NAIP 2008: Issues and Enhancements

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NAIP 2008 Post Mortem

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Outline

- JPEG 2000 Compression
- Seamline Shapefile
- Absolute Control
- NAIP Survey

JPEG 2000

- Why switch to JPEG2000?
  - 4-band acquisition
    - 9 multi-spectral states (CT, IN, KS, MN, RI, TN, TX, VT, VA)
  - MrSID MG3 doesn't yet support compression of 4-bands
  - JPEG2000 is non-proprietary

JPEG 2000 Vs. MG3

- MG3
  - Doesn’t exhibit “blurriness”
  - Software compatible
  - Currently cannot handle a 4-band image
- JPEG2000
  - Non-proprietary
  - Multitude of settings
  - Issues may or may not be fixable
  - Support is somewhat limited

JPEG 2000 Issues

- Blurring
  - Many CCMs are exhibiting blurriness
  - Possible reasons
    - Settings
      - Code Blocks
      - Tile Parts
      - Tile Length Markers
      - Layers
    - Alpha channel issues
  - Fixes
    - Maximize values on above settings (ex. set tile length markers to “255”)
      - Could potentially increase file size
      - Could potentially affect actual compression ratio
      - Could potentially affect refresh rates
    - LizardTech has a patch that “may” correct blurring

JPEG 2000 Issues

- Imagery Disappearing at Certain Zoom Levels
  - Zoom scales larger than 1:30,000: image disappears or becomes a gray pixelation

JPEG 2000 Issues

- Rendering
  - CCMs over a certain size (8.5 billion pixels or ~3,200 sq/mi) will cause ArcGIS 9.1 (SP2) to fail
    - Reason for this is a known bug that ESRI will not fix
    - 9.2 fixes this problem
    - Current work-around is to split larger CCMs

JPEG 2000 Issues

- Viewing Difficulty in Different Software Applications
  - ArcView 3.x
    - Does not read JPEG2000 images
    - Some FSA county offices are still using ArcView
      - Requires GeoJP2 ArcView plug-in from LizardTech
  - ERMapper
    - Causes loading errors if ECW plug-in is installed
      - ArcGIS cannot read JPEG2000
    - Fix is to uninstall ECW plug-in
  - Global Mapper
    - “Patching” with distorted coloration

Seamline Shapefile

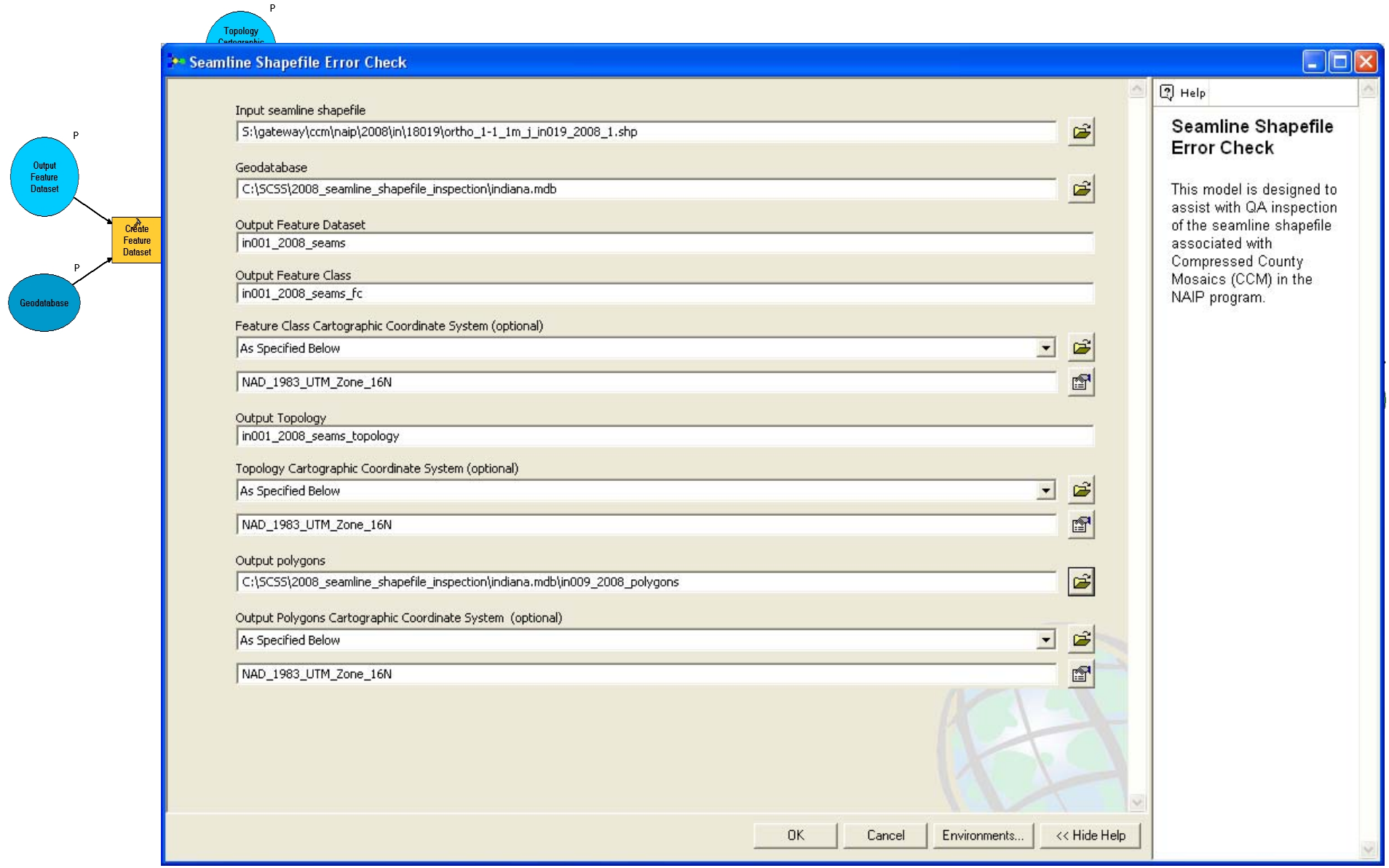
- Why switch to seamline?
  - More and more digital acquisitions
  - More accurate date and time representation of when a particular area is acquired
    - Parts of the imagery representing a standard DOQQ shapefile may have been collected on different dates
  - Seamlines provide an accurate boundary representation of imagery

Seamline Shapefile

- Pilot program in 2007 (Arizona)
- 6 states in 2008
  - IN, IA, KS, OK, TX, VA
- Contract requirements
  - Polygon for each exposure used to create CCM
  - No gaps in polygons
  - No overlapping polygons
  - No multiple part polygons
  - No polygons smaller than 40,470 square meters (~10 acres)
  - Data table attributed correctly for each polygon
  - Shapefile coverage represents the extents of the visible imagery

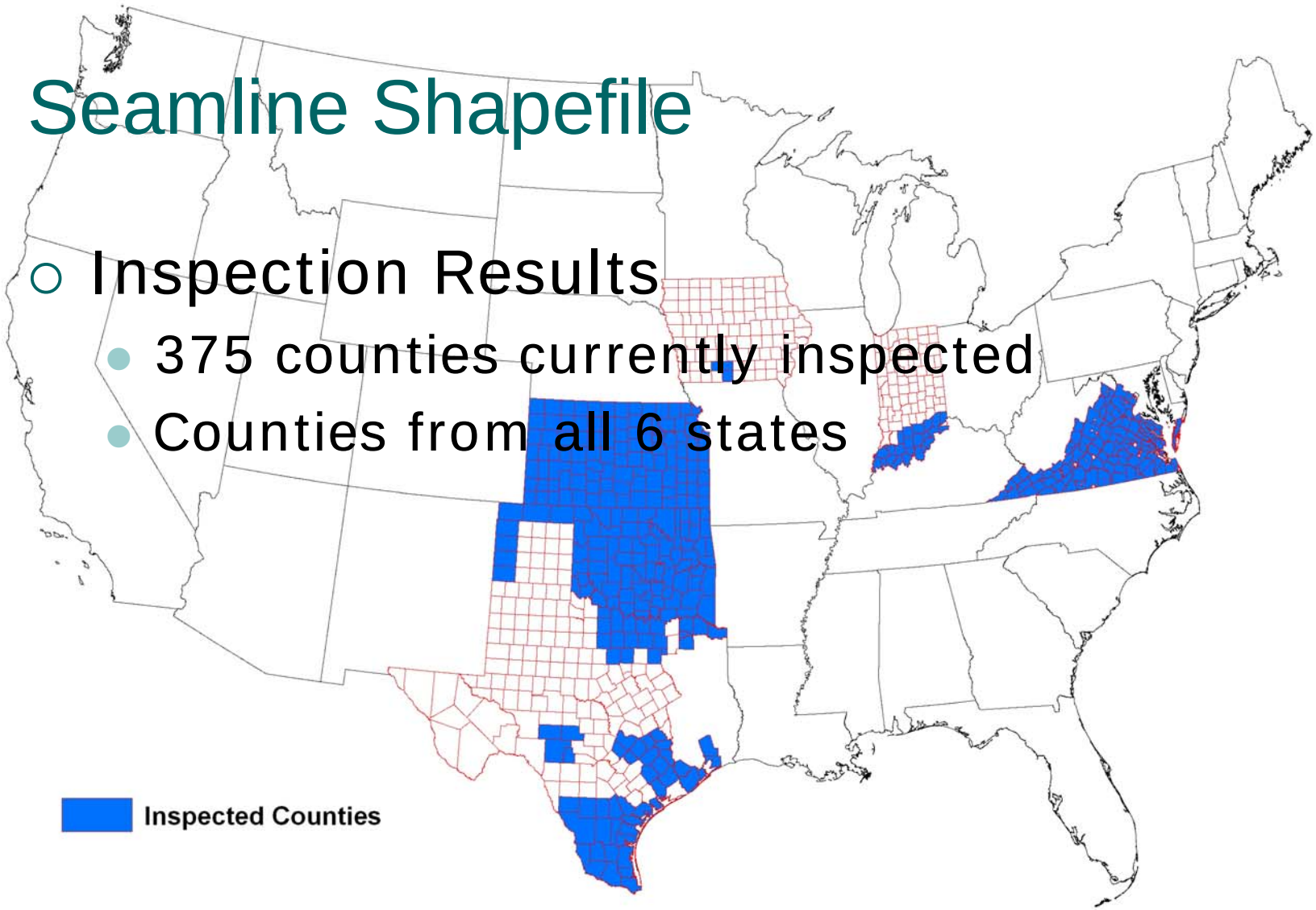
Seamline Shapefile

- Why is it important to meet contract requirements?
  - Allows for precise identification of when a particular area was acquired
  - Consistent and accurate data is important to the integrity of NAIP


Topology
Seamline Shapefile Error Check
Input seamline shapefile
S:\gateway\ccm\naip\2008\in\18019\ortho_1-1_1m_j_in019_2008_1.shp
Geodatabase
C:\SCSS\2008_seamline_shapefile_inspection\indiana.mdb
Output Feature Dataset
in001_2008_seams
Output Feature Class
in001_2008_seams_fc
Feature Class Cartographic Coordinate System (optional)
As Specified Below
NAD_1983_UTM_Zone_16N
Output Topology
in001_2008_seams_topology
Topology Cartographic Coordinate System (optional)
As Specified Below
NAD_1983_UTM_Zone_16N
Output polygons
C:\SCSS\2008_seamline_shapefile_inspection\indiana.mdb\in009_2008_polygons
Output Polygons Cartographic Coordinate System (optional)
As Specified Below
NAD_1983_UTM_Zone_16N
OK
Cancel
Environments...
<< Hide Help
Help
Seamline Shapefile Error Check
This model is designed to assist with QA inspection of the seamline shapefile associated with Compressed County Mosaics (CCM) in the NAIP program.
Output Feature Dataset
Create Feature Dataset
Geodatabase

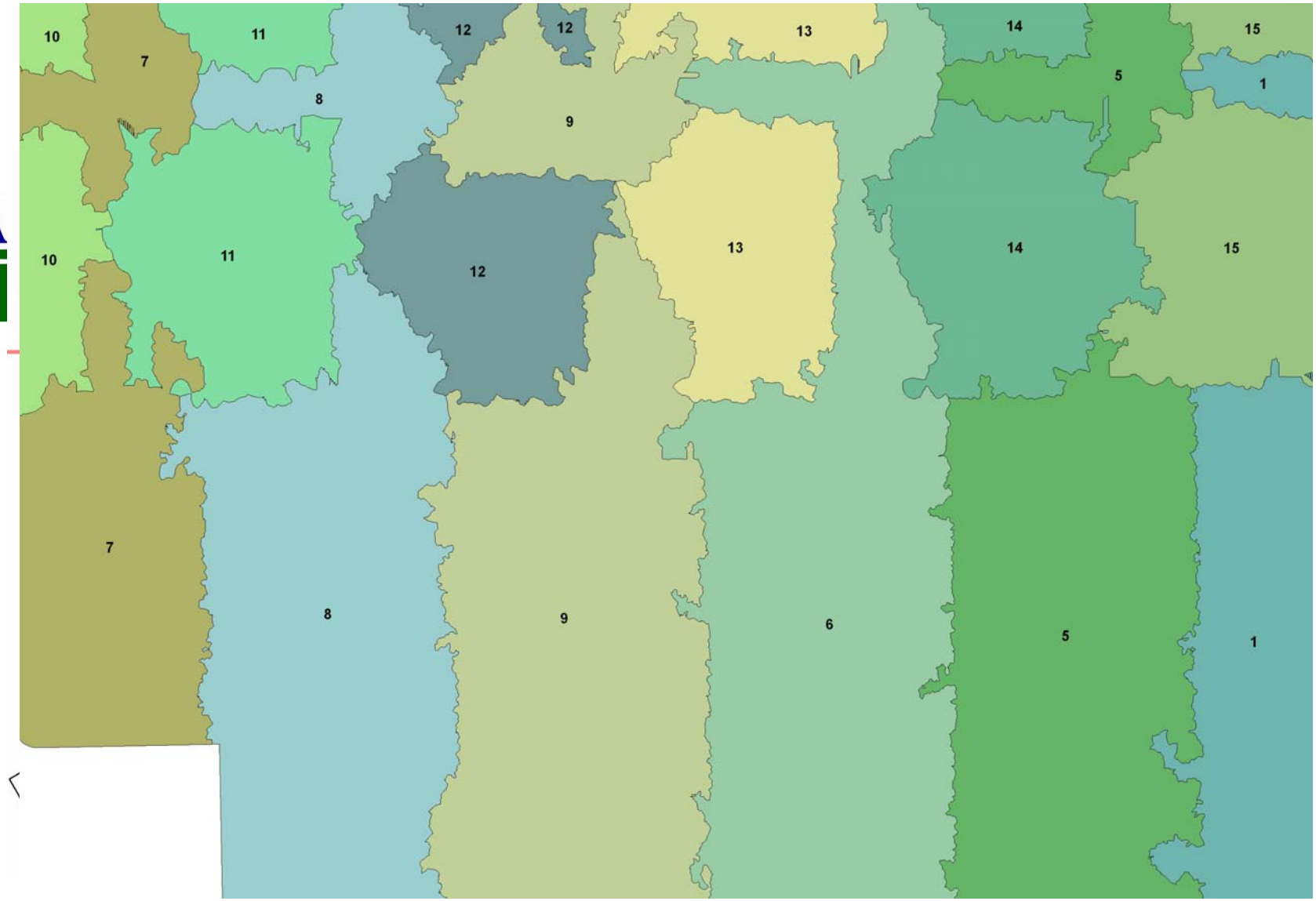
Seamline Shapefile

- Inspection Results
  - 375 counties currently inspected
  - Counties from all 6 states



Seamline Shapefile

- Errors
  - **5** counties did not have adequate coverage
  - **66** counties with overlap errors
  - **48** counties with gap errors
  - **36** counties with multi-part polygons
  - **43** counties with polygons under 40,470 square meters



Polygons

Absolute Control

- Why absolute?
  - Less manipulation of vector data (CLU) over time to “match” base layer (imagery)
  - Imagery is used as a base layer in GIS
  - A more accurate dataset is a more valuable dataset over time
  - Doesn’t use errors and offset from former imagery
  - Imagery would match most other data sets
  - Absolute accuracy is a better, more understandable specification

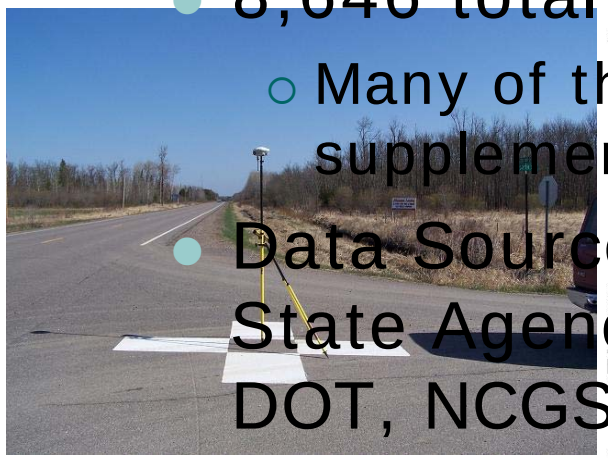
Absolute Control

- Migration from relative horizontal accuracy to absolute horizontal accuracy
  - Began as a pilot program
    - Utah in 2006; Arizona 2007
  - Working toward a nationwide photo-identifiable control database
    - Control points are strictly for the APFO QA of NAIP imagery
    - Points are not releasable to the general public

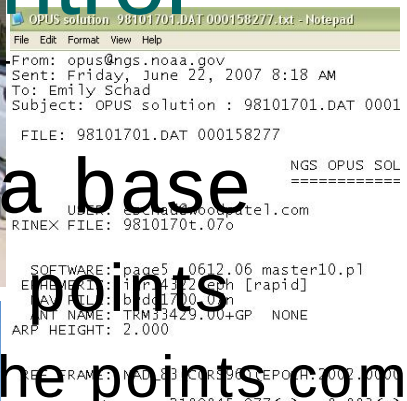
Absolute Control

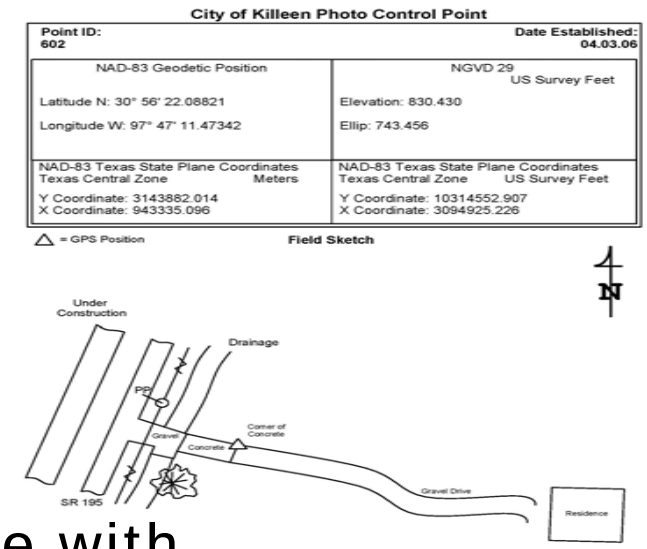
- NAIP 2008 Control Point Acquisition
  - 7 states (IN, MN, NH, NC, TX, VT, VA)
  - Coordination in APFO Service Center Support Section
    - Began in January 2008
    - Telecons with local-level (FSA, USGS, and state-level) personnel to facilitate acquisition
  - Control points are received, checked, and data based at APFO

Absolute Control

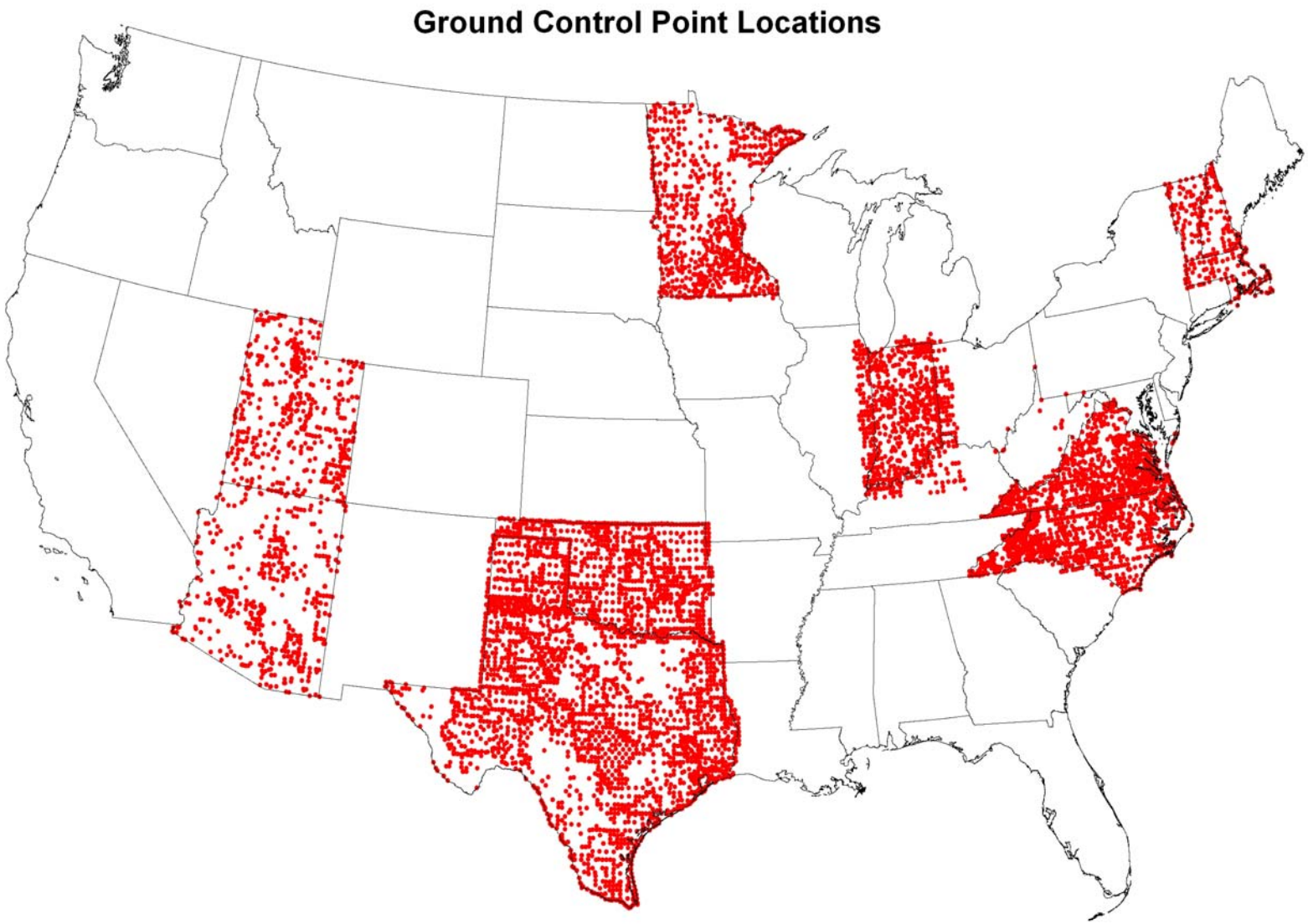


Example Supplemental Data





- Current data base
  - 8,646 total points
    - Many of the points come with supplemental data
  - Data Sources: USGS, USFS, NGS, State Agencies – TNRIS, Minnesota DOT, NCGS, IndianaDOT, VirginiaITA


Ground Control Point Locations

Absolute Control

- NAIP 2009
  - All states will be absolute control
  - Coordination will again be in APFO Service Center Support Section

NAIP Survey

- Purpose
  - Excellent measure of how well NAIP is serving the customer
  - Gives FSA a chance to respond with concerns, satisfaction, etc.
- NAIP 2008 survey should be released February 2009
- Results of 2007 survey are available
  - http://www.apfo.usda.gov/
  - Click on “Imagery Programs”, then “NAIP Survey”