



Statewide Orthoimagery 2010 Data Delivery

Center for Geographic Information and Analysis
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April 2011



Today



1. Introductions
2. Project overview
3. Quality Control
4. Portable drive contents
5. Technical notes
6. Process for reporting imagery problems
7. Expectations for data sharing
8. Online access: NC OneMap
9. Hand-off and next steps



Project In Brief

- City of Durham PSAP
- Funded by NC 911 Board
- 100 counties
- Flights – early 2010
- Imagery to counties – early 2011
- 59,000 “tiles”
- 6-inch ground resolution





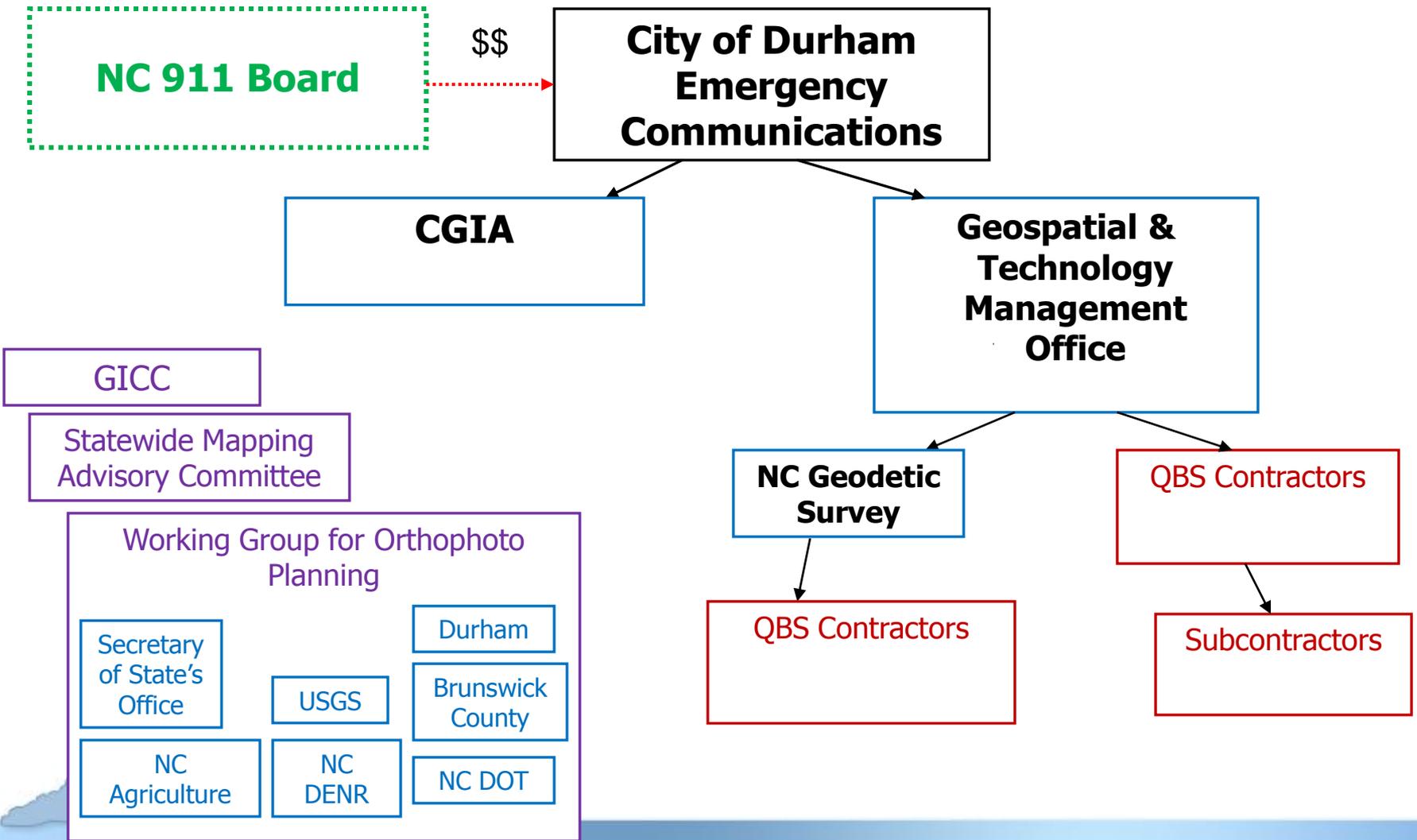
Brief History

- NC GICC – Imagery Task Force
 - Value for 911, EM, GIS applications
 - Vision, initiative, benefits
- Cost-share with USGS and Floodplain Mapping
- NC 911 Board and City of Durham
 - Opportunity / resources in place
 - Collaboration – public and private



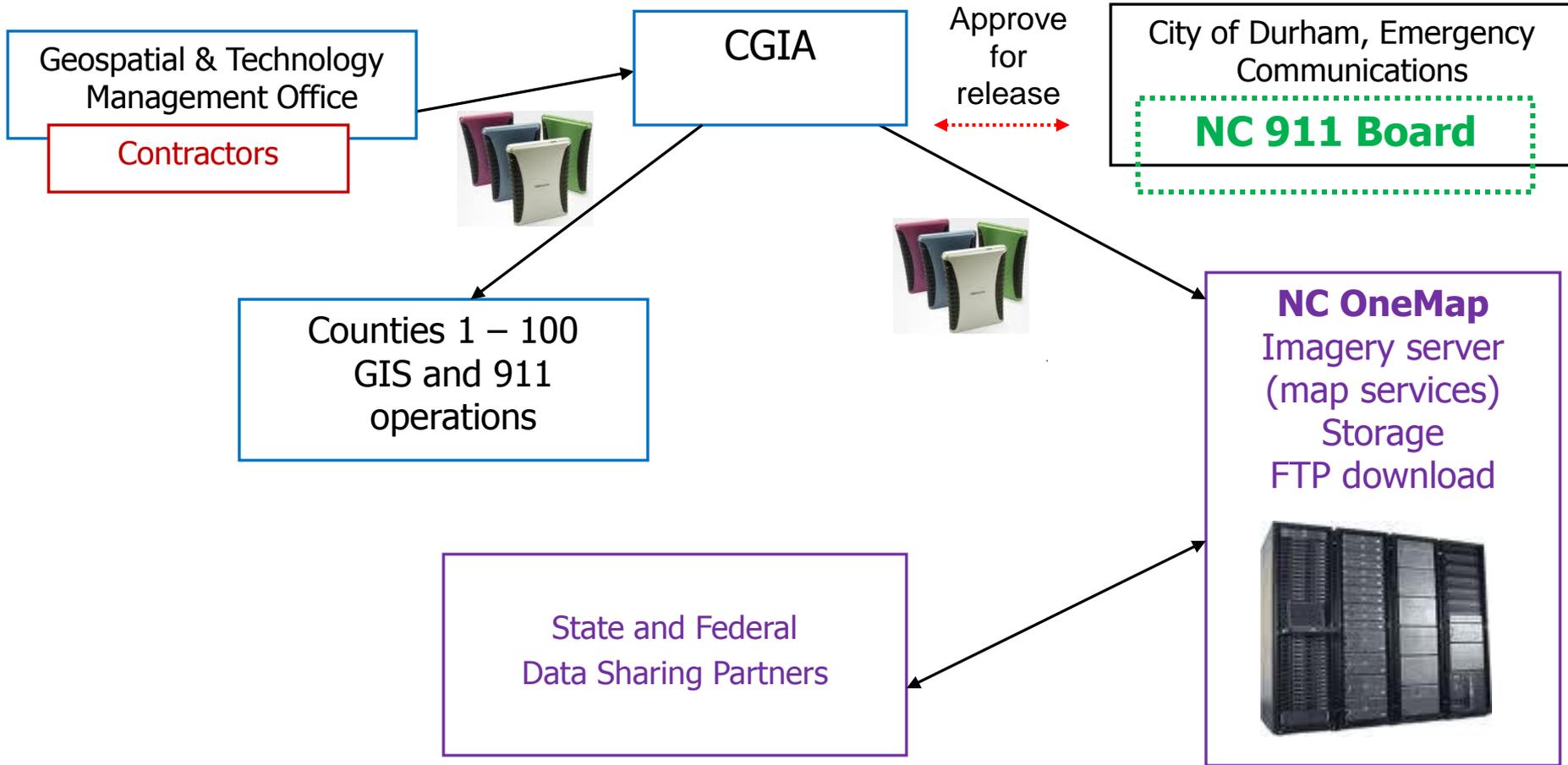


Collaboration for Statewide Project

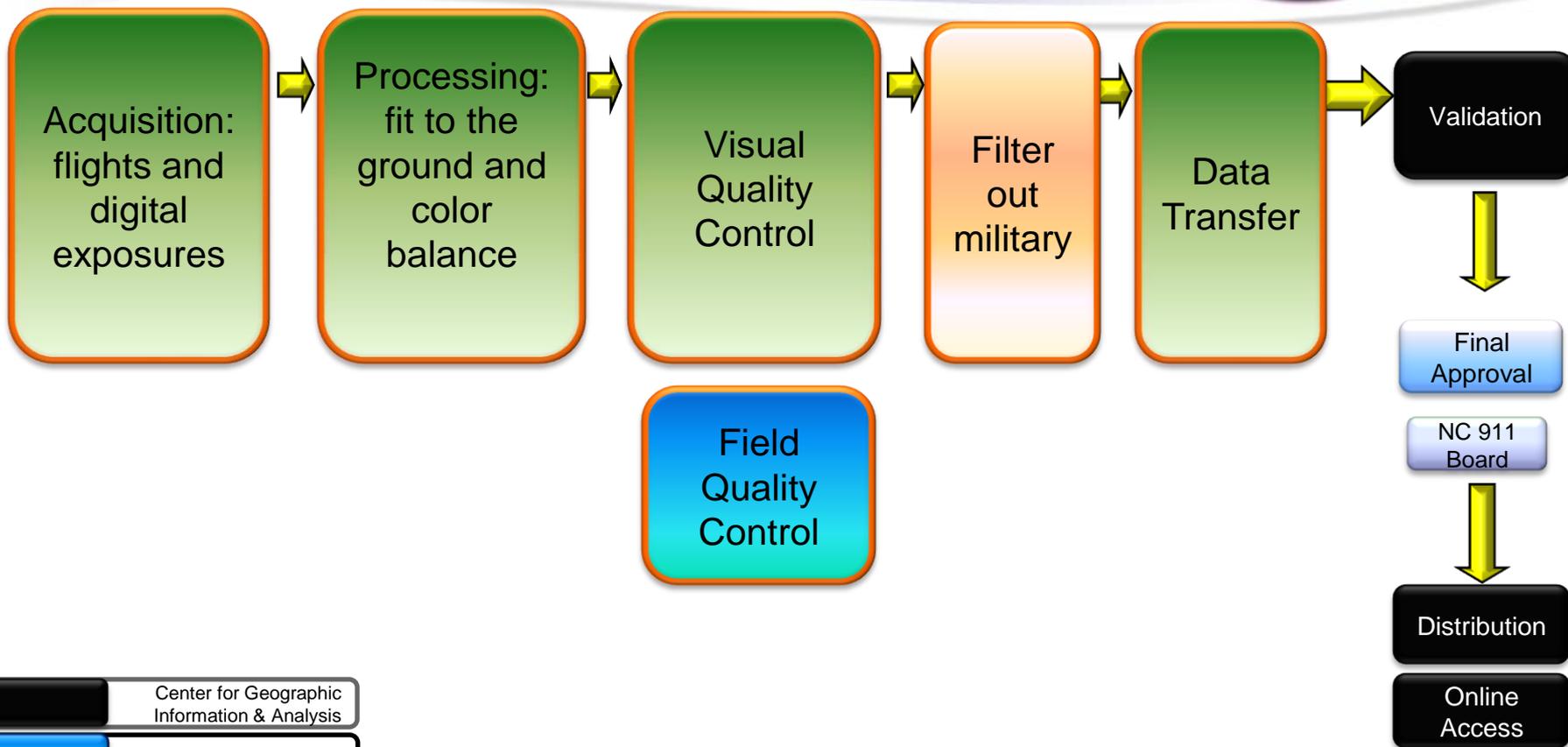




Distributing Imagery Products



Overview of Process Steps



- Center for Geographic Information & Analysis
- NC Geodetic Survey
- Geospatial & Technology Management office
- North Carolina 911 Board

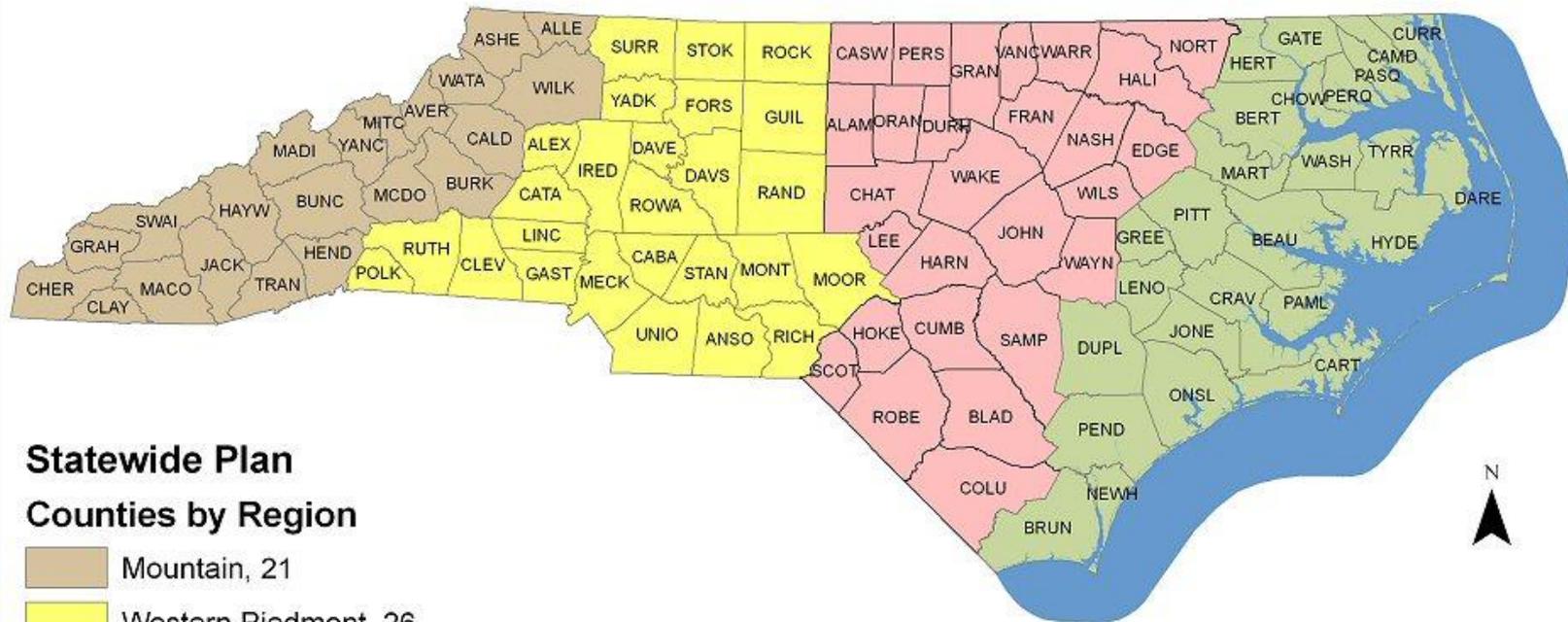
**City of Durham,
Emergency
Communications**

**Grant
Management**



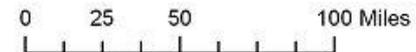
North Carolina Orthoimagery

Proposed Regions for Orthoimagery Acquisition 2010



Statewide Plan Counties by Region

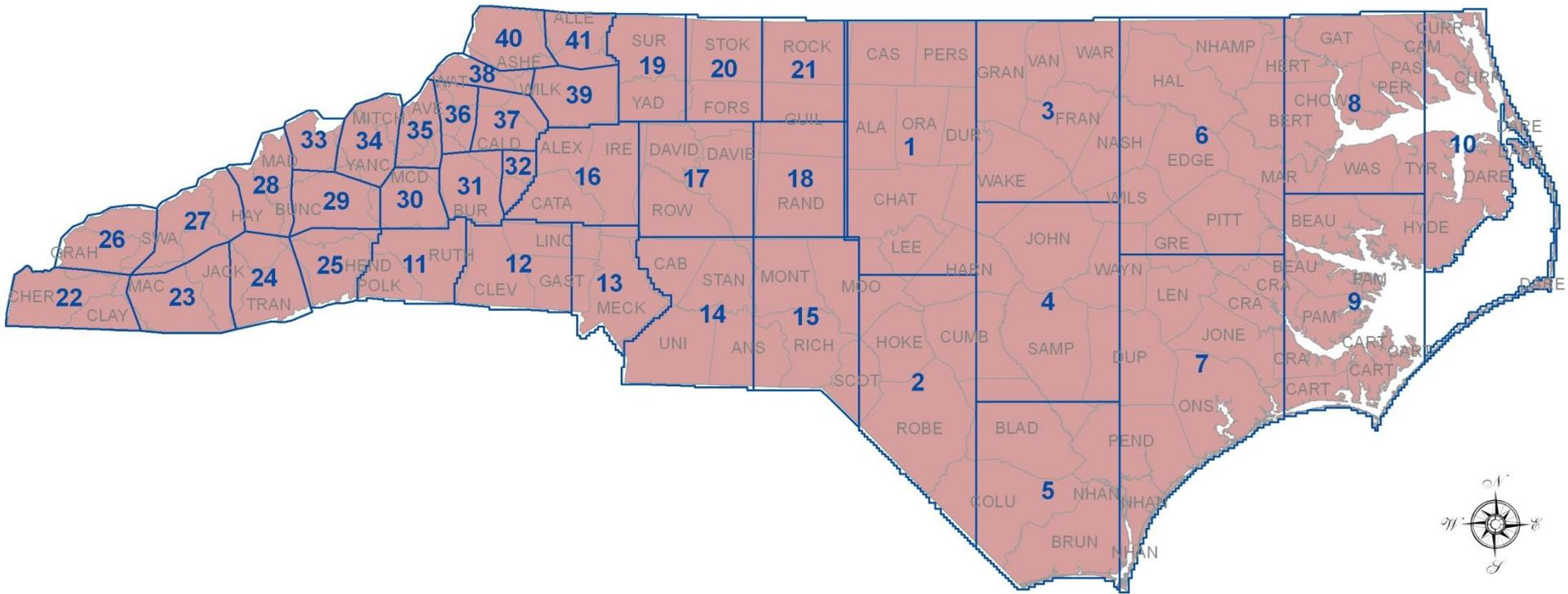
- Mountain, 21
- Western Piedmont, 26
- Eastern Piedmont, 27
- Coastal Plain, 26
- Coastal Water



Note: regional assignments from the Statewide Orthoimagery 2010 project team, November 4, 2009



Blocks for Aerial Triangulation and Processing



Legend

-  ESP_AT_Blocks
-  FinalATBlocks
-  BOUNDARY_CountyOutlines



Quality Control



- Aerial triangulation
- Visual quality
- Positional accuracy
- Validation and acceptance



Aerial Triangulation QC



- Third party contractor – AECOM
- Verify AT reports





Visual QC

- Third party quality control – AECOM
- Selected tiles
- Attention to edges of regions (four processing contractors)
- Expectations



Visual Quality Control



Areas of great importance

- Transportation
- Major bridges
- Urban areas
- No seam lines cutting buildings or large structures
- Areas of state importance
- Color and contrast well balanced at seam edges between contractors

Areas of least importance

- Highly vegetated areas
- Water bodies (color and seam lines)
- Utility lines above the ground

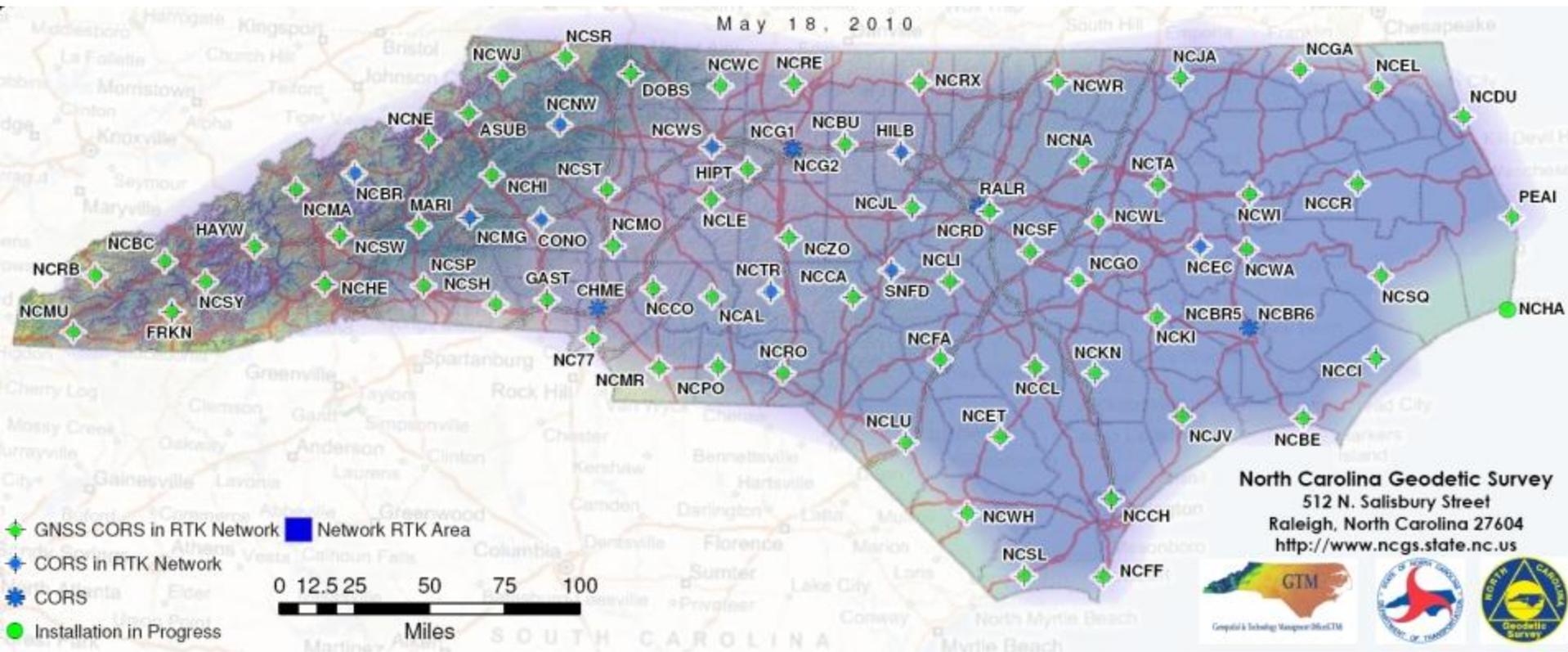


Positional Quality Control

- Ground control points
- Continuously Operating Reference Stations



Continuously Operating Reference Stations





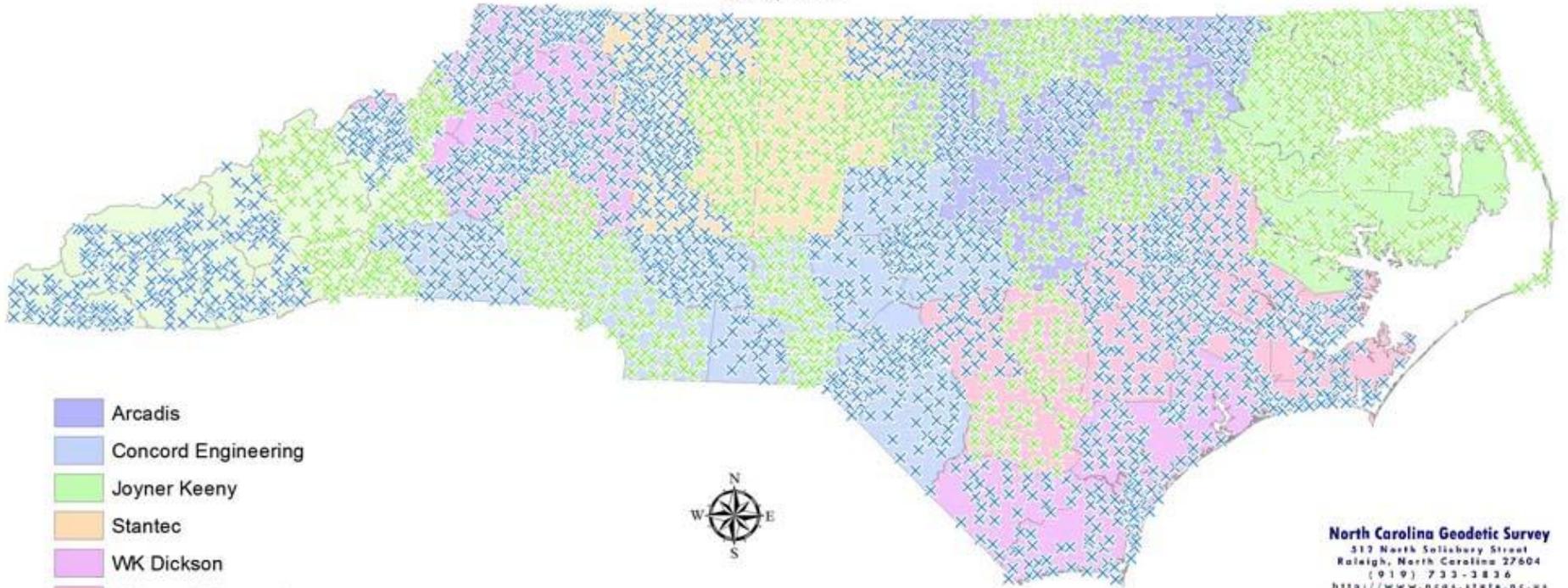
Positional Quality Control

- Photo identifiable points
- Field survey of the points
- Statistical report on accuracy



Aerial Imagery Quality Control Checkpoint Status

February 1, 2011



- Arcadis
- Concord Engineering
- Joyner Keeny
- Stantec
- WK Dickson
- Withers & Ravenel
- Woolpert



North Carolina Geodetic Survey
512 North Salisbury Street
Raleigh, North Carolina 27604
(919) 733-3836
<http://www.ncgs.state.nc.us>



2010 Imagery QC Reports

Folder	# of Folders	# of Documents	Action
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Showing 0 results.

Documents

Search

Search this Folder

647x547

Showing 1 - 25 of 78 results.

Items per Page **5** Page **1** of 4 [First](#) [Previous](#) [Next](#) [Last](#)

Name	Size	Downloads	Locked	
 Anson_final_summary.pdf	126.8k	2	No	 View
 Beaufort_final_summary.pdf	143.8k	0	No	 View
 Bertie_final_summary.pdf	133.5k	0	No	 View
 Bladen_final_summary.pdf	92.8k	0	No	 View
 Buncombe_final_summary.pdf	232.8k	0	No	 View

Verification and Packaging



- Copy and validate
- Inspect 5 percent of tiles, in targeted areas
- Resolve issues
- Finalize metadata
- Compile final package



Portable Drive Contents



- README
- Full resolution TIFF imagery tiles
- Compressed MrSID imagery tiles
- Compressed MrSID for all adjacent counties
- County mosaics for county and adjacent counties
- Metadata
- Index files
- Catalog Tool
- Other Information





Technical Notes

- NC Technical Specifications
- Tile Naming
- Projections and GIS
- Mosaics
- Elevation



NC Specifications



“NC Technical Specifications for Digital Orthophoto Base Mapping” from Land Records Management Program in the Secretary of State’s Office (2009):

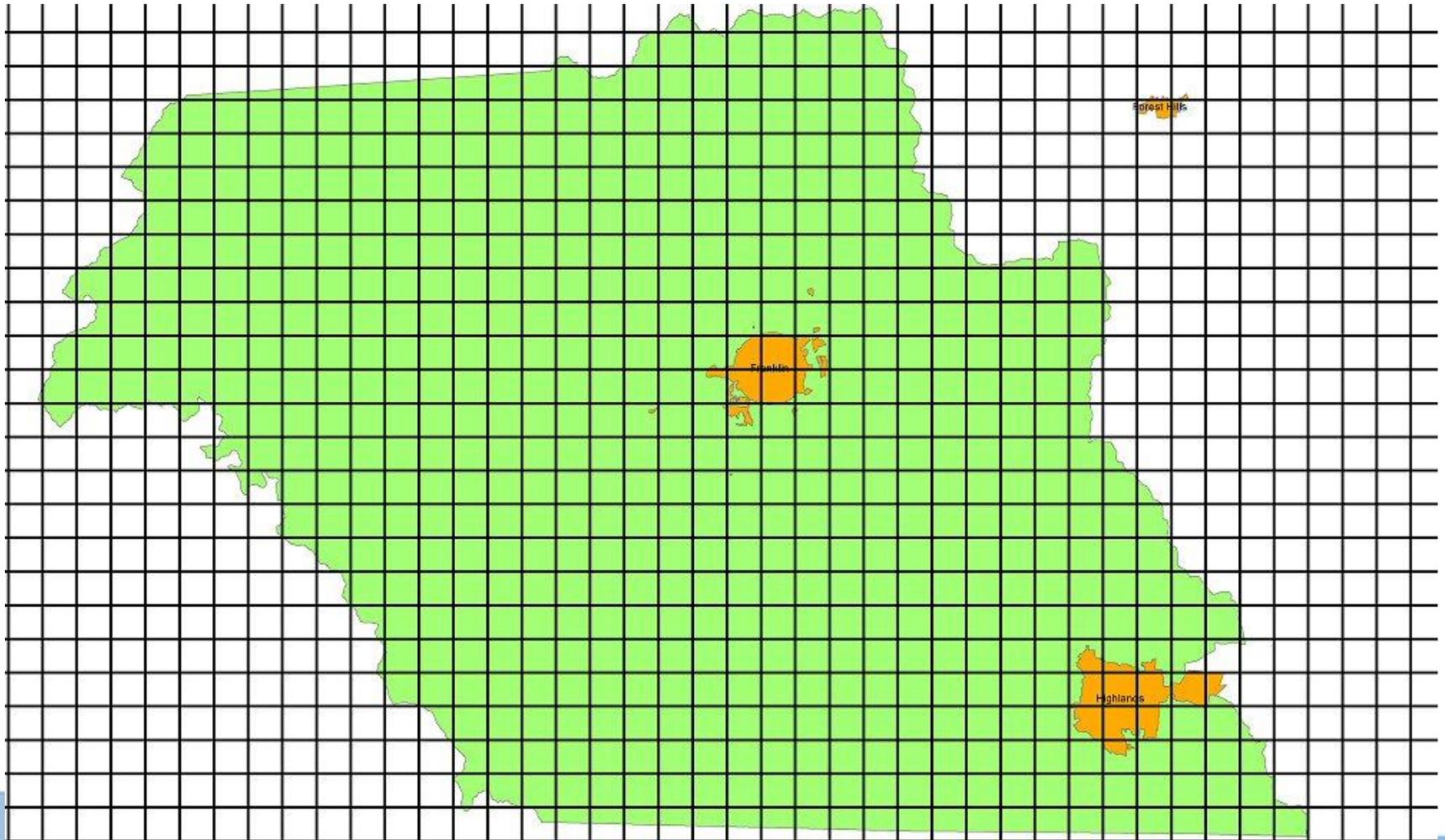
- Methods
- Formats
- Quality and accuracy
- Reports certified by surveyor licensed in NC



Grid



- Statewide grid 5,000' by 5,000'



Tile Naming



OC6i0_37_000_20765400_20100601R0

- **OC** - 2 digit product code: O= orthoimagery, C = color. Other product codes OB (B&W), OR (Infrared), DE (DEM)
- **6i0** – 3 digit pixel size: Use the unit indicator code (i = Inch, f = Foot, m = Meter, c = Centimeter) as the decimal point. 6 Inch = 6i0, 1.5 feet = 1f5, 1.5 meter = 1m5, 15 centimeters = 15c. Note the unit indicator code is always lower case.
- **37** – 2 digit NC ANSI (FIPS) Code
- **000** – 3 digit alphanumeric custodian code. For county maintained data this would be county ANSI (FIPS) code, 000 for statewide, or city code (RAL), or agency code (DOT)
- **20765400** – Map Index Number -8 digit SOS LRM Numbering of the Basic Modular Unit with Millionth place digit.
- **20100601R0** – 10 digit tile project date (YYYYMMDD)(RN)
RN=revision number, 0 is no revisions, R1,R2, etc to be used as needed.
- Additional user generated info can be appended at the **END** of the file name; an Underscore will be used between the date field and the additional information.





Projections and GIS

- NC State Plane Coordinate System, NAD83 (NSRS2007) feet
- Data Frame
- ESRI 10.x and 9.x
- Image Catalog

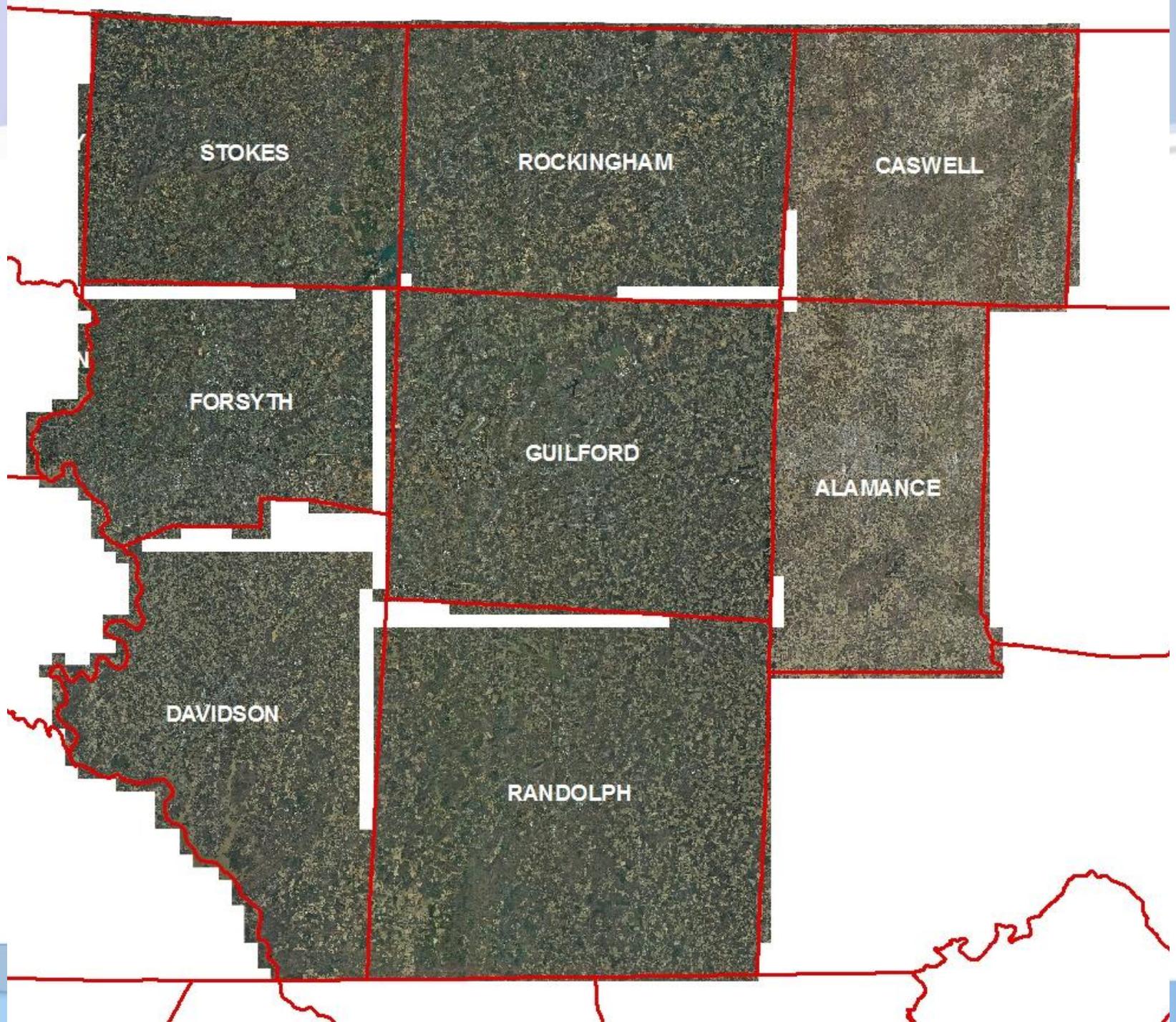


Mosaics



- Mosaics
 - All tiles combined (MrSID) 50:1
 - County
 - Adjacent counties
 - Displaying multiple counties





STOKES

ROCKINGHAM

CASWELL

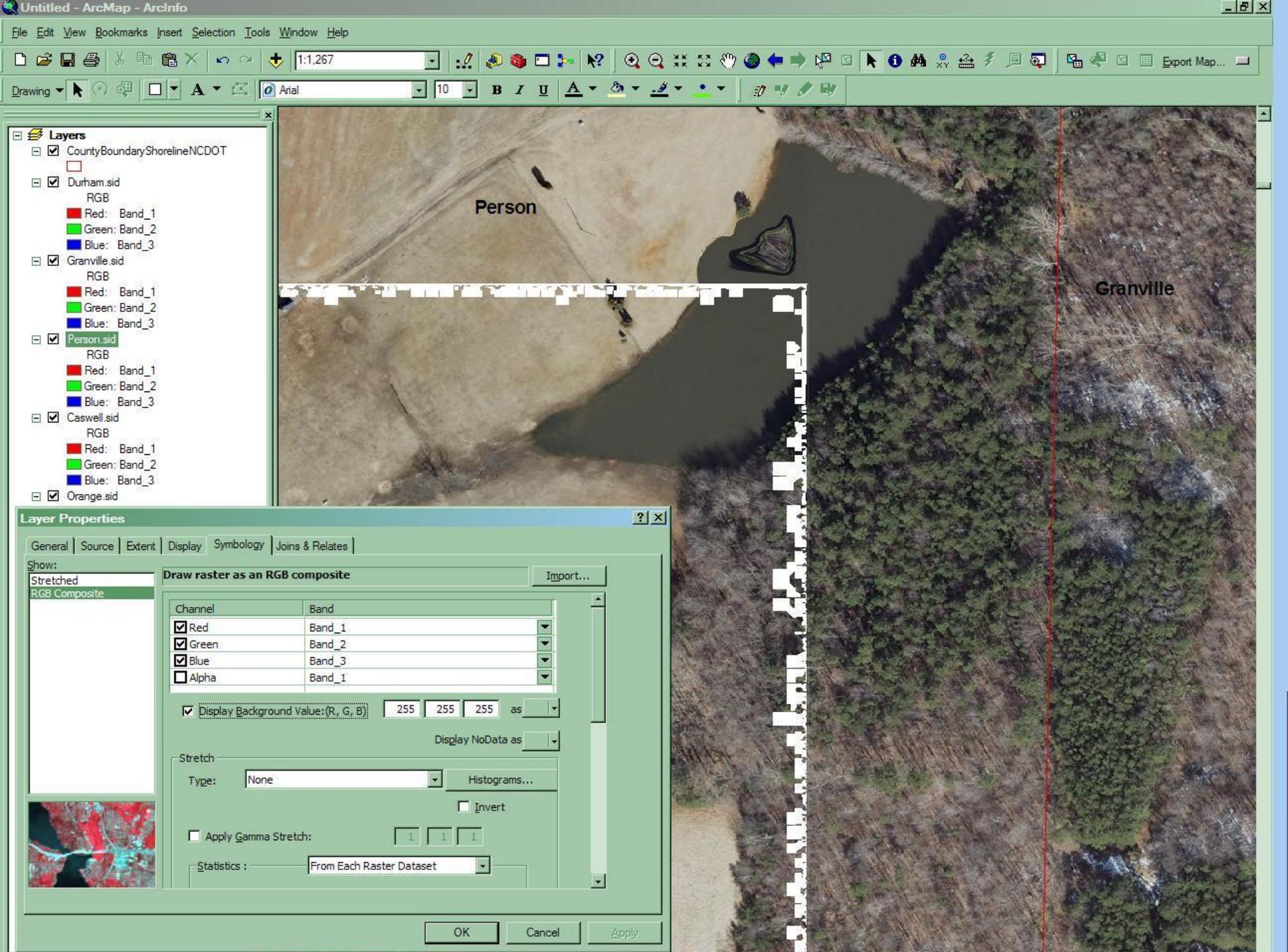
FORSYTH

GUILFORD

ALAMANCE

DAVIDSON

RANDOLPH



- Layers
 - CountyBoundaryShorelineNCDOT
 - Durham.sid
 - RGB
 - Red: Band_1
 - Green: Band_2
 - Blue: Band_3
 - Granville.sid
 - RGB
 - Red: Band_1
 - Green: Band_2
 - Blue: Band_3
 - Person.sid
 - RGB
 - Red: Band_1
 - Green: Band_2
 - Blue: Band_3
 - Caswell.sid
 - RGB
 - Red: Band_1
 - Green: Band_2
 - Blue: Band_3
 - Orange.sid



Layer Properties

General Source Extent Display Symbology Joins & Relates

Show:
Stretched
RGB Composite

Draw raster as an RGB composite

Channel	Band
<input checked="" type="checkbox"/> Red	Band_1
<input checked="" type="checkbox"/> Green	Band_2
<input checked="" type="checkbox"/> Blue	Band_3
<input type="checkbox"/> Alpha	Band_1

Display Background Value: (R, G, B) 255 255 255 as
Display NoData as

Stretch
Type:
 Invert

Apply Gamma Stretch:

Statistics:



Elevation

- All digital elevation models for orthorectification were based on LIDAR
 - Geospatial and Technology Management Office
 - Available for download

<http://floodmaps.nc.gov/fmis/Download.aspx>



Is the imagery flawless?



- Contractors: 25 percent of tiles inspected
- CGIA: 5 percent of tiles inspected (focus on transportation and urban cores)
- 70-75 percent not inspected unless a systematic problem in the sample
- Positional accuracy from sample points



Expectations for Project



Areas of great importance

- Transportation
- Major bridges
- Urban areas
- No seam lines cutting buildings or large structures
- Areas of state importance
- Color and contrast well balanced at seam edges between contractors

Areas of least importance

- Highly vegetated areas
- Water bodies (color and seam lines)
- Utility lines above the ground



What is a flaw?

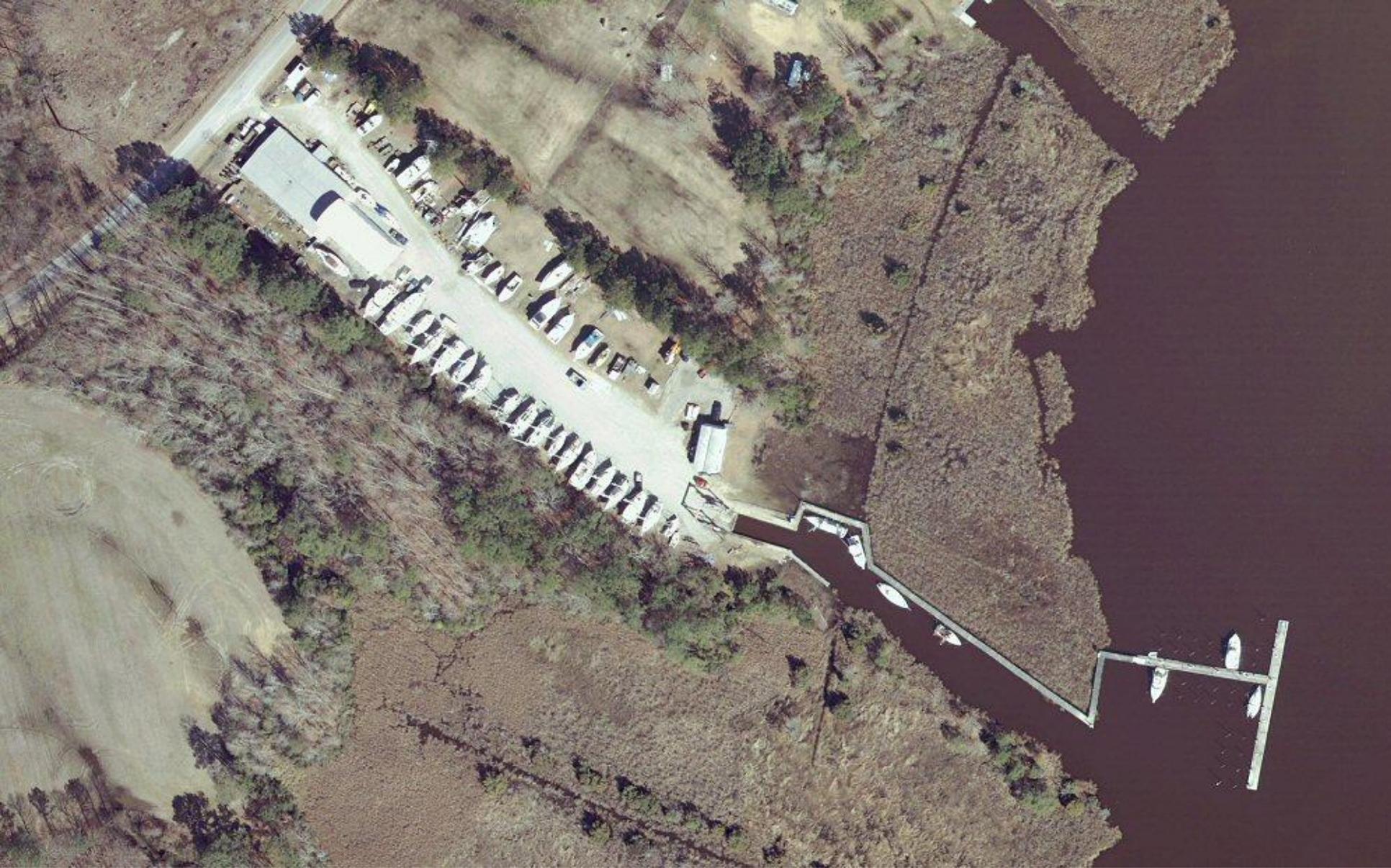
What is a flaw that should be fixed?

- Project expectations
- What is the cost of misrepresentation of a feature?
- What is the effort to modify?
- State Specifications



Visual Quality is High







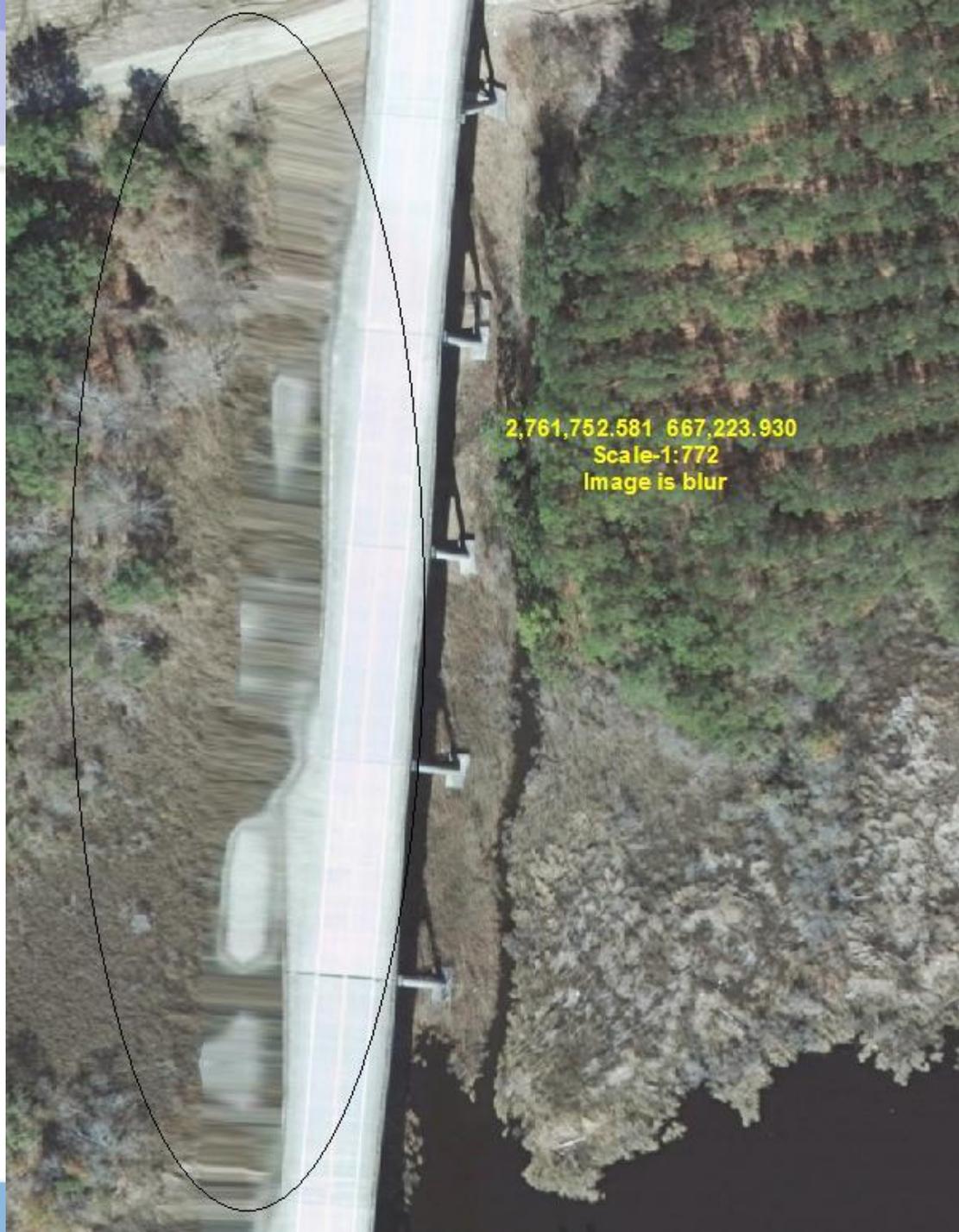


What you should not see



- Major bridge is distorted
- Transportation feature cut and offset by a seam line
- Tall building is cut by a seam line or is leaning extremely
- Areas of state importance distorted or obscured
- Color and contrast changes abruptly at seam edges between contractors
- Artifacts from a flaw in rectification
- Wash out from brightness or too dark to see features





2,761,752.581 667,223.930
Scale-1:772
Image is blur







1,929,811.249 580,108.836 Feet
Scale 1:520
Alinement and color balance



1,931,011.411 579,999.469 Feet
Scale 1:1200
Alinement and color balance

2,109,074.994 929,960.406 Feet
Scale 1:500
Image warped





GRANVILLE

What is acceptable?



- Color balance between regions / contractors
- Some building lean (not nadir)
- Bright roof tops
- Power lines discontinuous
- Leaning trees
- Water as is



North Carolina Orth Proposed Regions for Orthoimagery



Statewide Plan Counties by Region

- Mountain, 21
- Western Piedmont, 26
- Eastern Piedmont, 27
- Coastal Plain, 26
- Coastal Water

Note: regional assignments from the Statewide Orthoimagery 2011







2,006,611.291 951,300.902 Feet
Scale 1:1200
Over exposed and pinkish bldgs

1,605,267.730 912,449.278 FEET
SCALE 1:1200
UTILITY LINES DO NOT MATCH UP



1,537,917.289 465,422.215 Feet

Scale: 1:688

TREE LEAN



What if you find a flaw?



- 90-day period for review
- Contact CGIA with issue
 - Tile name, snapshot, point location
- Project team reviews
- If deemed a flaw and it can be fixed, replacement tiles will be generated after the 90-day period





Share the Data

- Expected sharing:
 - PSAPs within your county
 - GIS operations in municipalities
- NC OneMap for online access (www.nconemap.gov)
 - Download
 - Imagery services



Site Navigation

- Home
- Partners
- Get Data
 - GIS Inventory
 - State Government Mapping Services
 - US National Grid & NC OneMap
 - About NC OneMap
 - NC Orthos
 - Project Status
 - Detailed Description
 - FAQ
 - Resources
 - GIS in NC – Who? What? Where?
 - Blogs

Get Data

- [NC OneMap Viewer](#)
- [FTP Data Download](#)
- [Web Map Services](#)

Statewide

Resource

1. Doc

2. Link

3. Star

4. Data

The
cour
stat
doc

Resources

1. Documents

- [Glossary of Terms](#)
- [North Carolina Orthoimagery Business Plan](#)
- [Positional Quality Control Reports](#)

2. Links

- [Get imagery data](#)

3. Standards

- [Metadata standard and template](#)
- [New state specifications for ortho imagery](#)

4. Data Delivery Presentations

The Ortho Project team is currently delivering orthos to the county NC 911 Coordinators at regional meetings across the state. For information about the meetings and the data, see the documents at the links below.

- [Data Delivery \(excerpts for imagery review\)](#)
- [Data Delivery](#)





Next Steps

- CGIA continues with distribution
- CGIA will follow up to assure quality and usefulness in 911 and GIS
- Derived Products
- Future – Business Plan for Orthoimagery





911 Board Feedback

- The Board needs *your* feedback
- 4-Year Quarter State Plan
- Next Generation 911





Acknowledgements

- NC 911 Board
- City of Durham
- CGIA staff
- Geospatial and Technology Management Office
- NC Geodetic Survey
- Land Records Management, Secretary of State
- Private contractors
- USGS and NGA
- NC ITS: Enterprise Project Management Office; Hosting Services
- State Chief Information Officer
- GICC and Statewide Mapping Advisory Committee
- Working Group for Orthophotography Planning
- Local Government Committee



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