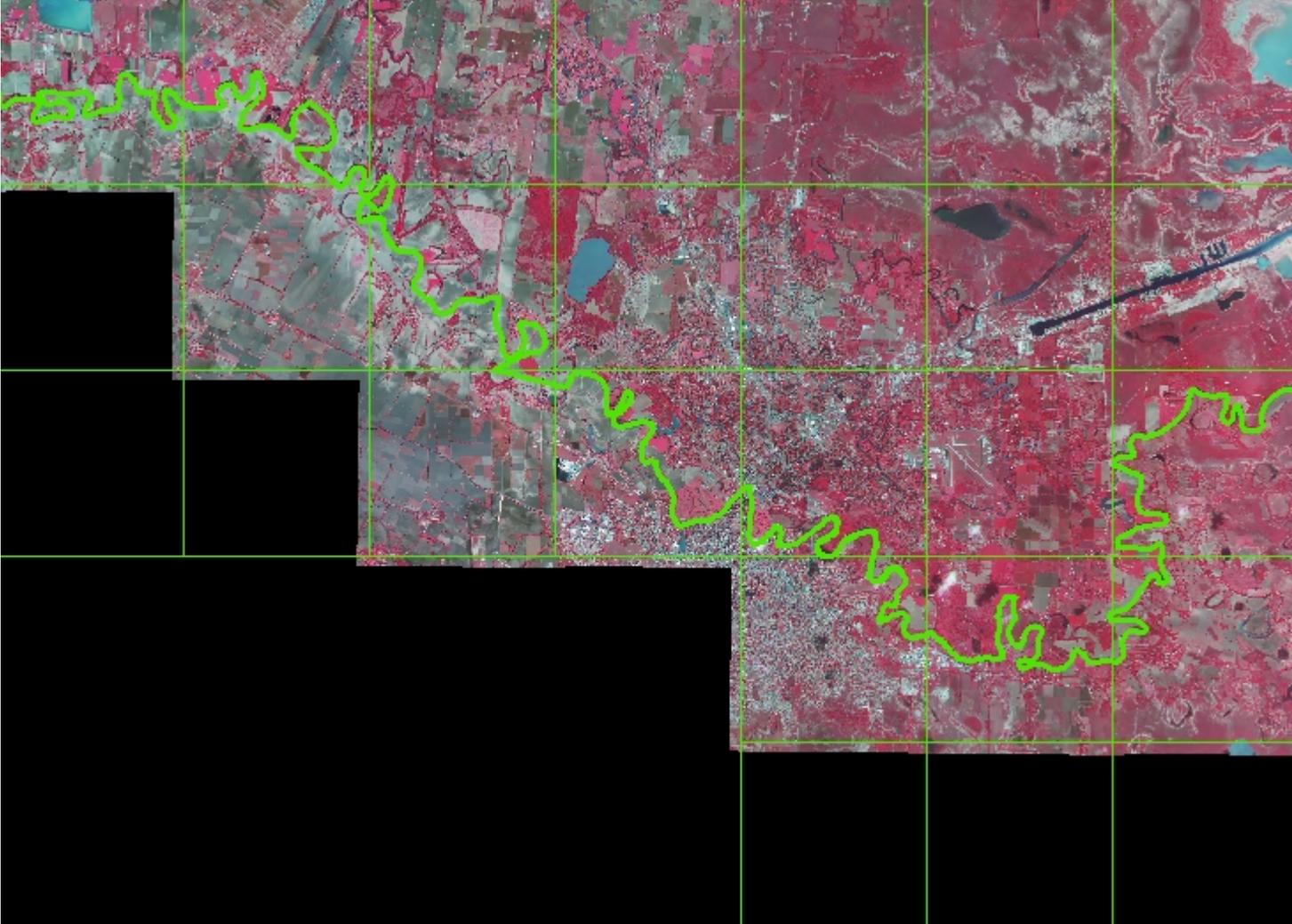
POrthill ID, 2004 NAIP 1 meter GSD

NAIP Coverage



FSA Coverage

Texas Coast





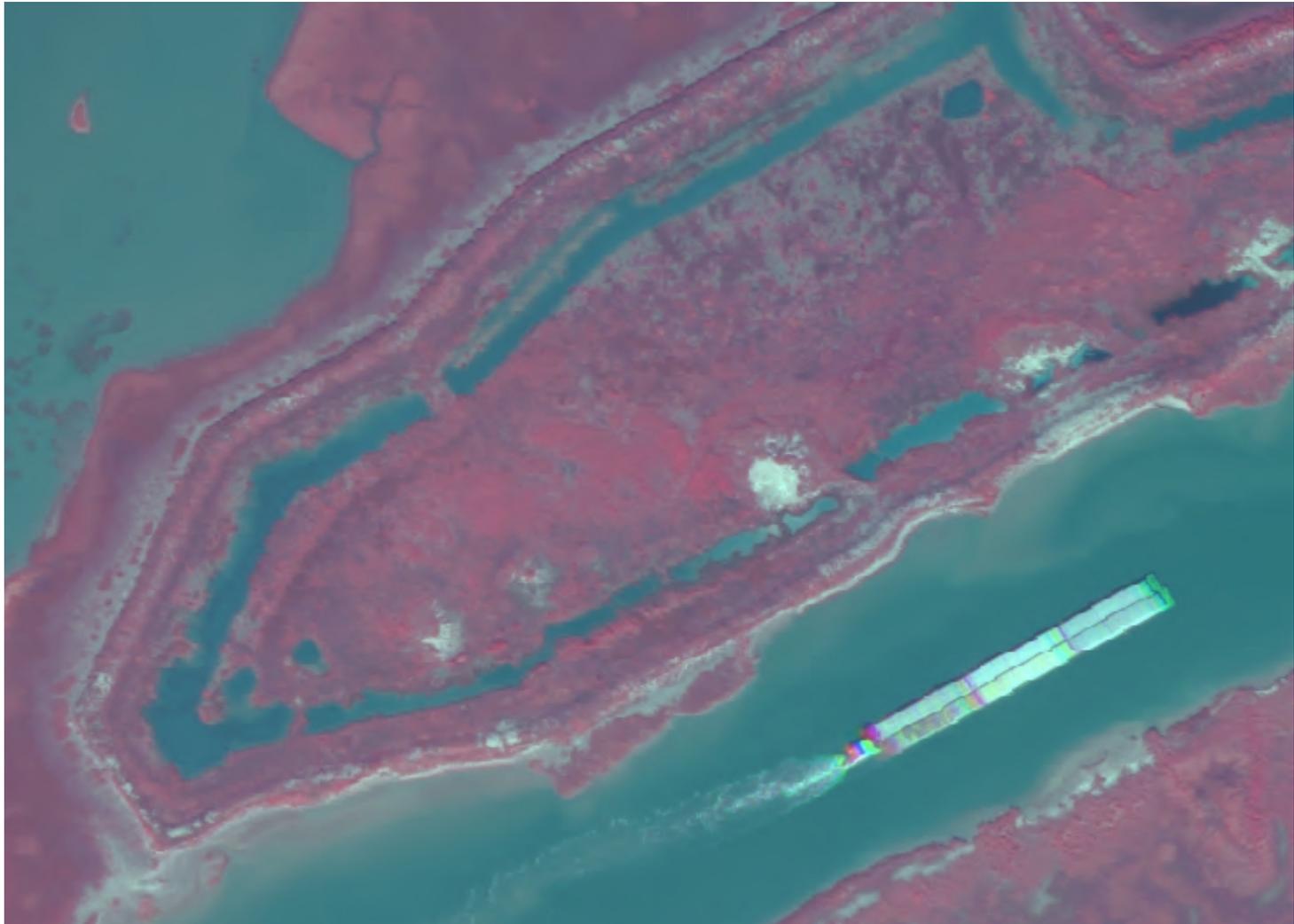
Brownsville, Texas Internal Border Entry

NAIP 2004 1



San Bernard National Wildlife Refuge, Texas

NAIP 2004

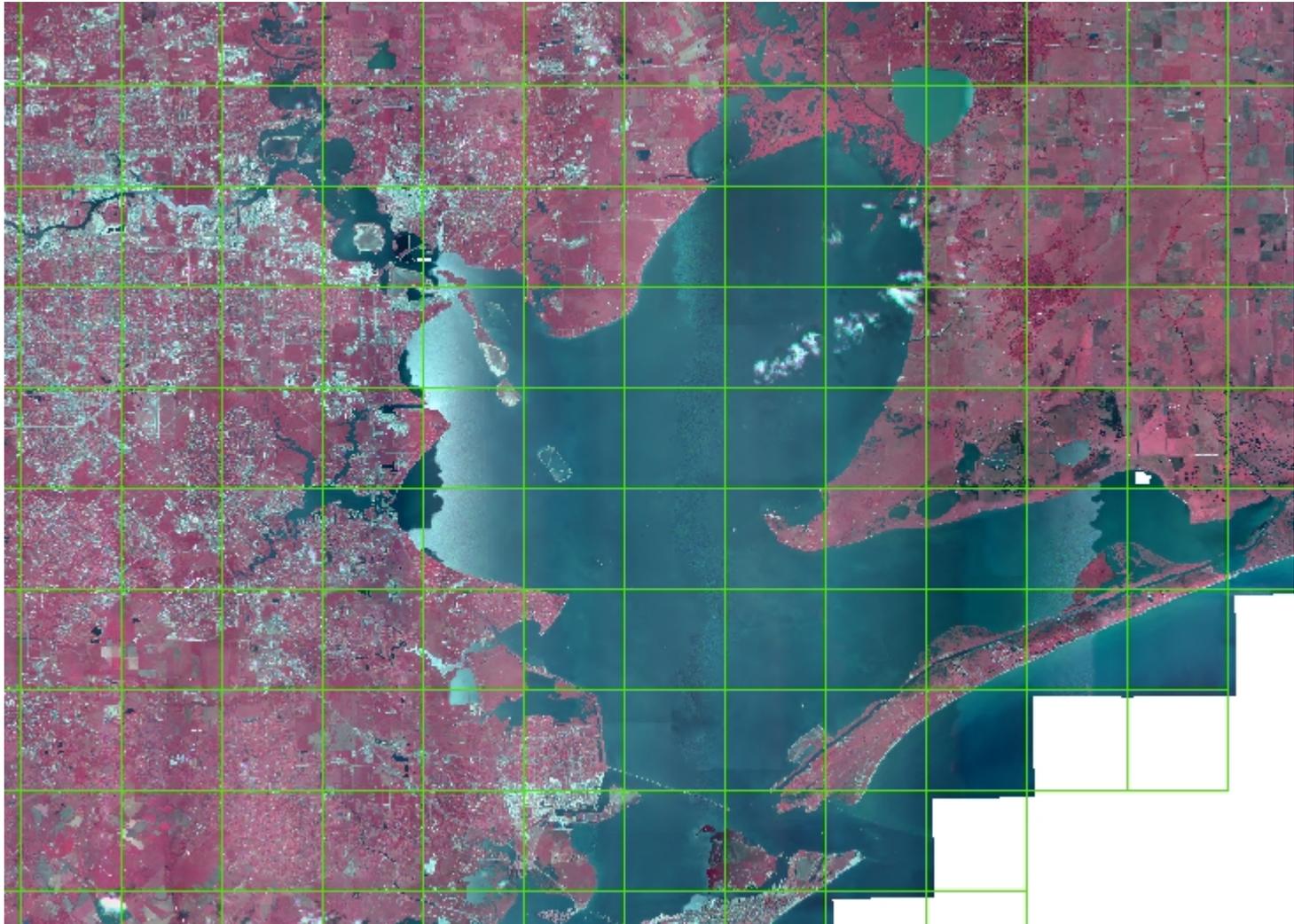


San Bernard National Wildlife Refuge, Texas

NAIP 2004



Galveston Bay, Texas



Galveston Bay, Texas

NAIP 2004



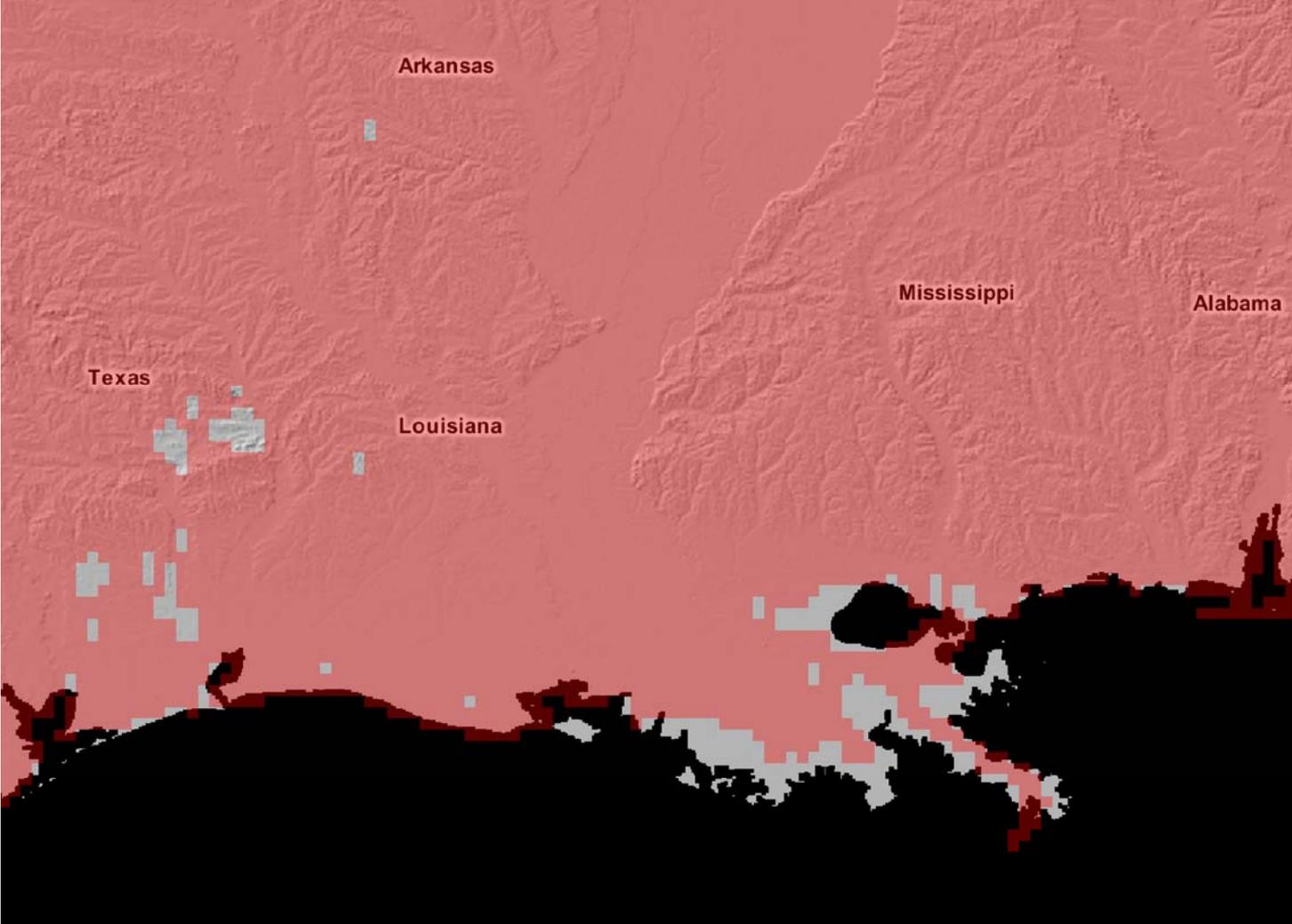
Galveston Port Facilities, Texas

NAIP 2004

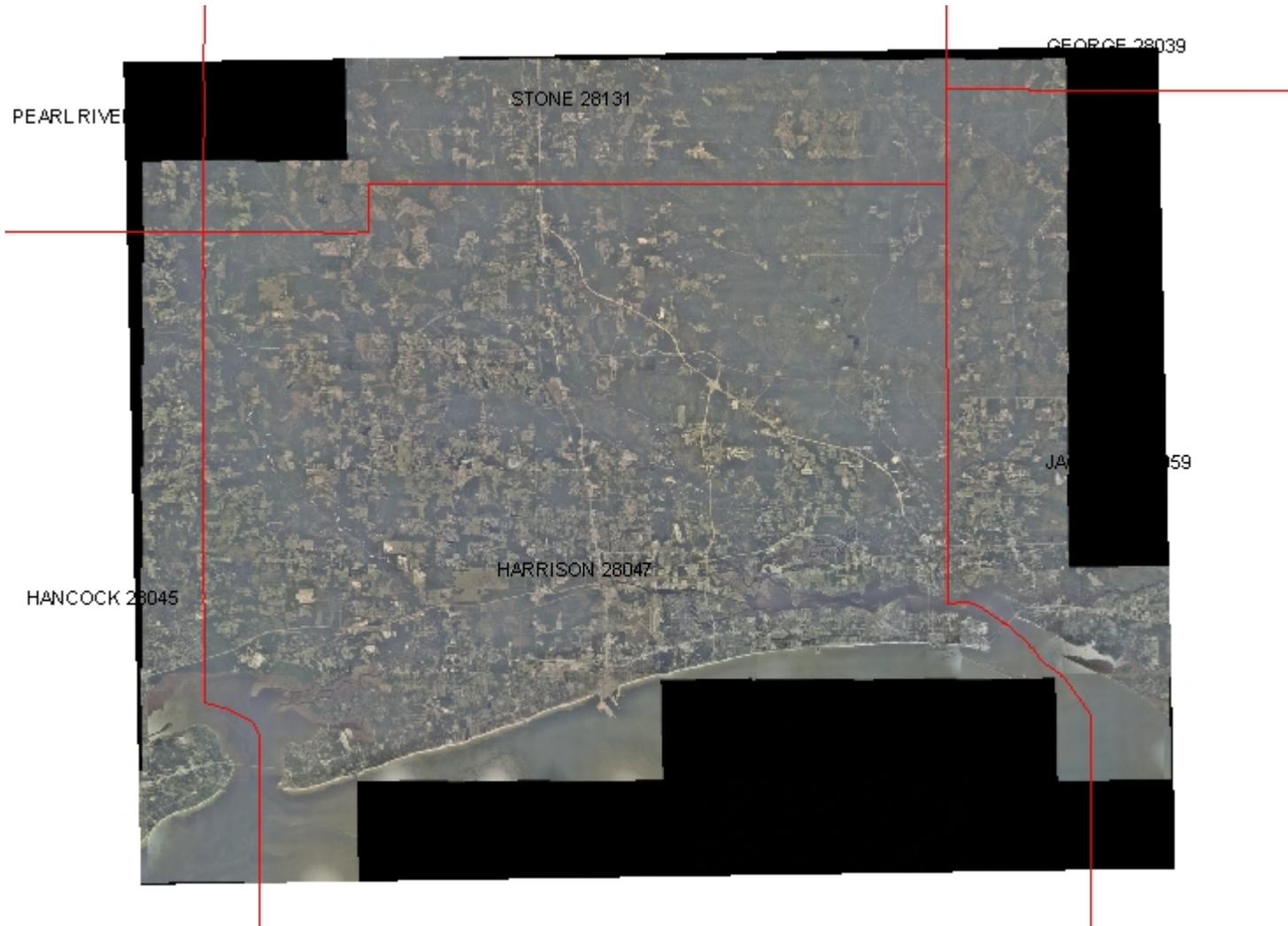


Galveston Port Facilities, Texas

NAIP 2004

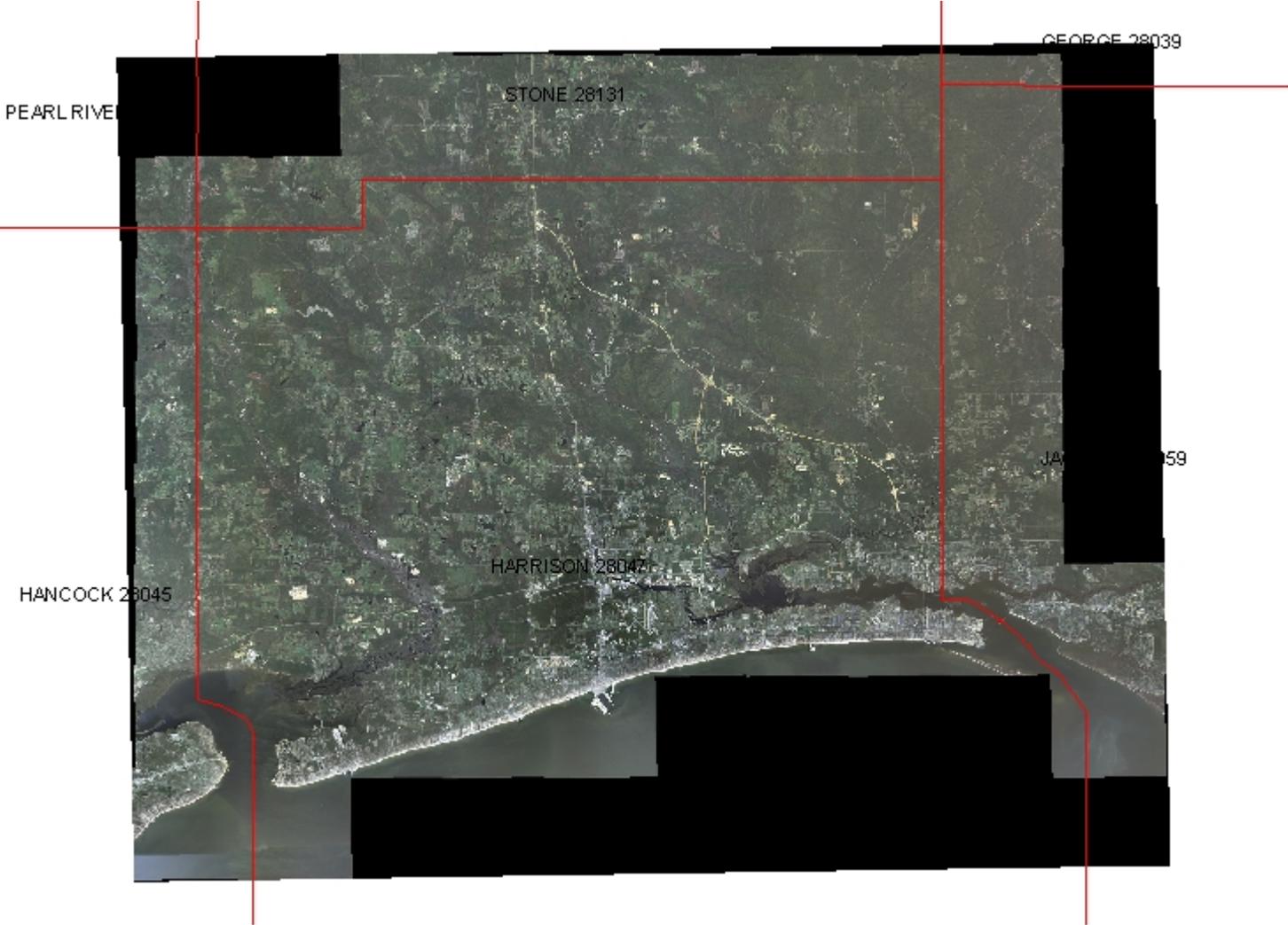


NAIP 2004



Harrison County, Mississippi

NAIP 2005 Post Katrina



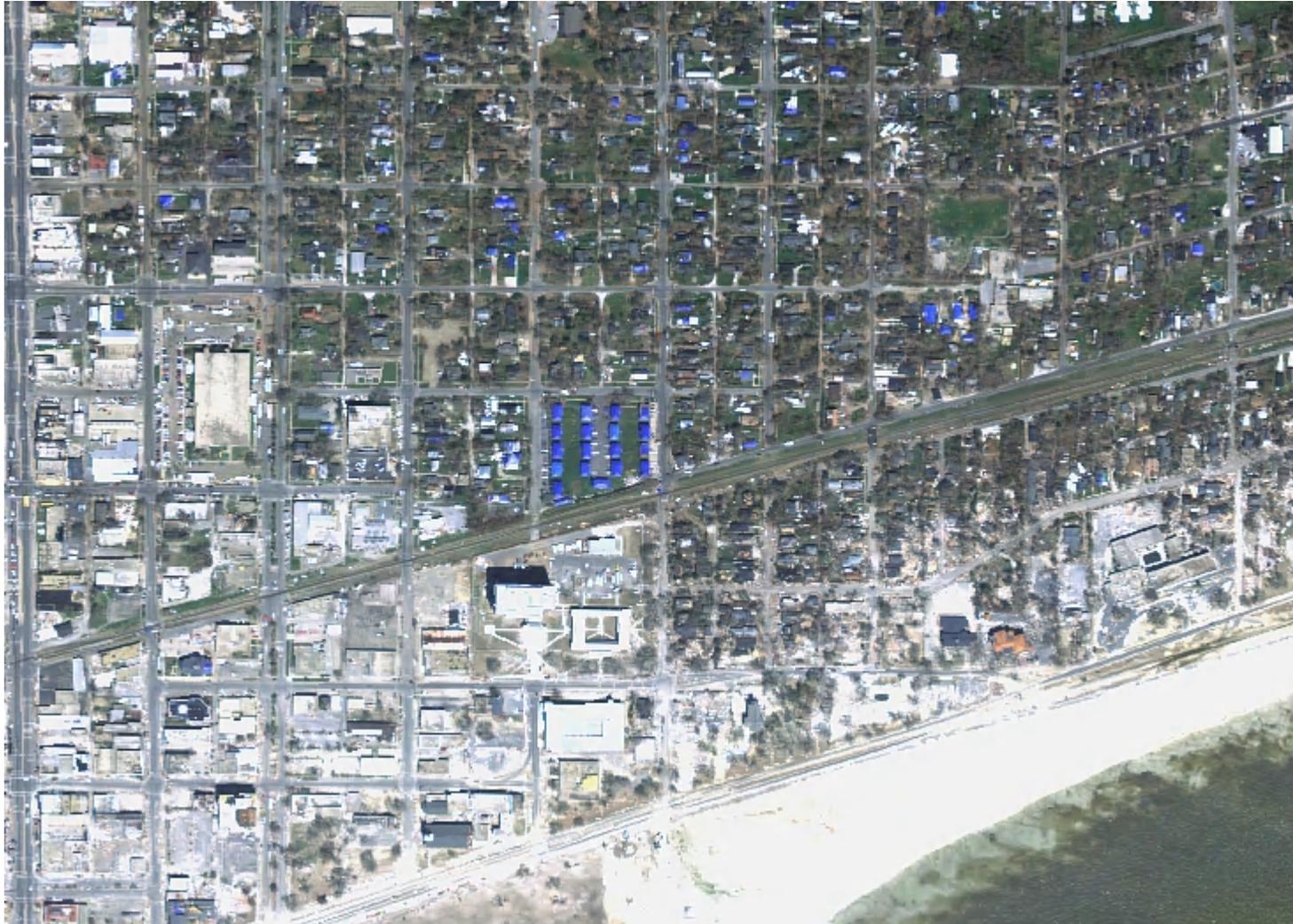
Harrison County, Mississippi

NAIP 2004



Gulfport, Mississippi

NAIP 2004



Gulfport, Mississippi

NAIP 2004



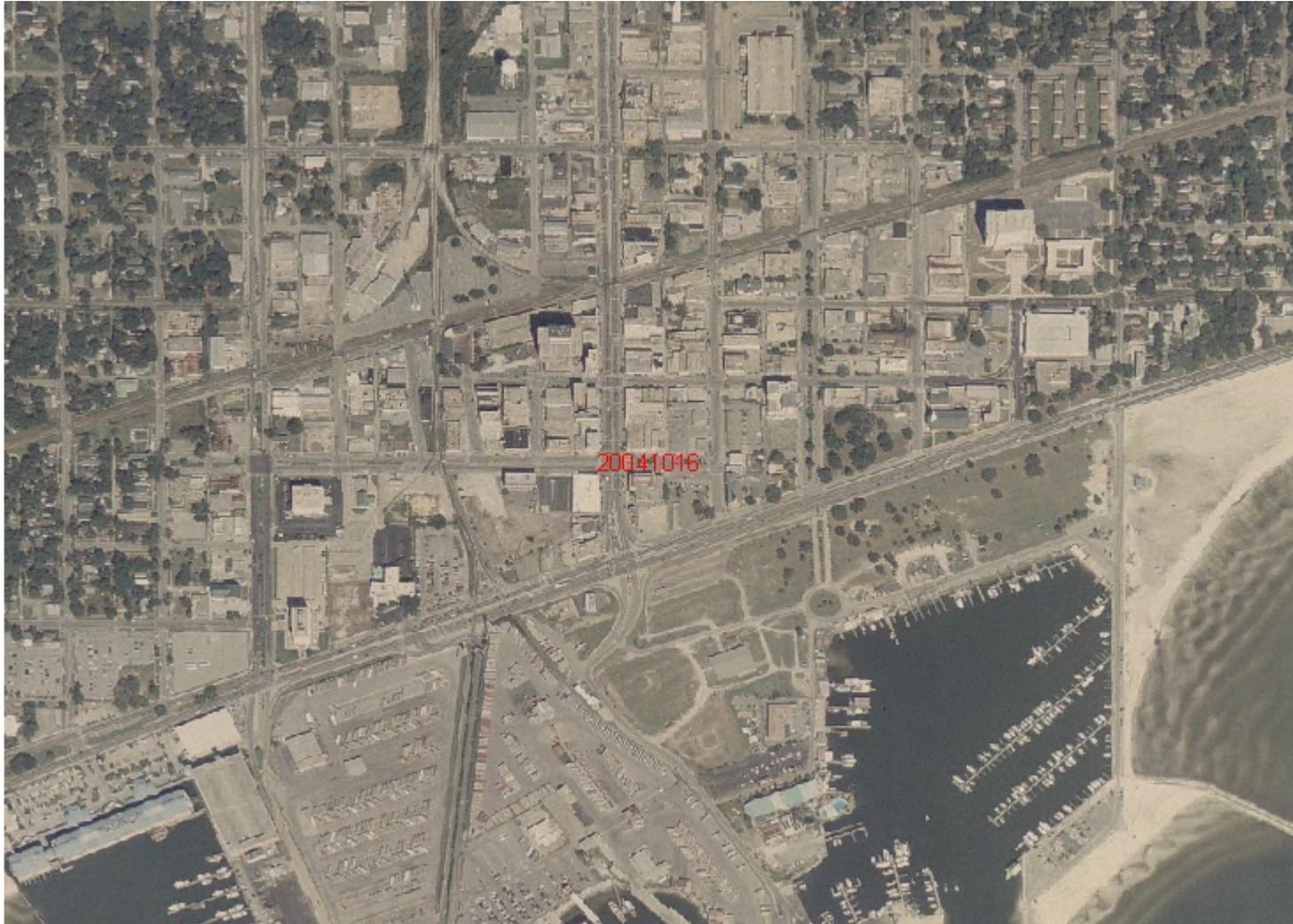
Gulfport, Mississippi

NAIP 2004



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Gulfport, Mississippi

NAIP 2004



Gulfport, Mississippi

NAIP 2004



Gulfport, Mississippi

NAIP 2005



Gulfport, Mississippi

2006 Hurricane Preparedness

- Gulf Coast and SE US
 - 2005 user-friendly CCMs and QQs packaged on HDD
 - 2006 CCM will be written to HDD as they come in
 - Access to APFO Data Provisioning System (Earthwhere)
 - CCMs on Gateway

NAIP Distribution/Access

- Download Compressed County Mosaics
- Bulk Orders on Hard Disk Drives
- Custom Provisioning/Delivery of Imagery
- Web Service (ArcIMS)

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

USDA Geospatial Data Gateway

NAIP Products Delivered in FY2006

- 40,000 CCMs
- 18 Tbytes

NAIP Distribution/Access

- Download Compressed County Mosaics
- Bulk Orders on Hard Disk Drives “as is”
 - CCMs for entire NAIP 2005
 - \$10,000
 - includes “interim versions”
 - no version management
- Partners
 - No cost
 - Get new versions

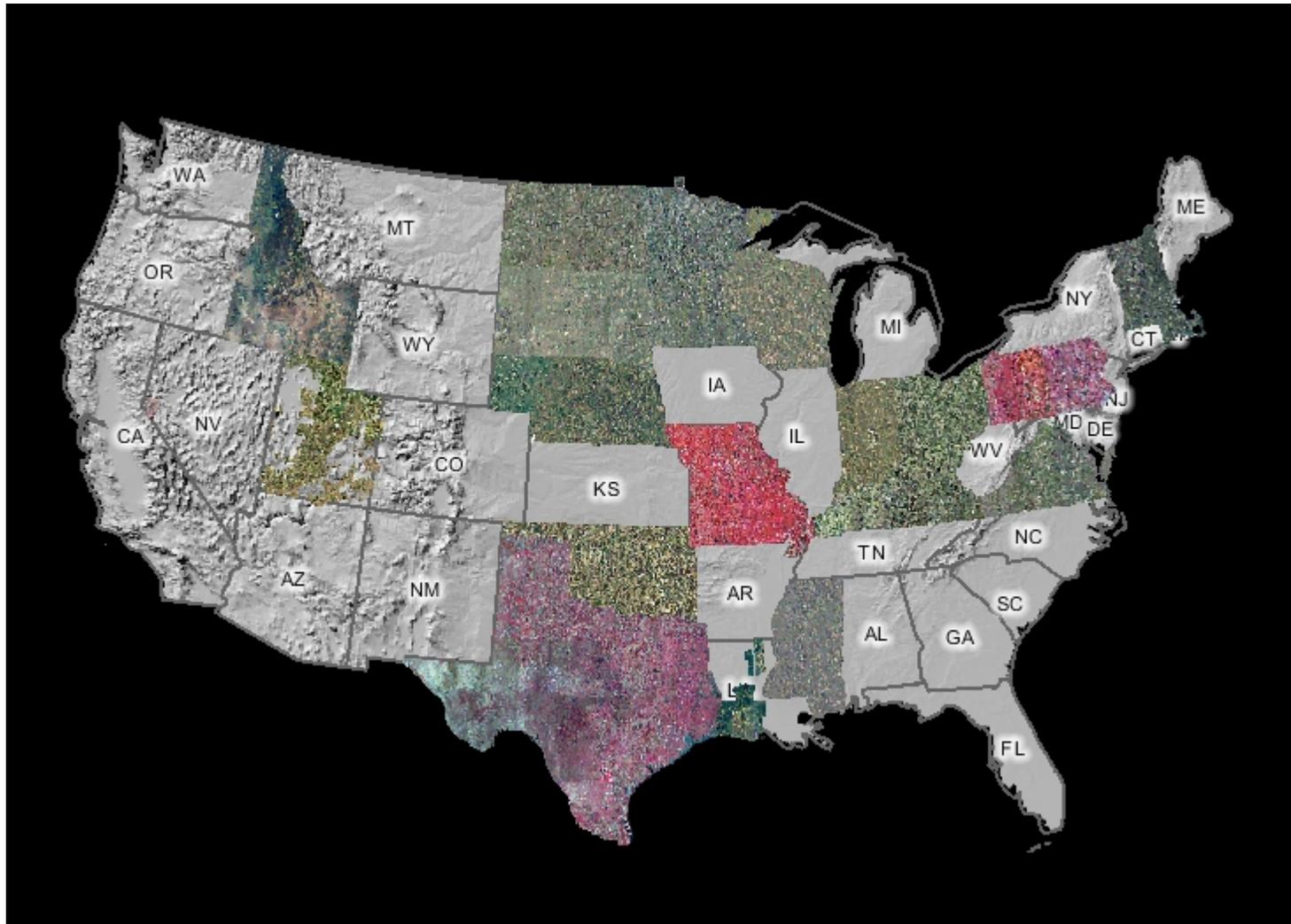
NAIP Distribution/Access

- Download Compressed County Mosaics
- Bulk Orders on Hard Disk Drives
- Custom Provisioning/Delivery of Imagery
 - APFO Data Provisioning System
 - Web based data discovery and ordering system
 - User defined AOI
 - User defined formats
 - User defined image processing

NAIP Distribution/Access

- Download Compressed County Mosaics
- Bulk Orders on Hard Disk Drives
- Custom Provisioning/Delivery of Imagery
- **Web Service (ArcIMS)**
 - Intended for dedicated service via USDA intranet
 - www.gdw.apfo.usda.gov
 - Partners
 - Account based access to WMS is planned

ArcIMS Web Service



NAIP 1 meter coverage

USDA Geospatial Data Warehouse (GDW)

- USDA Implemented Geospatial Data Warehouse (GDW) as part of the Service Center Modernization Initiative.
 - To facilitate archive storage, data access, browsing, retrieval, and use of GIS data.

GDW

● Two Geospatial Data Centers

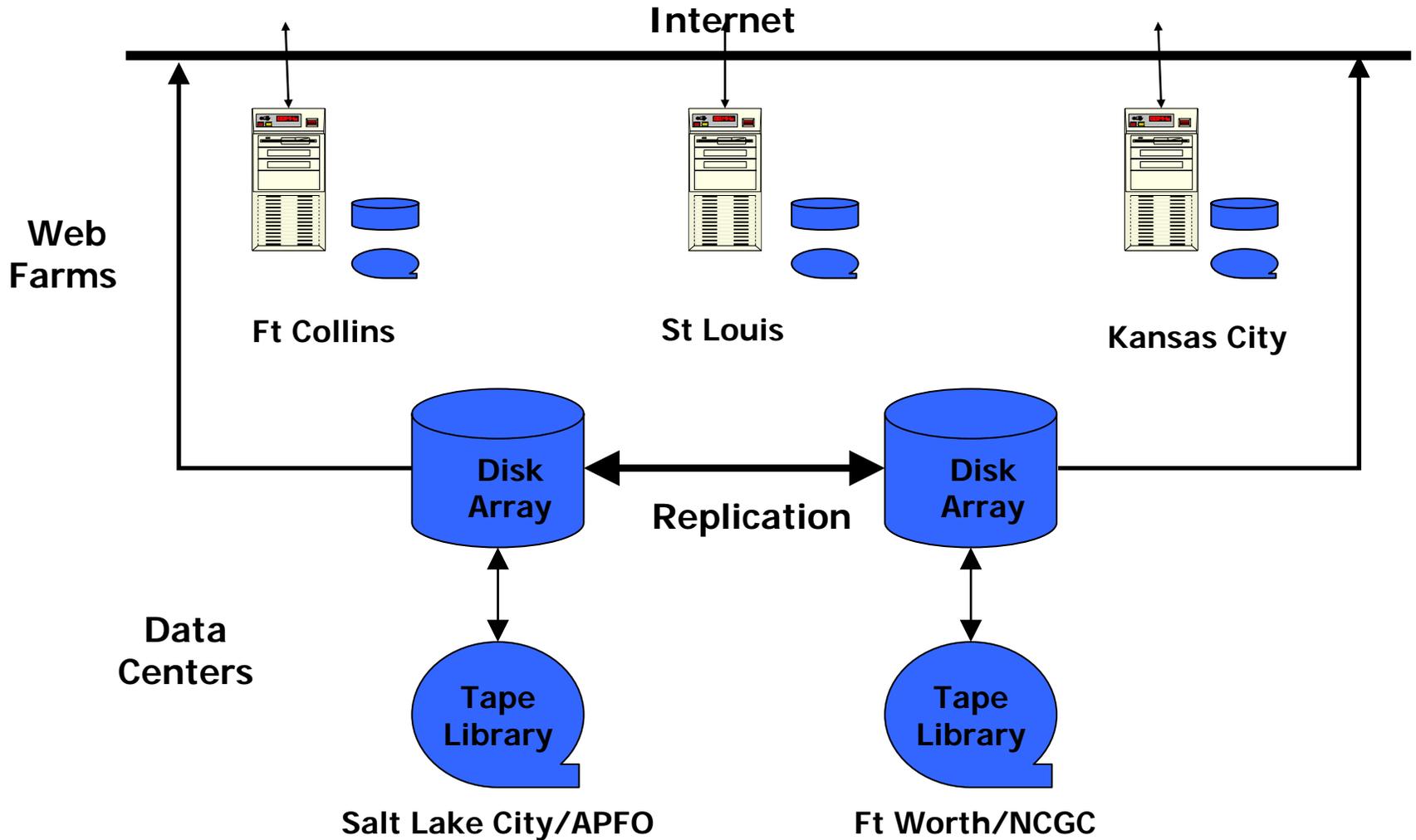
- Salt Lake City & Ft. Worth
- Geospatial Data Production Warehousing
- Data Delivery (CD-ROM, DVD, FTP, Portable Hard Drives)

● Three Web Farms/Data Marts

- Ft. Collins, Kansas City, & St. Louis
- Data Delivery for Web Applications
- High Availability, Secure Public Access
- ETL data from Data Centers to populate Data Marts
- Use web/map services to access Data Center data via authenticated proxy request from Web Farm

Field Service Center GIS

GDW Architecture



GDW Gear



NAIP Acquisition and Delivery Annual Cycle

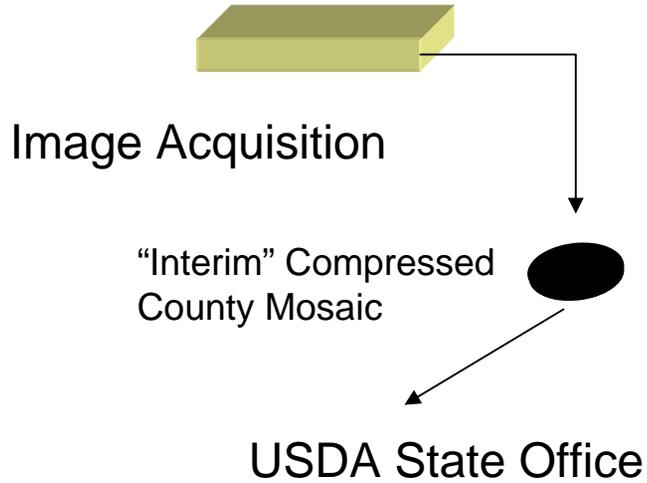
May | June | July | Aug | Sept | Oct | Nov | Dec | Jan | Feb | Mar | April | May



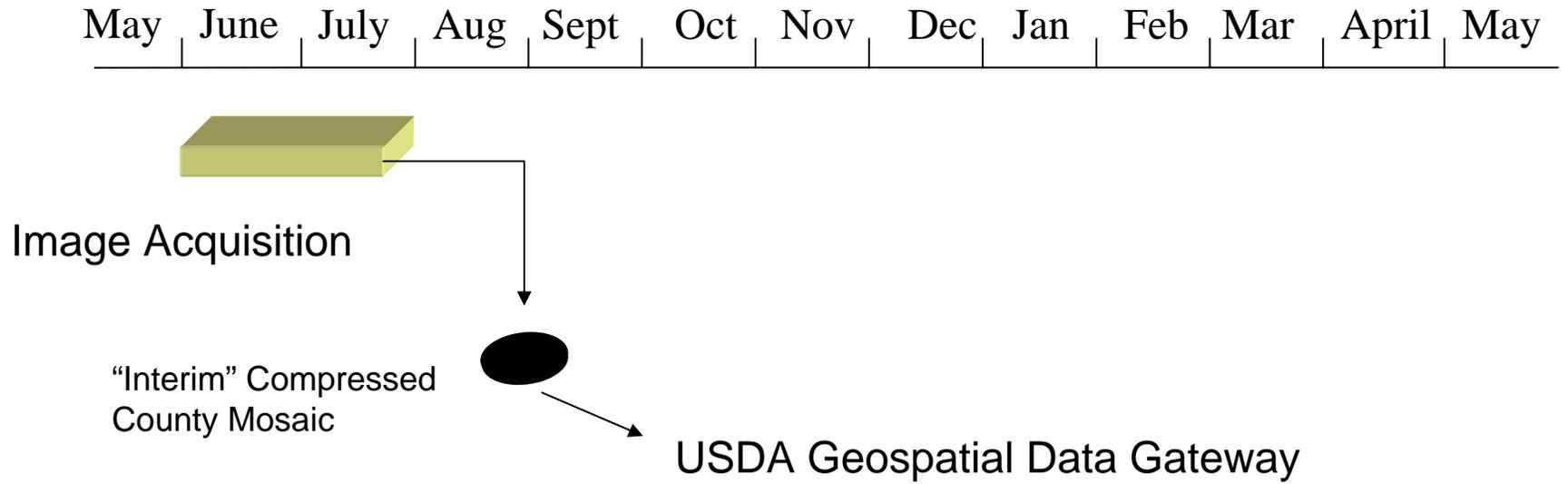
Image Acquisition

NAIP Annual Cycle

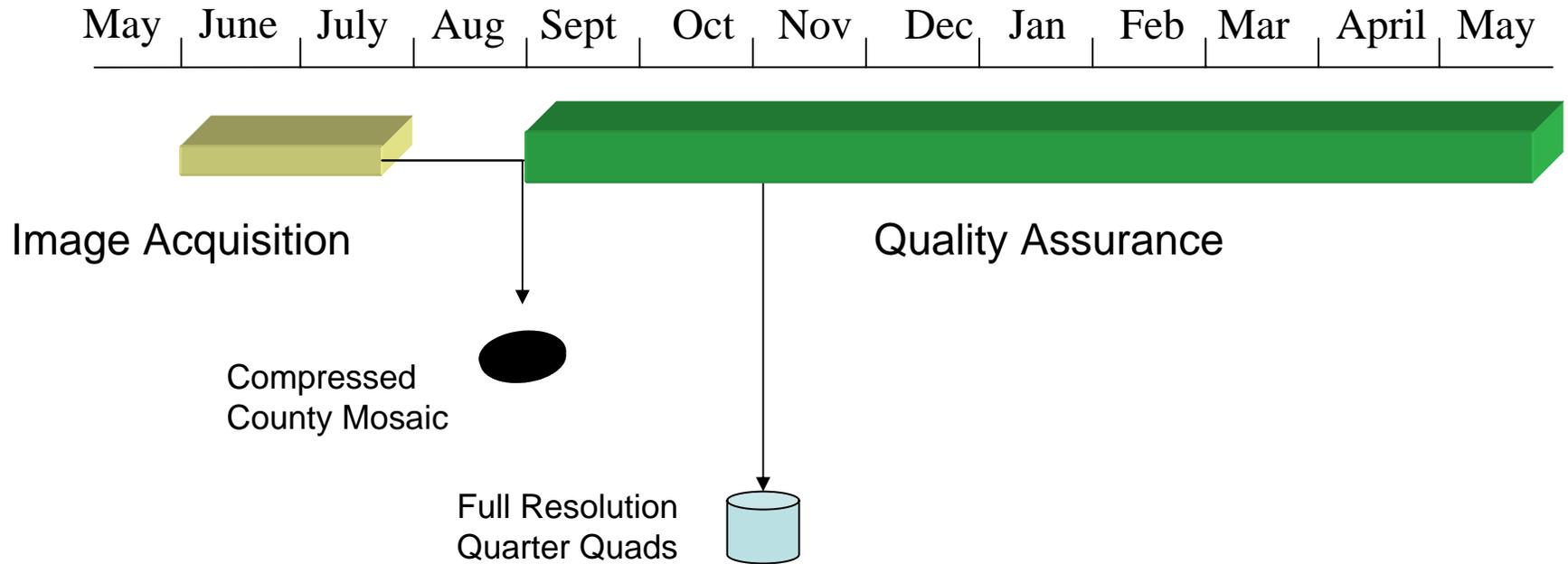
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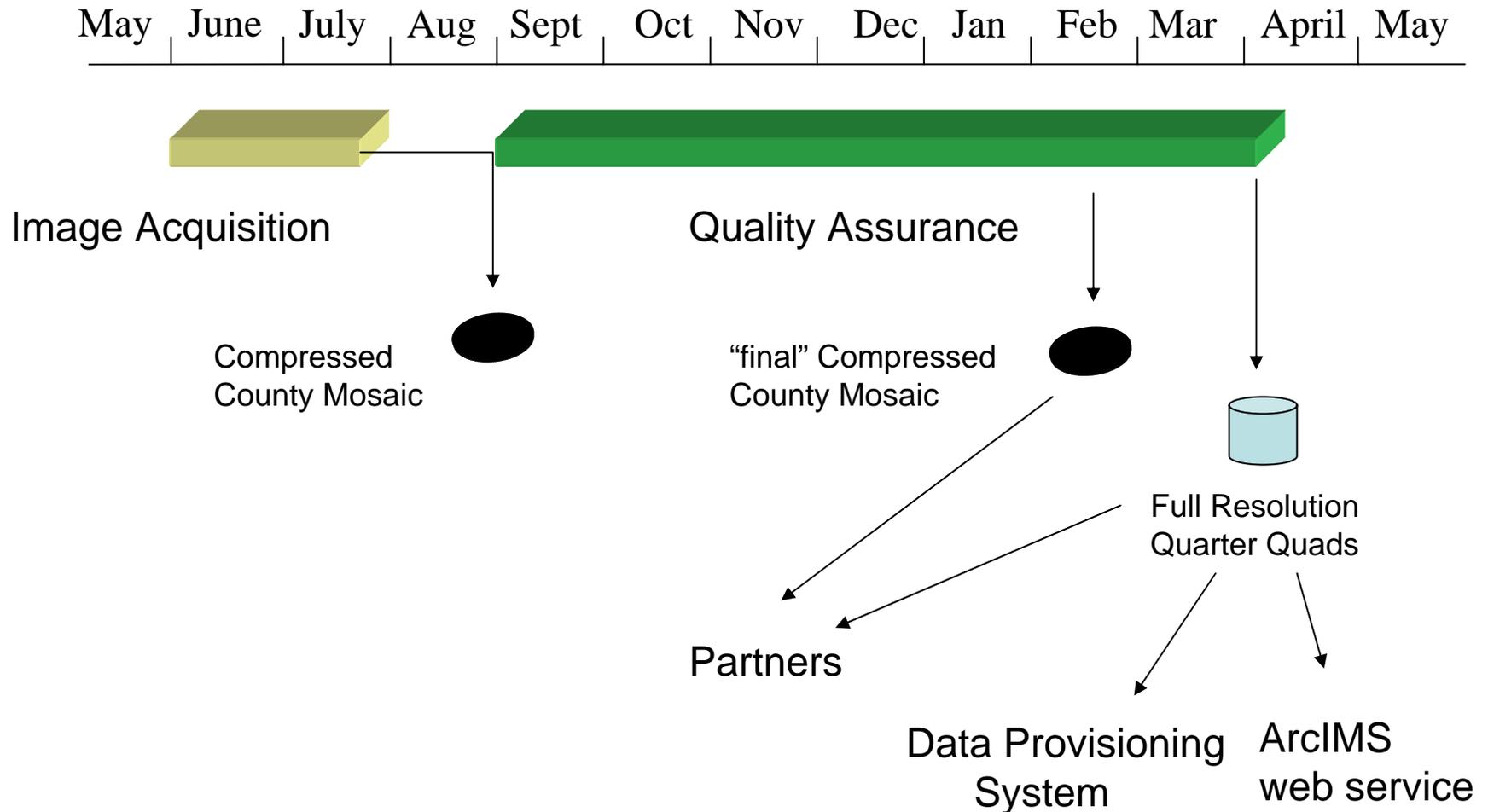
NAIP Annual Cycle



NAIP Annual Cycle



NAIP Delivery Timeline



Quality Assurance

- Purpose
 - Identify Problems with Image Products
 - That vendor can address through rework
 - Price reduction
 - Image quality Data Base
 - Vendor Performance
 - Improve Program
 - Product metadata

Challenges

- Funding
- Color quality issues
- Acquisition within FSA flying seasons
- Delivery/Access
- Horizontal Accuracy

Challenges

- Funding
 - Awards in April
 - Got it in 2006

Challenges

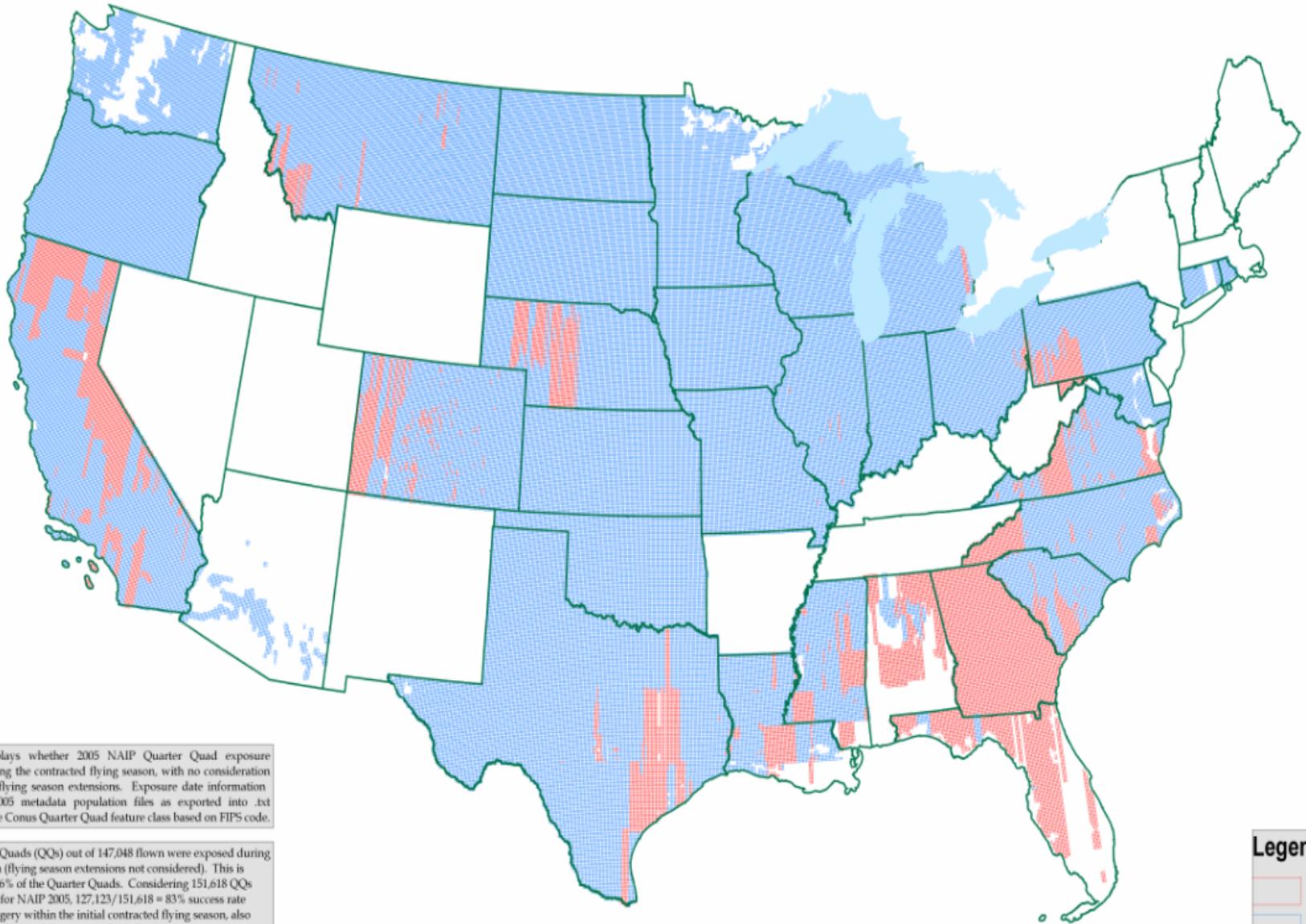
- Funding
- Color quality issues
 - Target image
 - Vendor visits
 - Image chain analysis
 - User requirements/perception

Challenges

- Funding
- Color quality issues
- Acquisition within FSA flying seasons

2005 NAIP - Were Exposure Dates During the Flying Season?

Contractual Flying Season Extensions Not Considered. Data Current as of 10 Nov 05



0 125 250 Kilometers

Challenges

- Funding
- Color quality issues
- Acquisition within FSA flying seasons
- **Delivery/Access**
 - Interim CCMs on gateway
 - CONUS by NAIP year on HDD
 - GDW
 - DPS

Challenges

- Funding
- Color quality issues
- Acquisition within FSA flying seasons
- Delivery/Access
- **CIR/RGB**
 - 4 band imagery
 - Requires digital camera

Challenges

- Funding
- Color quality issues
- Acquisition within FSA flying seasons
- Delivery/Access
- **Horizontal Accuracy**
 - Control for photogrammetric processing
 - Independent points for QA

Challenges

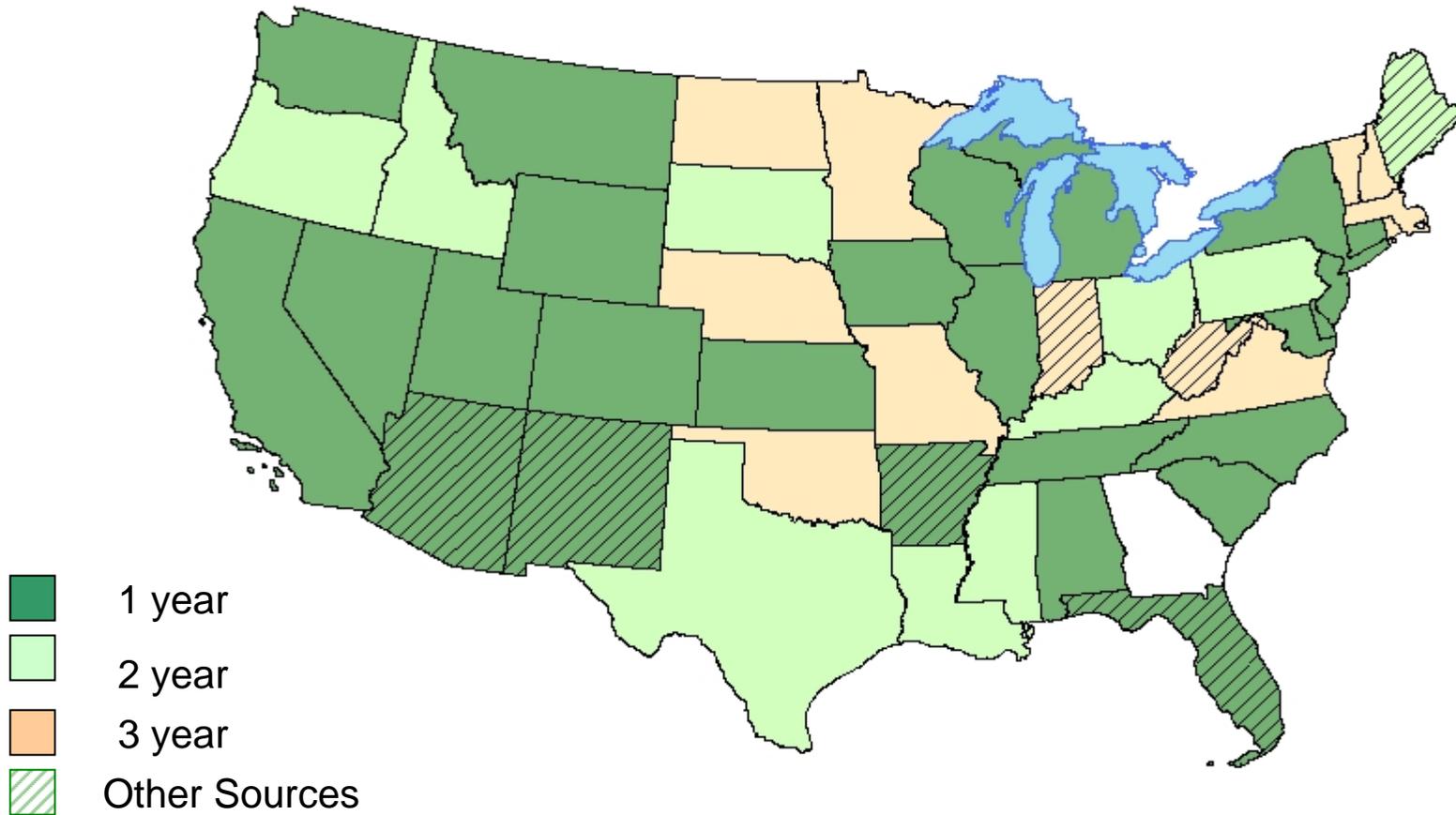
Horizontal Accuracy

- Control for photogrammetry
 - 2006 pilot project with state of Utah
 - Retain for future contracts
 - Likely to increase cost without state/local partners
- Independent points for QA
 - Partnerships
 - » USGS, state government
- Digital Elevation Models

Successes

- Coverage

Date of Ortho Image Base after 2006 NAIP Acquisition



Successes

- Coverage
- Price
 - \$150 QQ 2 meter
 - \$172/QQ 1 meter

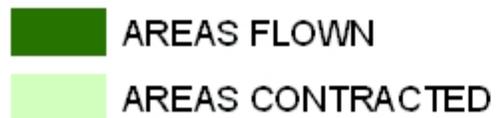
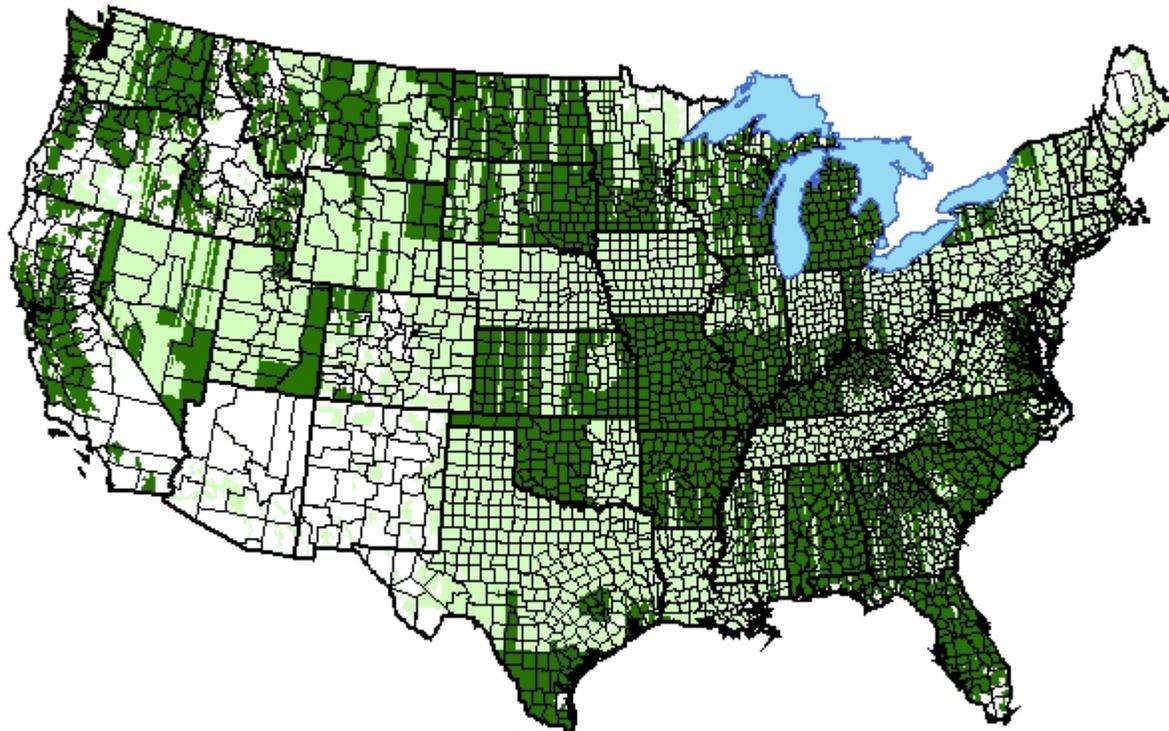
 - Compared with approximately \$800/QQ prior to NAIP

Successes

- Coverage
- Price
- Acquisition during peak crop growing season
 - Vendors stepping up
 - Large states split into multiple projects in 2006

2006 NAIP Imagery Status

July 18, 2006



Successes

- Coverage
- Price has stayed low
- Acquisition during peak crop growing season
- **Partnerships**
 - Cost share partners critical to success of NAIP

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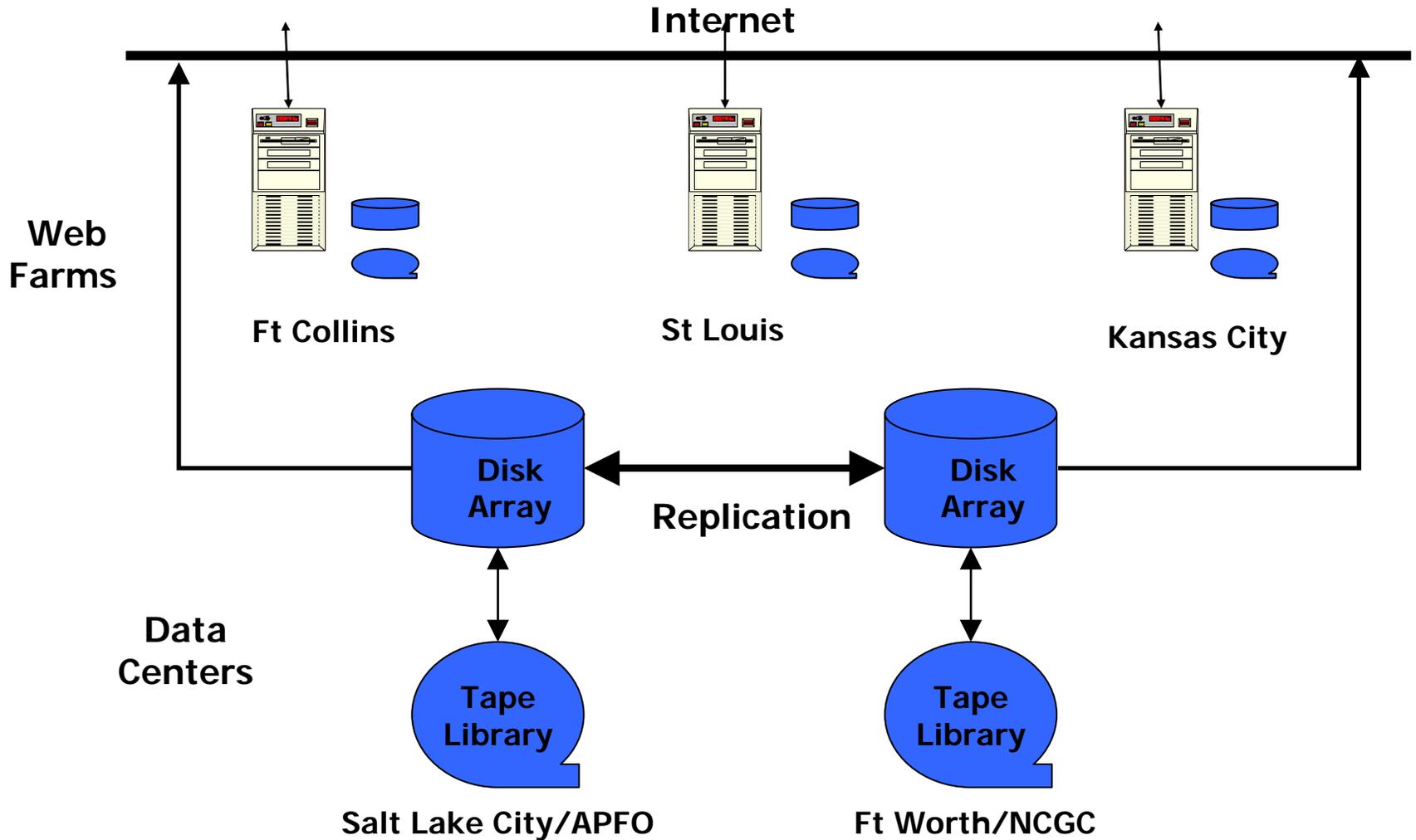
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Field Service Center GIS *GDW Architecture*



GDW Gear

