



North Carolina Department of Public Safety

Emergency Management
North Carolina Geodetic Survey

Pat McCrory, Governor
Frank L. Perry, Secretary

Michael A. Sprayberry, Director

Aerial Imagery Quality Control Report – Southern Piedmont and Mountains 2015 Project

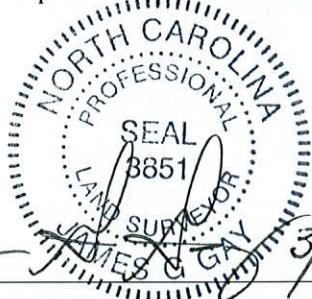
The North Carolina Geodetic Survey (NCGS) performed a horizontal quality control (QC) survey of aerial imagery collected in twenty-four North Carolina counties. The purpose of the QC survey was to test the horizontal accuracy of the aerial imagery collected as part of the 2015 Southern Piedmont and Mountains Orthoimagery Project, which is funded by the NC 911 Board.

NCGS contracted private surveying firms to collect the horizontal QC test points and submit a report, which are on file at NCGS.

In addition to the contractor collected QC test points, NCGS personnel, who were under the supervision of James G. Gay (L-3851), collected supplemental QC test points using the following GNSS survey parameters:

Class of survey:	Class A (horizontal) Class C (vertical)
Horizontal accuracy:	0.01 meters (0.03 USft) at the 95% confidence level
Vertical accuracy:	0.01 meters (0.03 USft) at the 95% confidence level
Type of field procedure used:	North Carolina Real Time Network (NCRTN)
Dates of survey:	January 4, 2016 – January 5, 2016
Horizontal datum/epoch	North American Datum 83(2011) epoch 2010.0
Vertical datum/epoch	North American Vertical Datum of 1988 (NAVD88)
Published fixed control used:	North Carolina Continuously Operating Reference Station (CORS) Network and North Carolina Real-Time Network (NCRTN)
Geoid model:	Geoid 12A and Geoid 12B
Combined grid factor:	See included control spreadsheet
Units:	US Survey Feet

The attached report contains the results of the horizontal QC surveys conducted by the contractors and the supplemental QC surveys conducted by NCGS personnel. The review of the field data and the generation of the final QC report were performed under the supervision of Gary W. Thompson (L-2694).



James G. Gay 3/21/2016
James G. Gay L-3851 date



Gary W. Thompson 3/23/16
Gary W. Thompson L-2694 date

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Raleigh NC 27699-4298
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This report contains the horizontal QC reports for the following counties:

- Anson
- Buncombe
- Cabarrus
- Cherokee
- Clay
- Cleveland
- Gaston
- Graham
- Haywood
- Henderson
- Jackson
- Lincoln
- Macon
- Mecklenburg
- Montgomery
- Moore
- Polk
- Richmond
- Rutherford
- Scotland
- Stanly
- Swain
- Transylvania
- Union

2015 Orthoimagery Statistics Summary

NAD 83/2011 US Survey Feet

County	MinΔX:	MinΔY:	MaxΔX:	MaxΔY:	MeanΔX	MeanΔY	RmseX:	RmseY:	RmseH:	CE90:	CE95:	CI:	No.Obs.:	NSSDA:
Anson	-0.608	-0.911	0.608	1.085	-0.011	-0.057	0.284	0.313	0.423	0.646	0.736	0.106	31	0.732
Buncombe	-1.215	-0.564	1.389	0.564	-0.072	-0.003	0.458	0.286	0.540	0.801	0.914	0.107	47	0.935
Cabarrus	-1.128	-0.825	0.781	0.911	0.000	0.120	0.412	0.387	0.565	0.850	0.970	0.135	33	0.979
Cherokee	-0.781	-1.085	1.128	1.259	0.118	0.094	0.419	0.411	0.587	0.875	0.998	0.144	31	1.016
Clay	-0.781	-0.564	0.608	0.738	-0.032	0.029	0.380	0.271	0.467	0.707	0.806	0.118	30	0.807
Cleveland	-0.781	-0.391	0.608	0.651	-0.136	0.054	0.297	0.239	0.381	0.541	0.617	0.087	32	0.659
Gaston	-1.215	-0.651	0.955	0.825	-0.263	0.151	0.580	0.360	0.682	0.918	1.048	0.146	33	1.181
Graham	-1.128	-0.391	1.042	0.564	-0.098	0.010	0.380	0.217	0.437	0.637	0.726	0.104	31	0.757
Haywood	-0.955	-0.564	0.781	1.085	-0.159	0.182	0.406	0.442	0.600	0.847	0.966	0.141	30	1.039
Henderson	-0.608	-0.391	0.521	0.738	-0.014	0.147	0.242	0.288	0.376	0.534	0.609	0.088	31	0.651
Jackson	-0.694	-0.998	0.781	1.432	-0.036	0.083	0.420	0.443	0.611	0.932	1.063	0.153	31	1.057
Lincoln	-0.781	-0.651	1.042	1.085	0.126	0.096	0.467	0.318	0.565	0.820	0.935	0.130	33	0.977
Macon	-1.476	-0.998	2.865	0.911	0.237	0.008	0.775	0.453	0.898	1.297	1.480	0.203	34	1.554
Mecklenburg	-0.781	-0.738	2.778	1.259	0.060	0.129	0.515	0.397	0.650	0.958	1.093	0.109	65	1.125
Montgomery	-0.781	-1.345	5.469	0.911	0.118	0.083	1.020	0.416	1.101	1.547	1.765	0.246	33	1.906
Moore	-1.128	-0.304	0.694	0.651	0.060	0.098	0.386	0.258	0.464	0.675	0.770	0.109	32	0.803
Polk	-0.955	-0.651	0.347	0.217	-0.104	-0.172	0.328	0.280	0.431	0.580	0.661	0.095	31	0.746
Richmond	-1.302	-0.564	0.868	1.085	-0.079	0.238	0.442	0.414	0.606	0.843	0.961	0.134	33	1.048
Rutherford	-0.955	-0.998	0.608	0.564	-0.149	-0.054	0.379	0.317	0.494	0.720	0.822	0.116	32	0.855
Scotland	-0.608	-0.738	0.868	0.825	0.113	-0.065	0.368	0.291	0.469	0.690	0.787	0.105	36	0.812
Stanly	-0.781	-1.259	0.955	0.998	-0.020	0.119	0.353	0.413	0.543	0.816	0.931	0.134	31	0.940
Swain	-0.955	-0.825	0.868	1.085	-0.003	0.009	0.428	0.409	0.592	0.914	1.042	0.152	30	1.025
Transylvania	-1.128	-0.825	0.868	1.085	-0.111	0.159	0.463	0.393	0.607	0.879	1.003	0.134	36	1.050
Union	-1.042	-0.564	0.955	0.738	0.073	0.068	0.364	0.298	0.470	0.700	0.798	0.085	57	0.814
County-Wide Average							0.440	0.346	0.565	0.822	0.938	0.128		0.978

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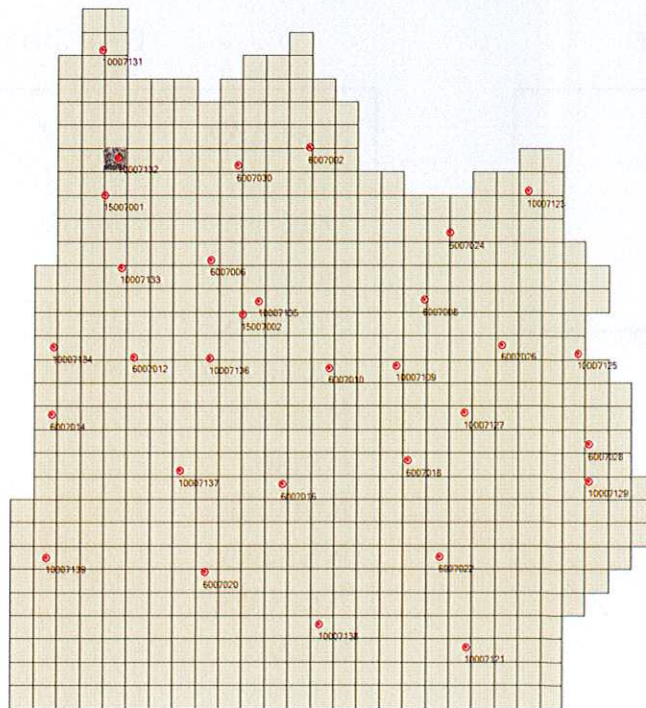
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Spatial Data Consultants, Inc.
Date of Aquisition: Start: 2/8/2015 Finish: 3/7/2015

Metadata Information

Index File Name: anson_files.shp
of Polygons: 633
of Matching Images: 633
Polygon ID: filename
Units: Feet
Image Folder Path: G:\imagery2015\Anson2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area

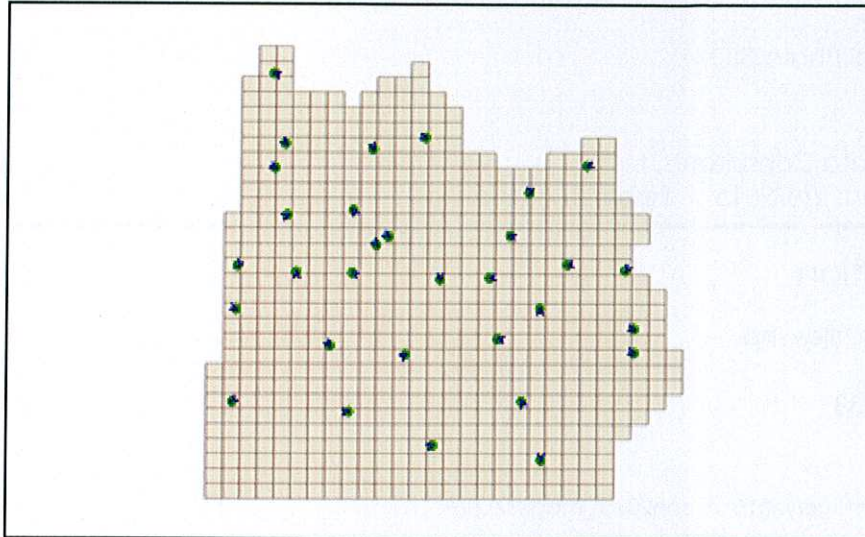


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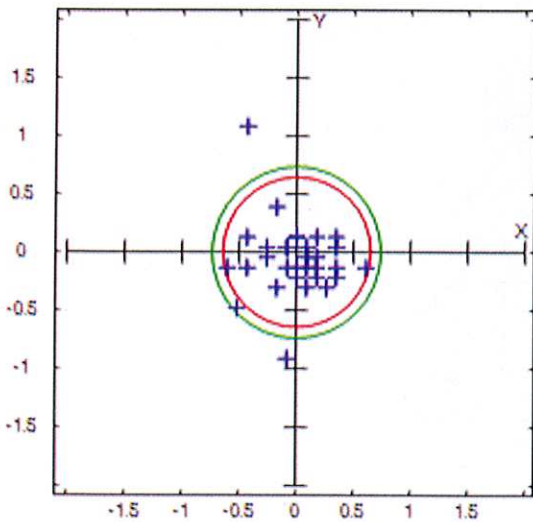


Vector Offset



Scaling Factor: 200

Circular Error

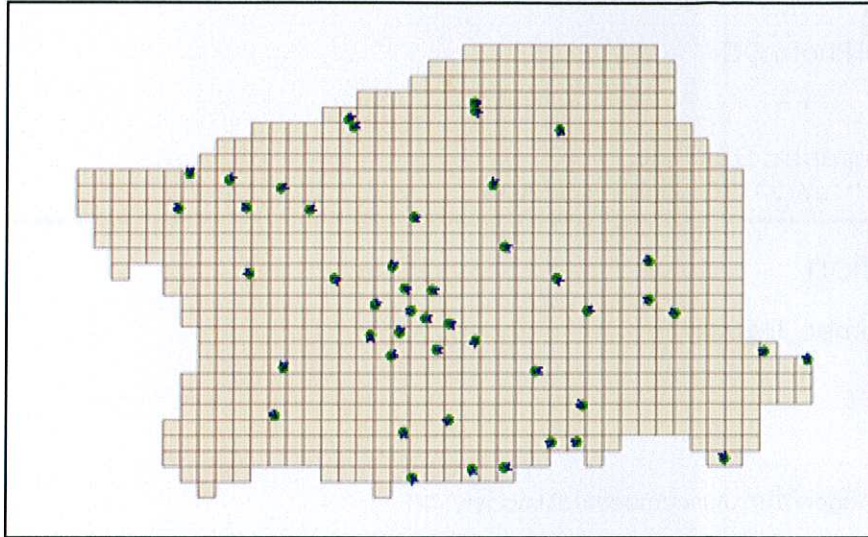


Error Statistics

Min ΔX :	-0.608
Min ΔY :	-0.911
Max ΔX :	0.608
Max ΔY :	1.085
Mean ΔX :	-0.011
Mean ΔY :	-0.057
RmseX:	0.284
RmseY:	0.313
RmseH:	0.423
NSSDA:	0.732
No. Obs.:	31
CE 90:	0.646
CE 95:	0.736
CI:	0.106



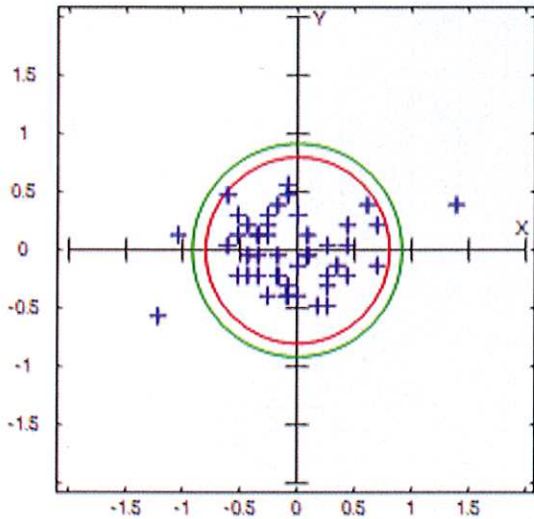
Vector Offset



Scaling Factor: 200

Circular Error

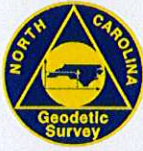
Error Statistics



Min ΔX :	-1.215
Min ΔY :	-0.564
Max ΔX :	1.389
Max ΔY :	0.564
Mean ΔX :	-0.072
Mean ΔY :	-0.003
RmseX:	0.458
RmseY:	0.286
RmseH:	0.54
NSSDA:	0.935
No. Obs.:	47
CE 90:	0.801
CE 95:	0.914
CI:	0.107

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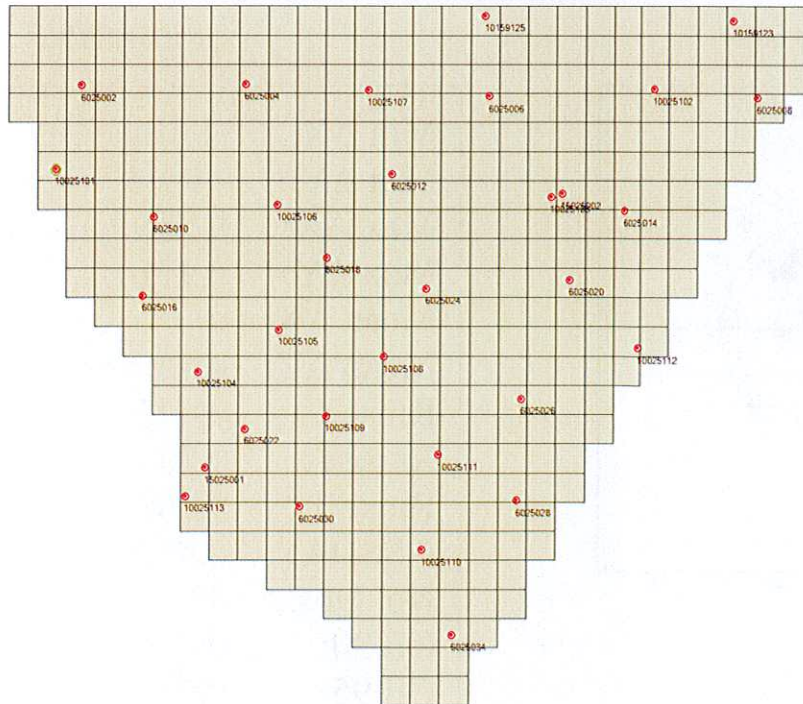
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Spatial Data Consultants, Inc.
Date of Aquisition: Start: 2/13/2015 Finish: 3/16/2015

Metadata Information

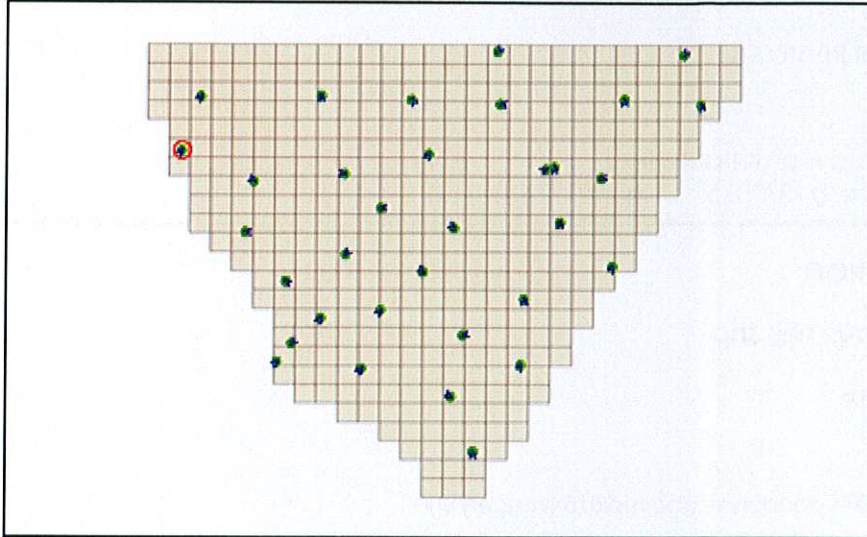
Index File Name: cabarrus_files.shp
of Polygons: 419
of Matching Images: 419
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015_imagery\Cabarrus2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



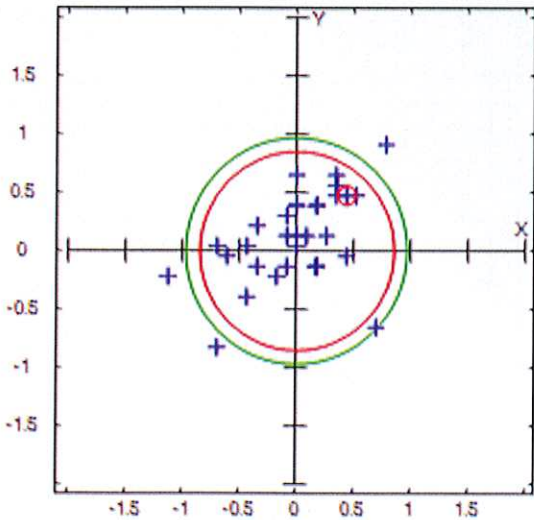


Vector Offset



Scaling Factor: 200

Circular Error

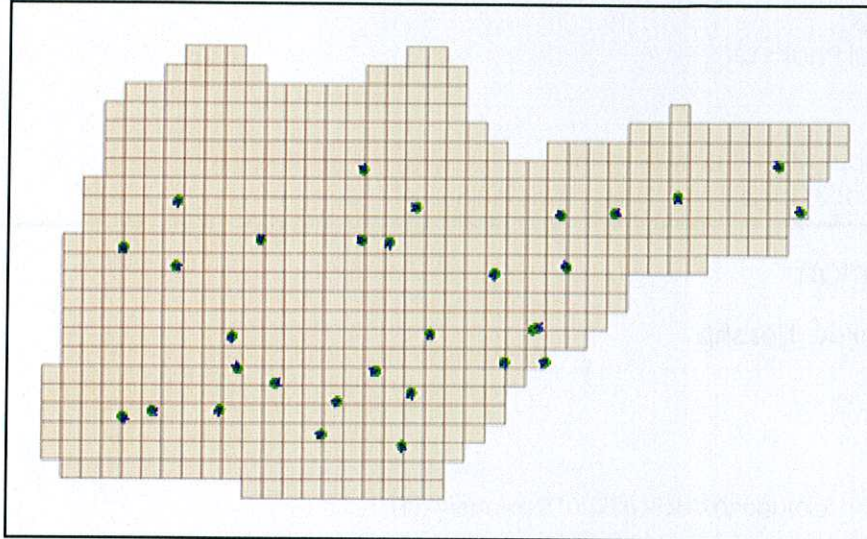


Error Statistics

Min ΔX :	-1.128
Min ΔY :	-0.825
Max ΔX :	0.781
Max ΔY :	0.911
Mean ΔX :	0
Mean ΔY :	0.12
RmseX:	0.412
RmseY:	0.387
RmseH:	0.565
NSSDA:	0.979
No. Obs.:	33
CE 90:	0.85
CE 95:	0.97
CI:	0.135

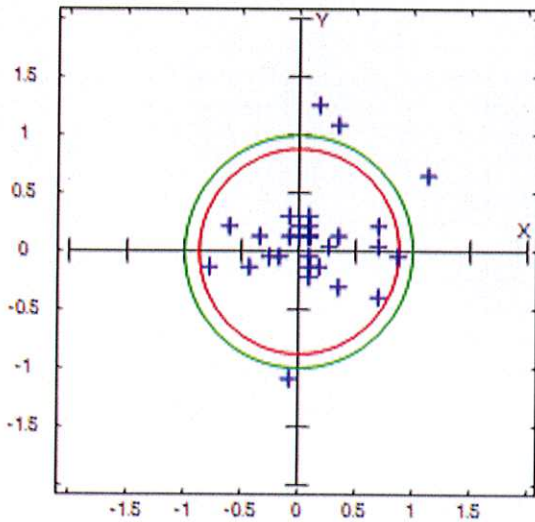


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-0.781
Min ΔY :	-1.085
Max ΔX :	1.128
Max ΔY :	1.259
Mean ΔX :	0.118
Mean ΔY :	0.094
RmseX:	0.419
RmseY:	0.411
RmseH:	0.587
NSSDA:	1.016
No. Obs.:	31
CE 90:	0.875
CE 95:	0.998
CI:	0.144

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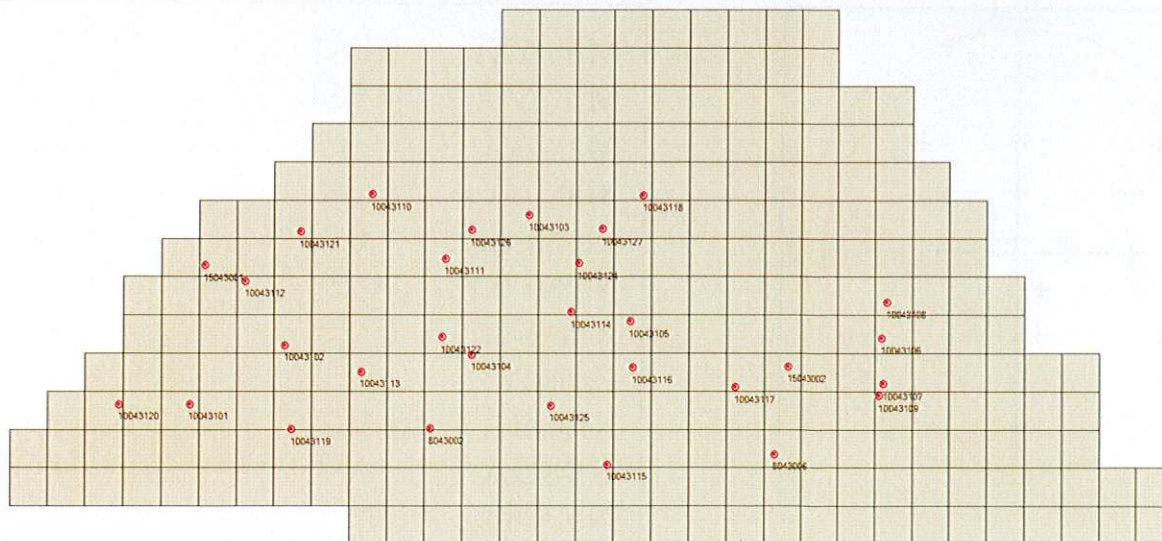
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: The Sanborn Map Company, Inc.
Date of Aquisition: Start: 3/28/2015 Finish: 4/4/2015

Metadata Information

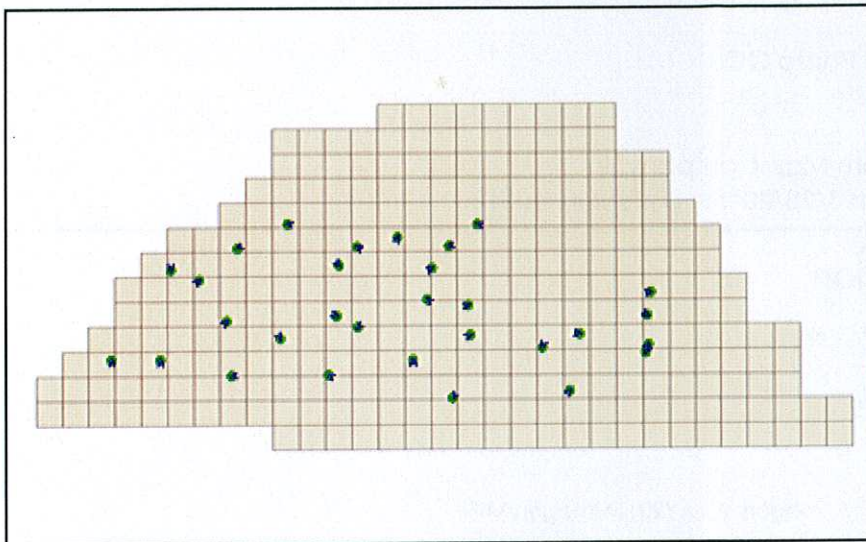
Index File Name: clay_tiles.shp
of Polygons: 299
of Matching Images: 299
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015_imagery\CLAY2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



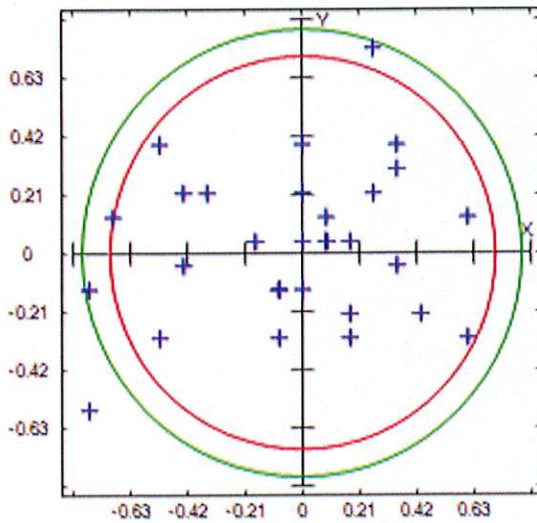


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-0.781
Min ΔY :	-0.564
Max ΔX :	0.608
Max ΔY :	0.738
Mean ΔX :	-0.032
Mean ΔY :	0.029
RmseX:	0.38
RmseY:	0.271
RmseH:	0.467
NSSDA:	0.807
No. Obs.:	30
CE 90:	0.707
CE 95:	0.806
CI:	0.118

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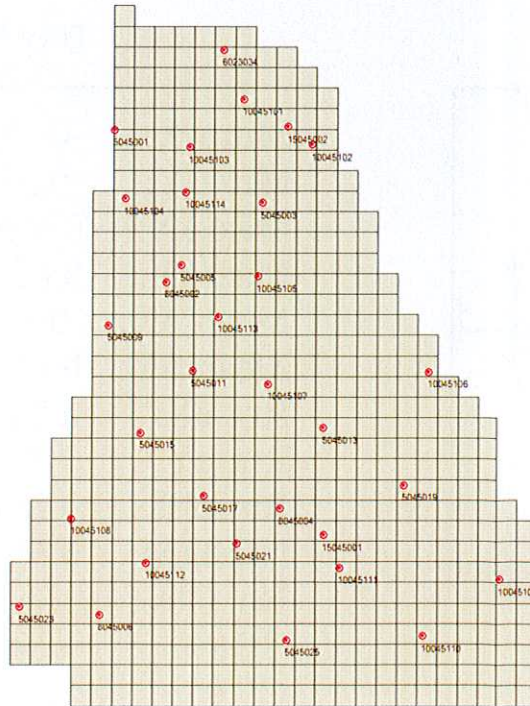
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Surdex Corporation
Date of Aquisition: Start: 3/29/2015 Finish: 4/1/2015

Metadata Information

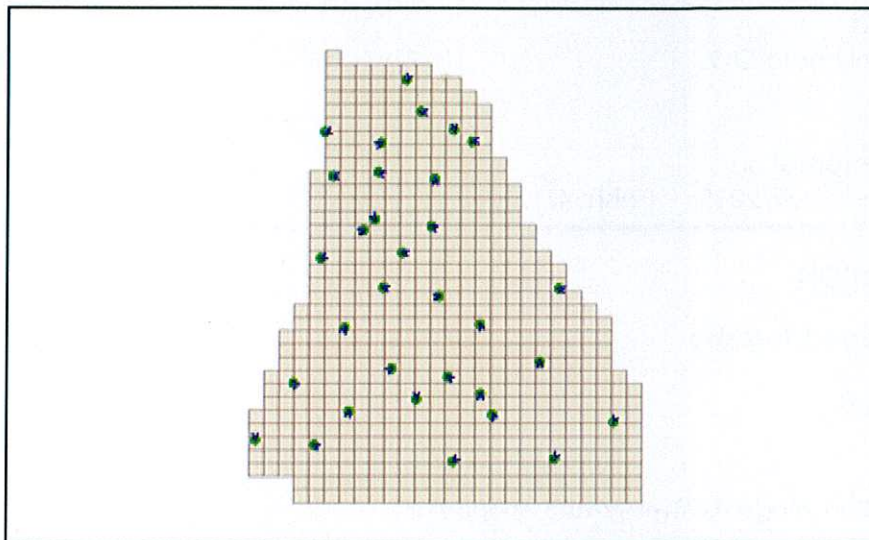
Index File Name: cleveland_tiles.shp
of Polygons: 593
of Matching Images: 593
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015_imagery\Cleveland2015\Imagery\Tiff
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



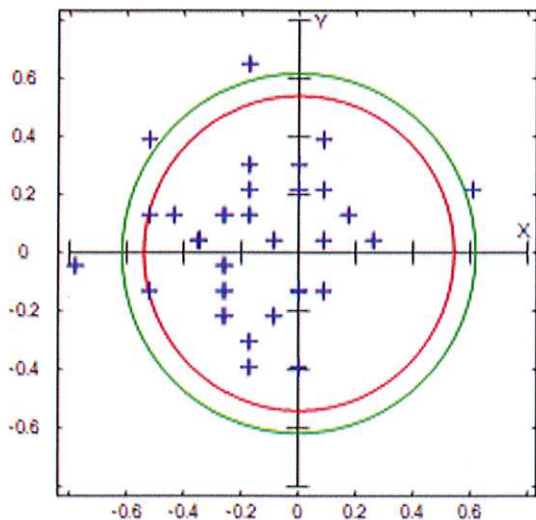


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-0.781
Min ΔY :	-0.391
Max ΔX :	0.608
Max ΔY :	0.651
Mean ΔX :	-0.136
Mean ΔY :	0.054
RmseX:	0.297
RmseY:	0.239
RmseH:	0.381
NSSDA:	0.659
No. Obs.:	32
CE 90:	0.541
CE 95:	0.617
CI:	0.087

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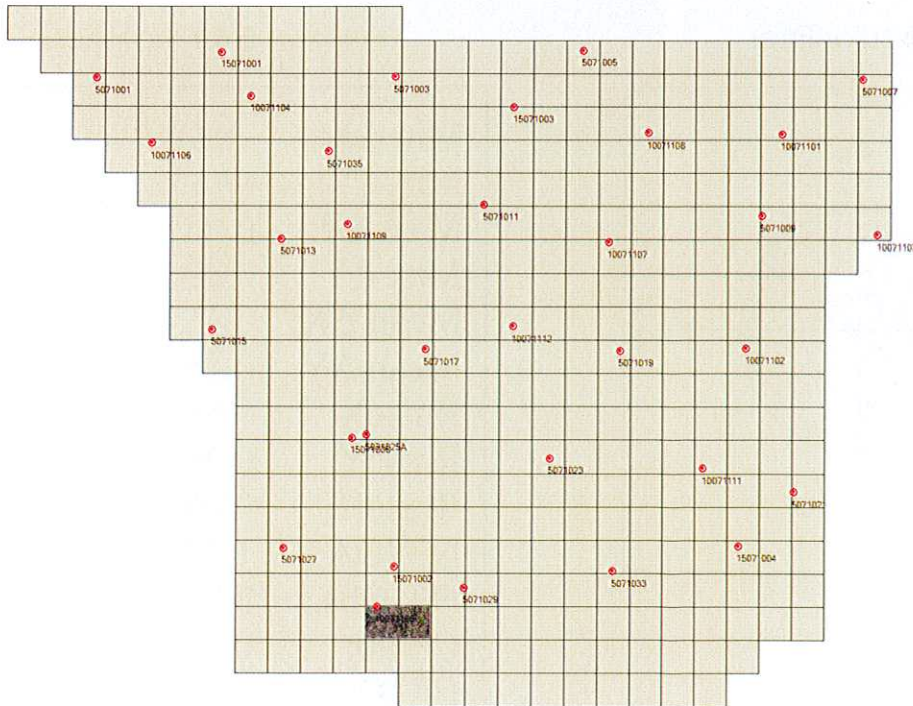
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Surdex Corporation
Date of Aquisition: Start: 3/29/2015 Finish: 4/1/2015

Metadata Information

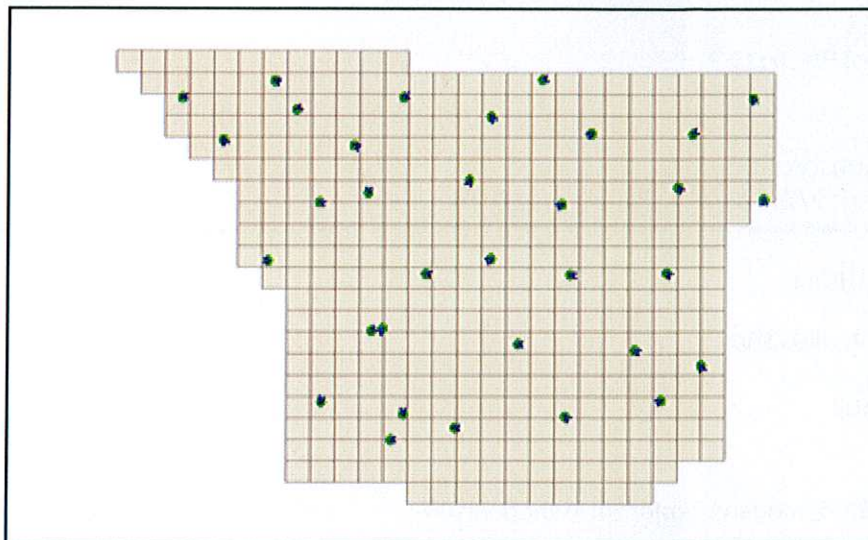
Index File Name: gaston_tiles.shp
of Polygons: 407
of Matching Images: 407
Polygon ID: filename
Units: Feet
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Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



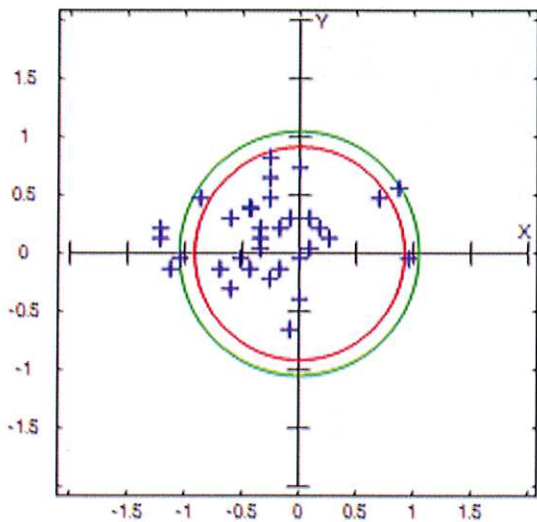


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-1.215
Min ΔY :	-0.651
Max ΔX :	0.955
Max ΔY :	0.825
Mean ΔX :	-0.263
Mean ΔY :	0.151
RmseX:	0.58
RmseY:	0.36
RmseH:	0.682
NSSDA:	1.181
No. Obs.:	33
CE 90:	0.918
CE 95:	1.048
CI:	0.146

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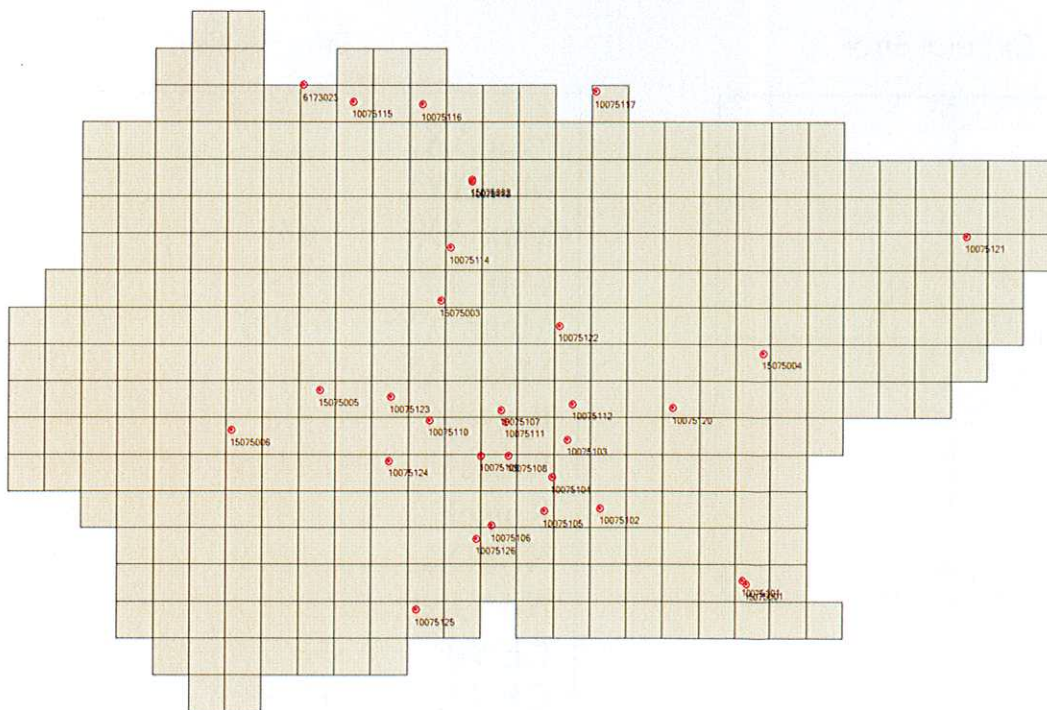
Project Information

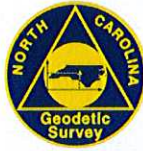
Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: The Sanborn Map Company, Inc.
Date of Aquisition: Start: 3/31/2015 Finish: 4/5/2015

Metadata Information

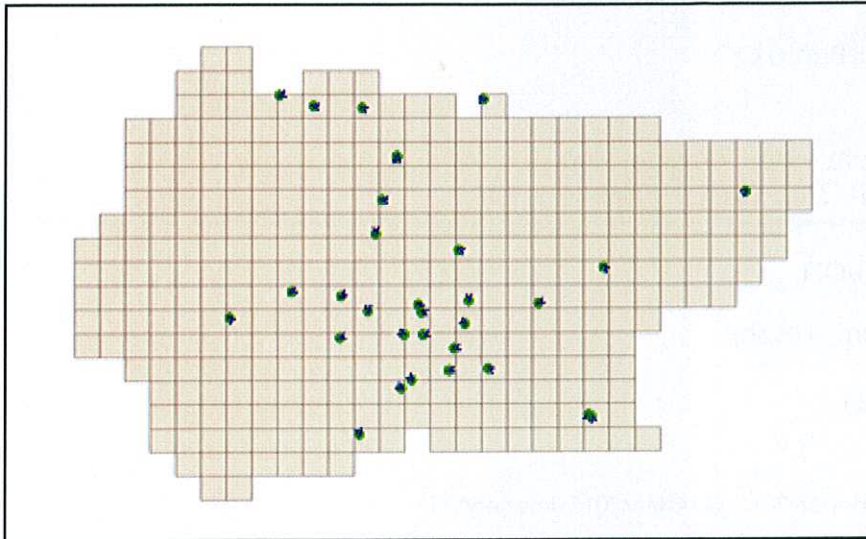
Index File Name: graham_files.shp
of Polygons: 361
of Matching Images: 361
Polygon ID: filename
Units: Feet
Image Folder Path: G:\imagery2015\GRAHAM2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



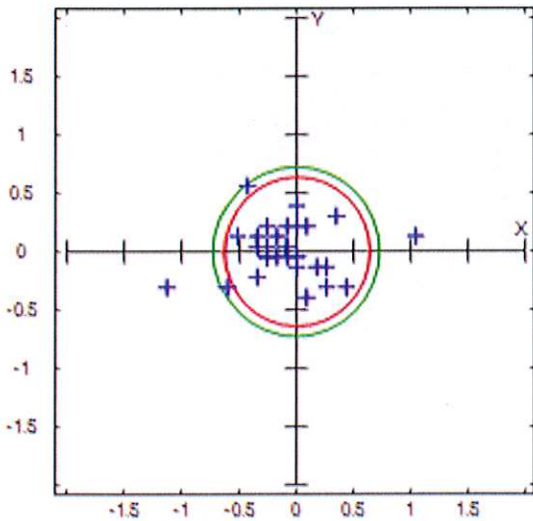


Vector Offset



Scaling Factor: 200

Circular Error

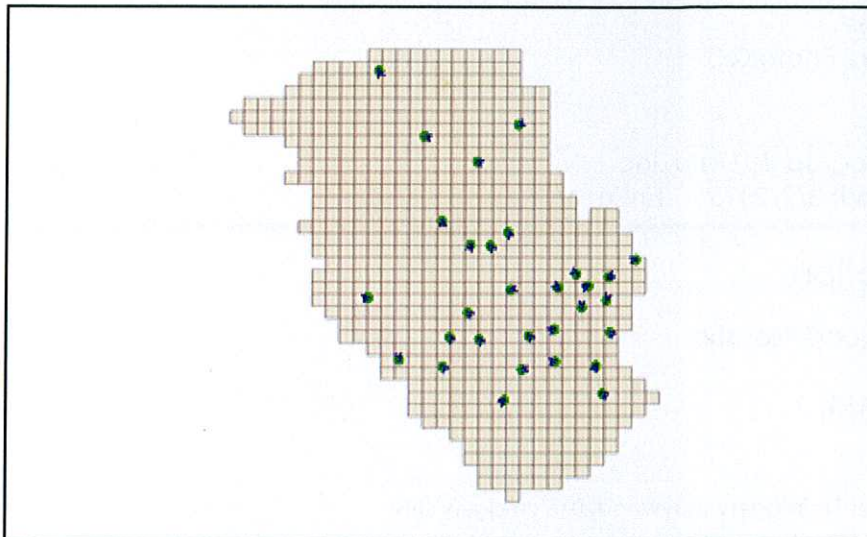


Error Statistics

Min ΔX :	-1.128
Min ΔY :	-0.391
Max ΔX :	1.042
Max ΔY :	0.564
Mean ΔX :	-0.098
Mean ΔY :	0.01
RmseX:	0.38
RmseY:	0.217
RmseH:	0.437
NSSDA:	0.757
No. Obs.:	31
CE 90:	0.637
CE 95:	0.726
CI:	0.104

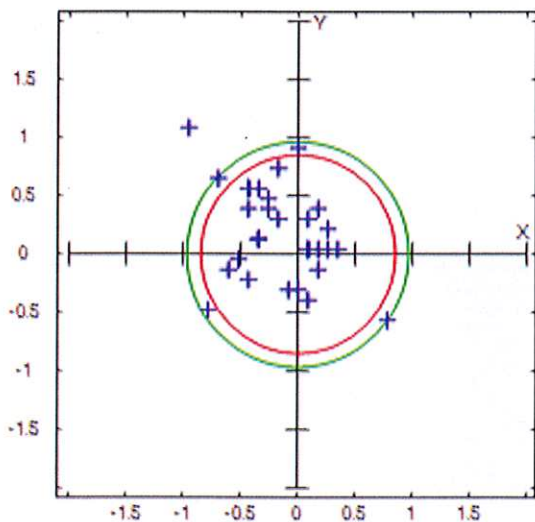


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-0.955
Min ΔY :	-0.564
Max ΔX :	0.781
Max ΔY :	1.085
Mean ΔX :	-0.159
Mean ΔY :	0.182
RmseX:	0.406
RmseY:	0.442
RmseH:	0.6
NSSDA:	1.039
No. Obs.:	30
CE 90:	0.847
CE 95:	0.966
CI:	0.141

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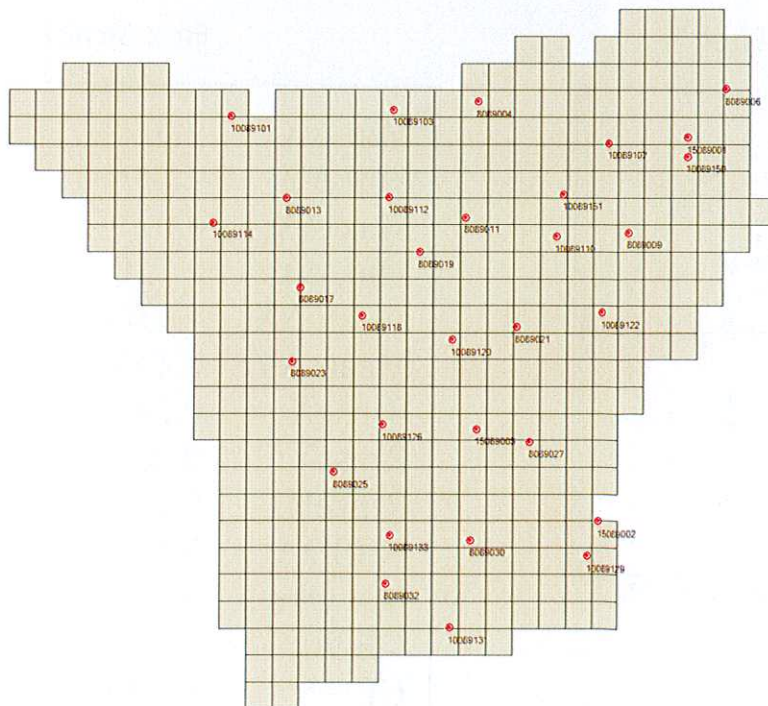
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Atlas Geographic Data, Inc.
Date of Aquisition: Start: 3/8/2015 Finish: 3/31/2015

Metadata Information

Index File Name: henderson_tiles.shp
of Polygons: 441
of Matching Images: 441
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015_imagery\Henderson2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area

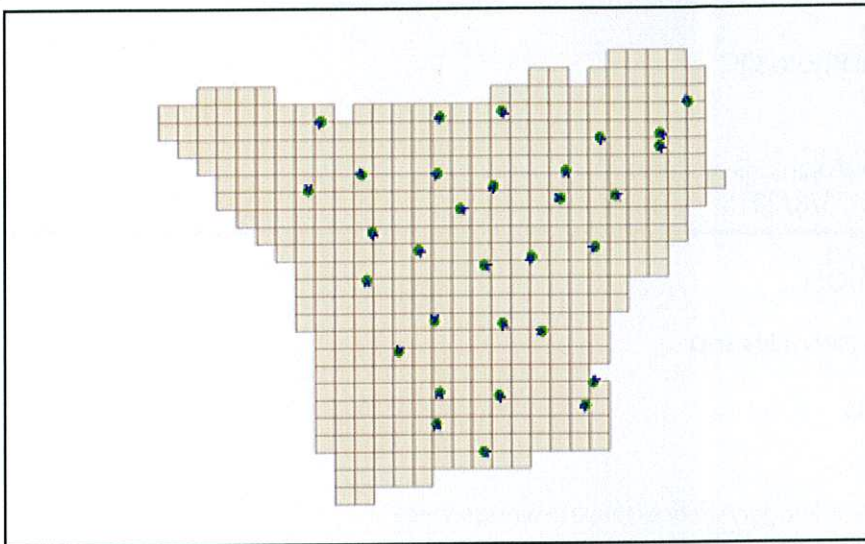


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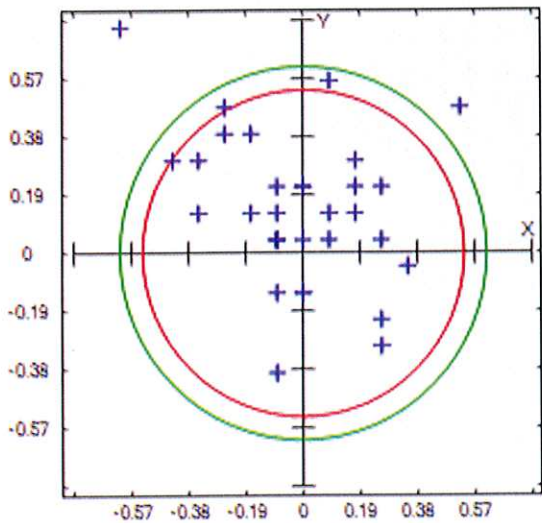


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-0.608
Min ΔY :	-0.391
Max ΔX :	0.521
Max ΔY :	0.738
Mean ΔX :	-0.014
Mean ΔY :	0.147
RmseX:	0.242
RmseY:	0.288
RmseH:	0.376
NSSDA:	0.651
No. Obs.:	31
CE 90:	0.534
CE 95:	0.609
CI:	0.088

NORTH CAROLINA GEODETIC SURVEY

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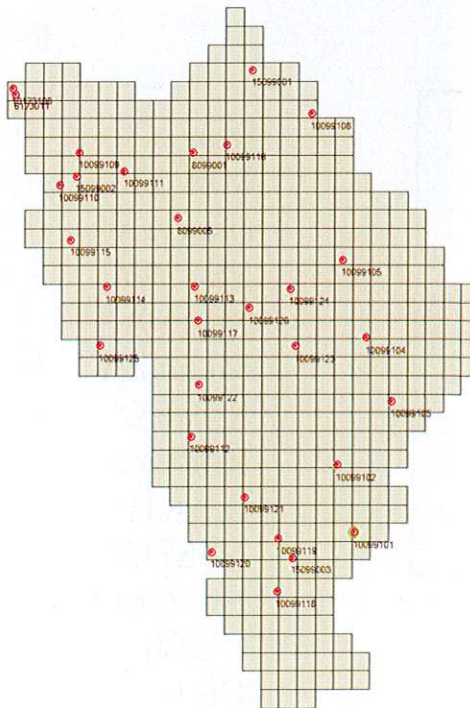
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Atlas Geographic Data, Inc.
Date of Aquisition: Start: 3/7/2015 Finish: 4/1/2015

Metadata Information

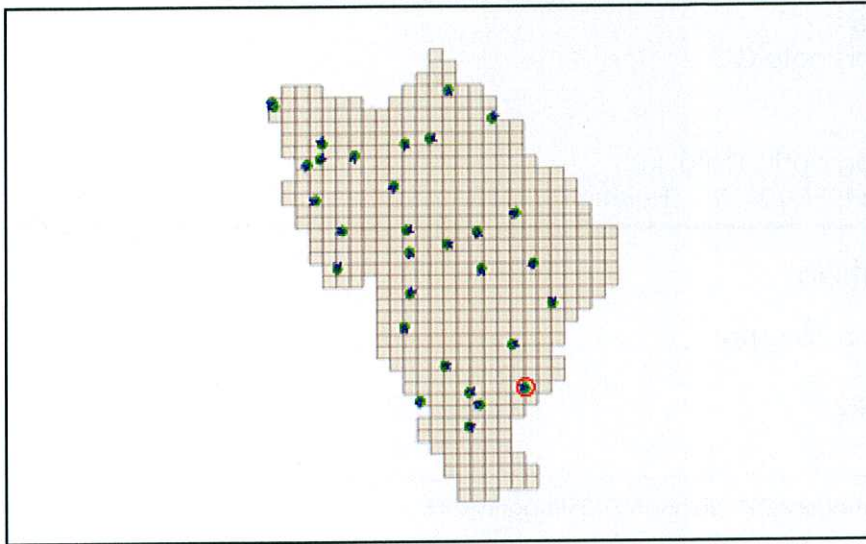
Index File Name: jackson_tiles.shp
of Polygons: 522
of Matching Images: 522
Polygon ID: filename
Units: Feet
Image Folder Path: G:\imagery2015\Jackson2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



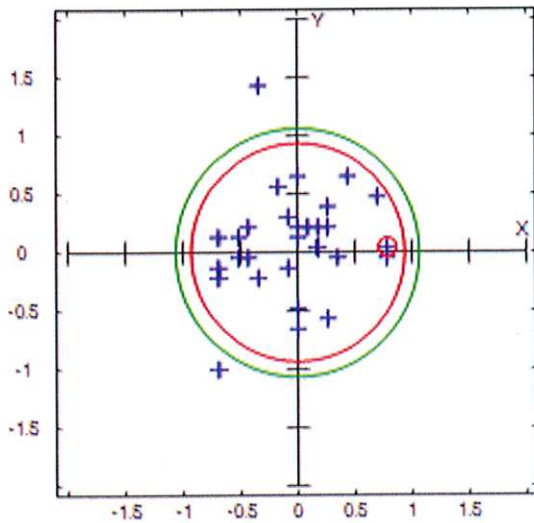


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-0.694
Min ΔY :	-0.998
Max ΔX :	0.781
Max ΔY :	1.432
Mean ΔX :	-0.036
Mean ΔY :	0.083
RmseX:	0.42
RmseY:	0.443
RmseH:	0.611
NSSDA:	1.057
No. Obs.:	31
CE 90:	0.932
CE 95:	1.063
CI:	0.153

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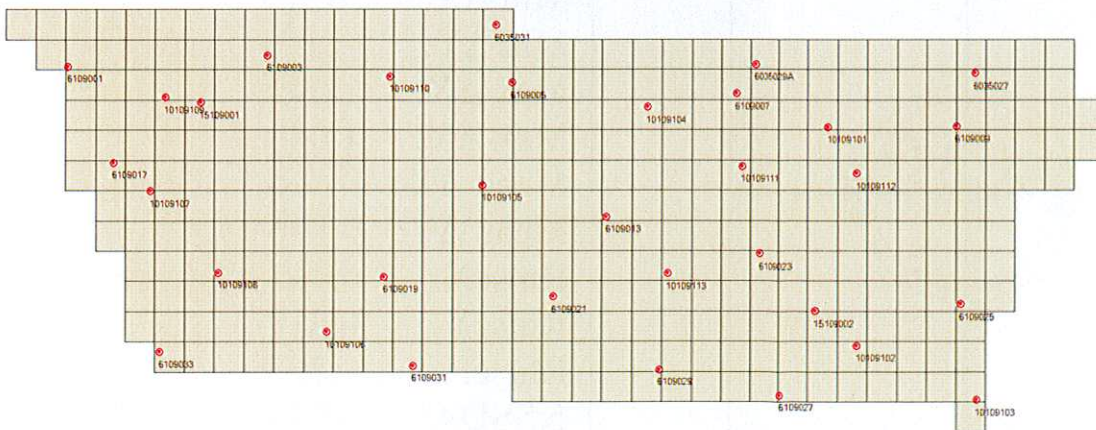
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Surdex Corporation
Date of Aquisition: Start: 3/7/2015 Finish: 4/1/2015

Metadata Information

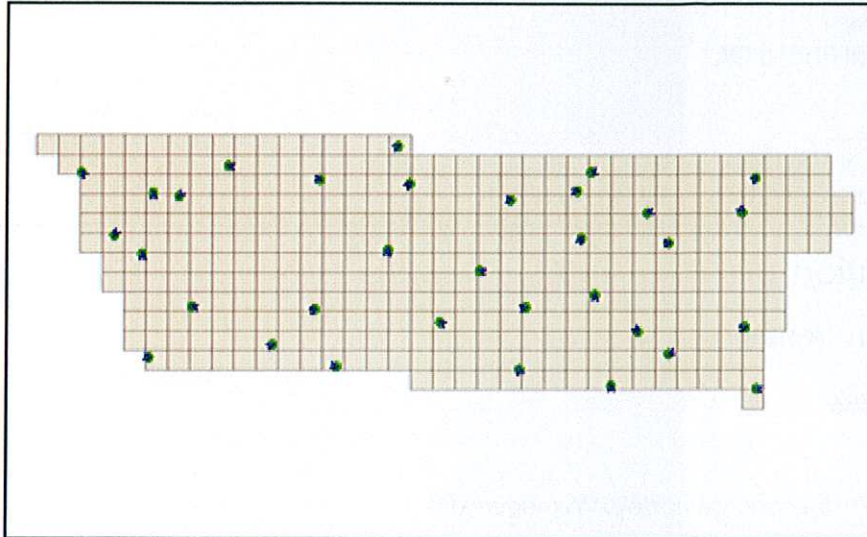
Index File Name: lincoln_tiles.shp
of Polygons: 386
of Matching Images: 386
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015_imagery\Lincoln2015\Imagery\Tiff
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



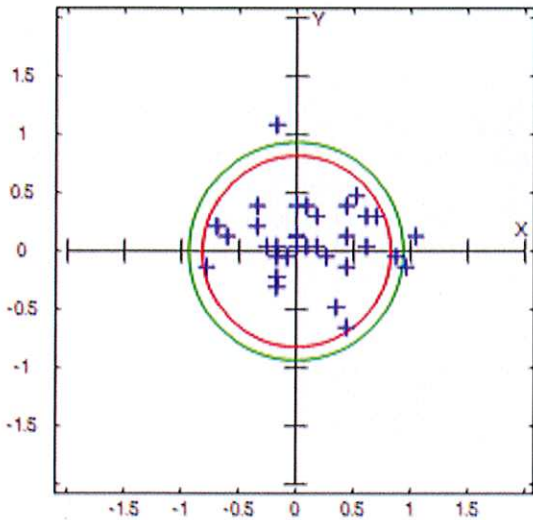


Vector Offset



Scaling Factor: 200

Circular Error

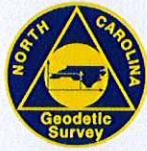


Error Statistics

Min ΔX :	-0.781
Min ΔY :	-0.651
Max ΔX :	1.042
Max ΔY :	1.085
Mean ΔX :	0.126
Mean ΔY :	0.096
RmseX:	0.467
RmseY:	0.318
RmseH:	0.565
NSSDA:	0.977
No. Obs.:	33
CE 90:	0.82
CE 95:	0.935
CI:	0.13

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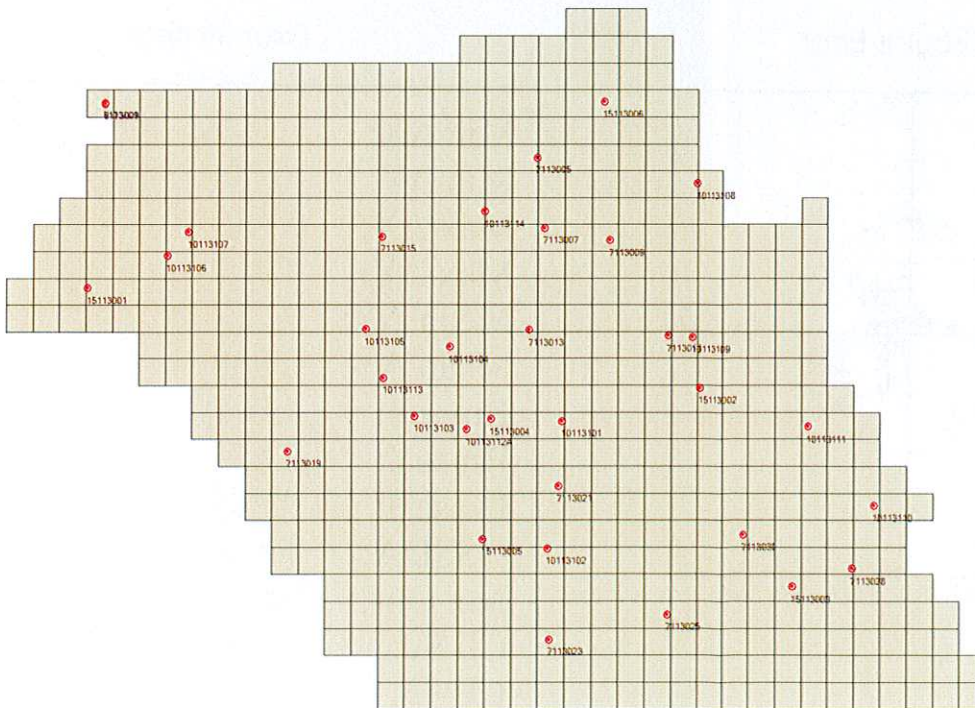
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: The Sanborn Map Company, Inc.
Date of Aquisition: Start: 3/16/2015 Finish: 4/4/2015

Metadata Information

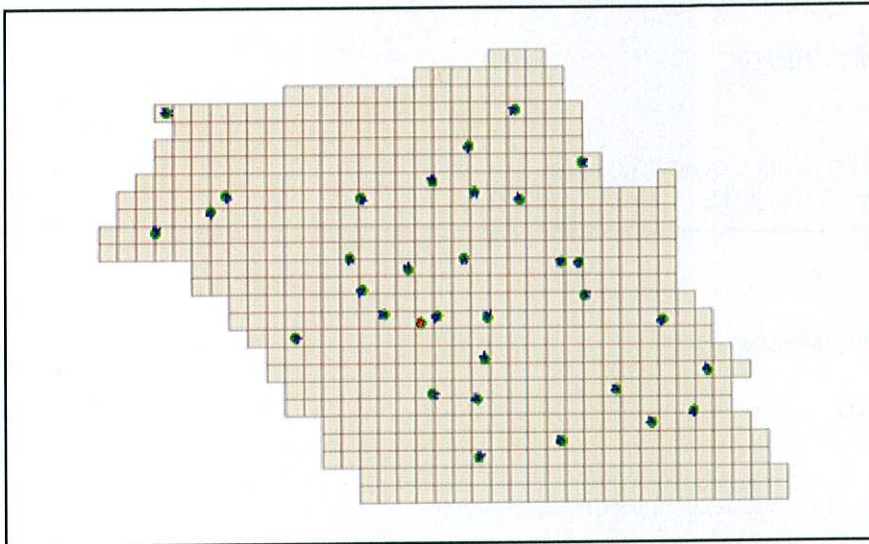
Index File Name: macon_tiles.shp
of Polygons: 610
of Matching Images: 610
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015_imagery\MACON2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



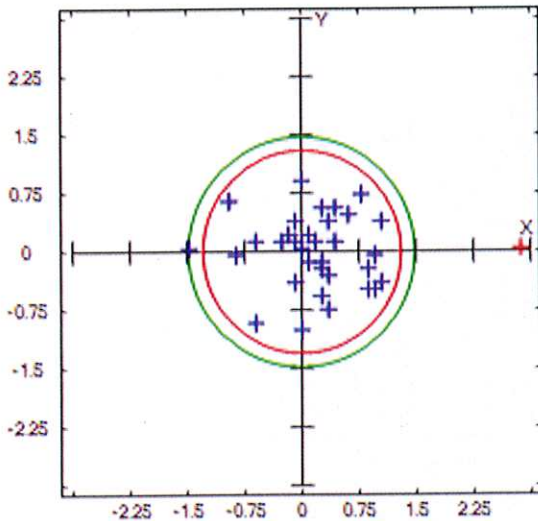


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-1.476
Min ΔY :	-0.998
Max ΔX :	2.865
Max ΔY :	0.911
Mean ΔX :	0.237
Mean ΔY :	0.008
RmseX:	0.775
RmseY:	0.453
RmseH:	0.898
NSSDA:	1.554
No. Obs.:	34
CE 90:	1.297
CE 95:	1.48
CI:	0.203

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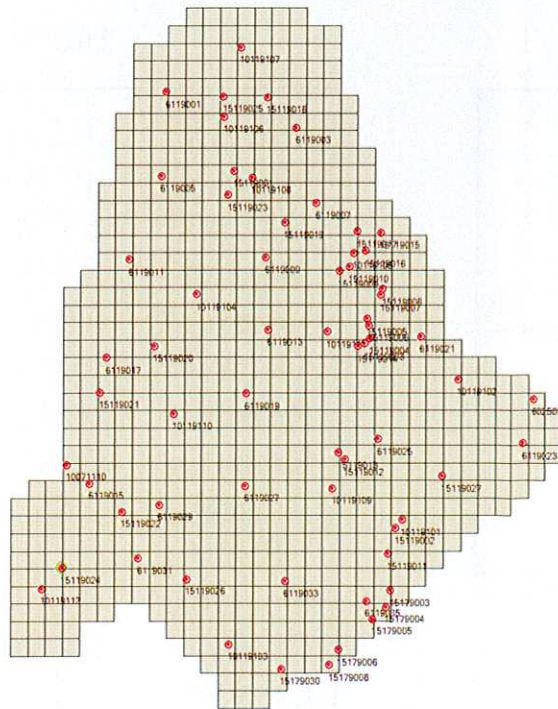
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Spatial Data Consultants, Inc.
Date of Acquisition: Start: 2/14/2015 Finish: 3/16/2015

Metadata Information

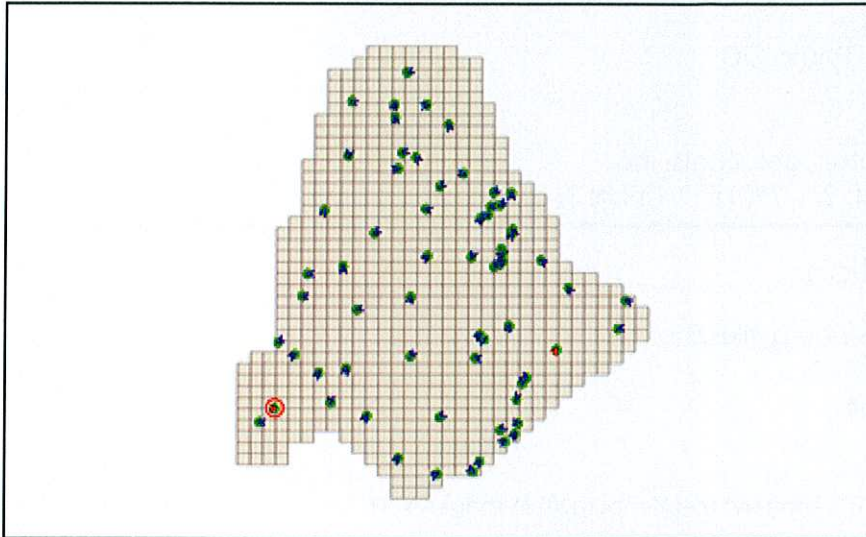
Index File Name: mecklenburg_tiles.shp
of Polygons: 766
of Matching Images: 766
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015_imagery\Mecklenburg2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



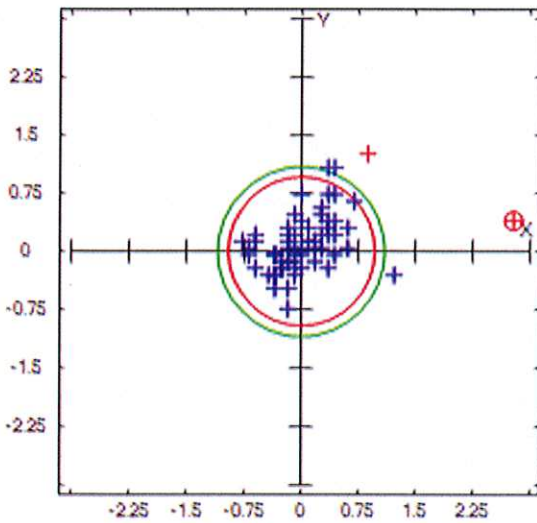


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-0.781
Min ΔY :	-0.738
Max ΔX :	2.778
Max ΔY :	1.259
Mean ΔX :	0.06
Mean ΔY :	0.129
RmseX:	0.515
RmseY:	0.397
RmseH:	0.65
NSSDA:	1.125
No. Obs.:	65
CE 90:	0.958
CE 95:	1.093
CI:	0.109

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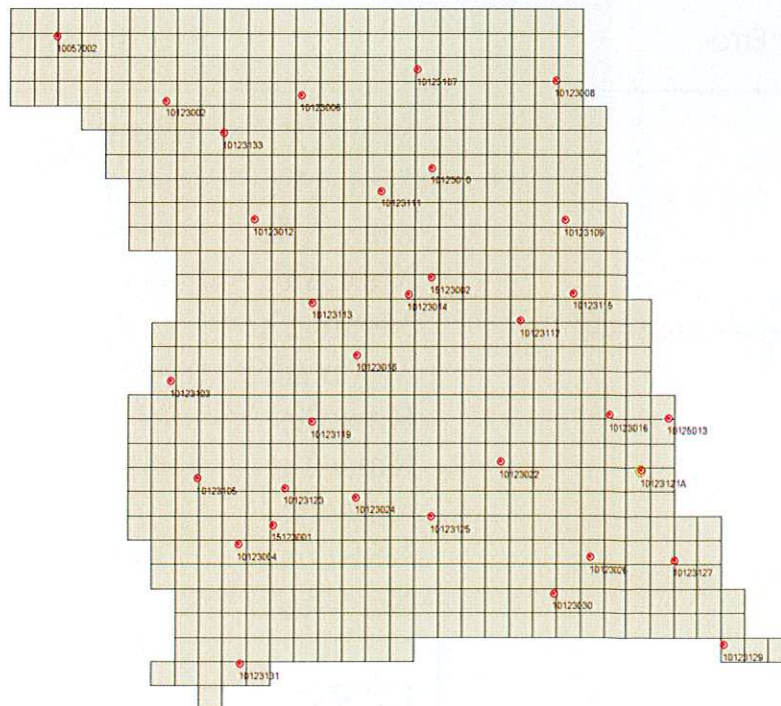
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Quantum Spatial, Inc.
Date of Aquisition: Start: 3/8/2015 Finish: 4/1/2015

Metadata Information

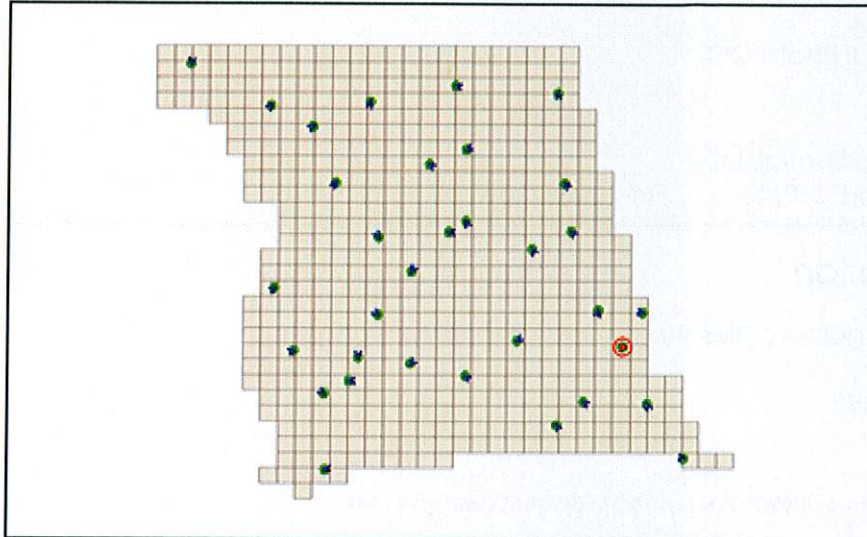
Index File Name: montgomery_tiles.shp
of Polygons: 598
of Matching Images: 598
Polygon ID: filename
Units: Feet
Image Folder Path: G:\imagery2015\MONTGOMERY2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



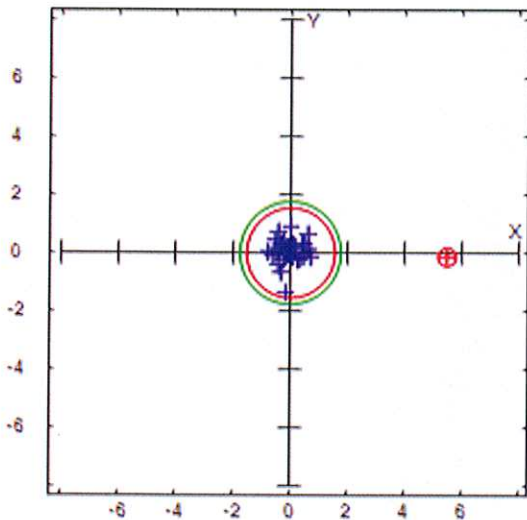


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-0.781
Min ΔY :	-1.345
Max ΔX :	5.469
Max ΔY :	0.911
Mean ΔX :	0.118
Mean ΔY :	0.083
RmseX:	1.02
RmseY:	0.416
RmseH:	1.101
NSSDA:	1.906
No. Obs.:	33
CE 90:	1.547
CE 95:	1.765
CI:	0.246

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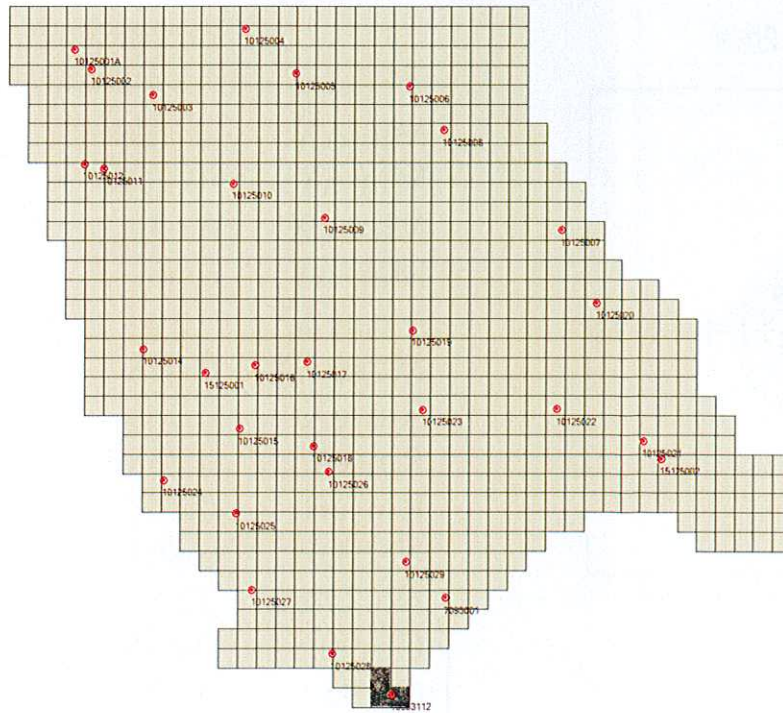
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Quantum Spatial, Inc.
Date of Aquisition: Start: 3/29/2015 Finish: 4/1/2015

Metadata Information

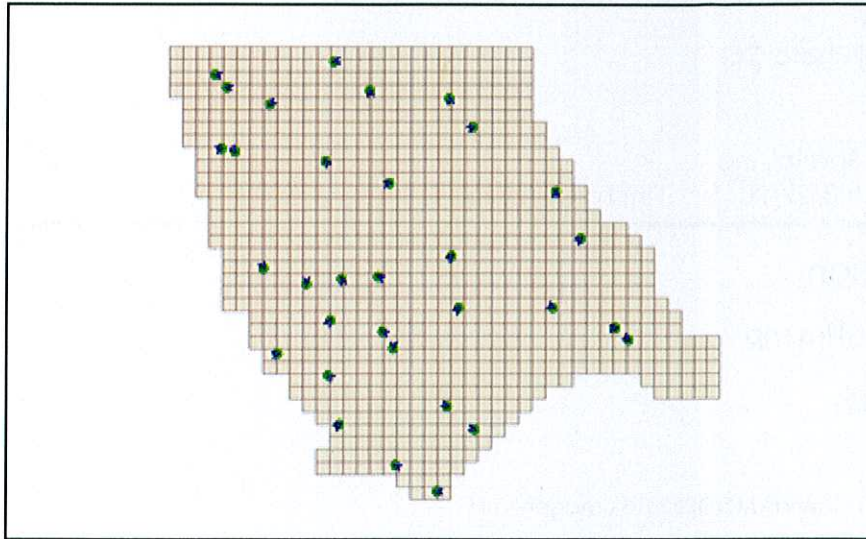
Index File Name: moore_tiles.shp
of Polygons: 912
of Matching Images: 912
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015Aerial\MOORE2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



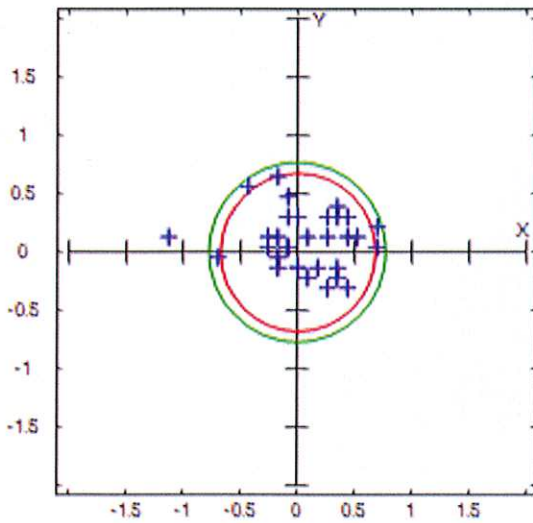


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-1.128
Min ΔY :	-0.304
Max ΔX :	0.694
Max ΔY :	0.651
Mean ΔX :	0.06
Mean ΔY :	0.098
RmseX:	0.386
RmseY:	0.258
RmseH:	0.464
NSSDA:	0.803
No. Obs.:	32
CE 90:	0.675
CE 95:	0.77
CI:	0.109

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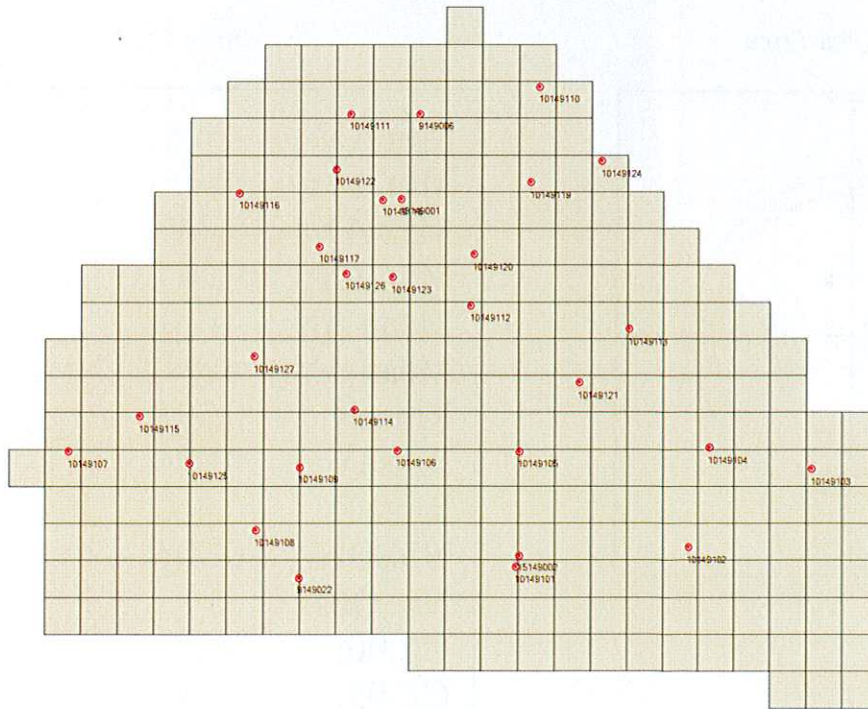
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Surdex Corporation
Date of Aquisition: Start: 3/7/2015 Finish: 4/1/2015

Metadata Information

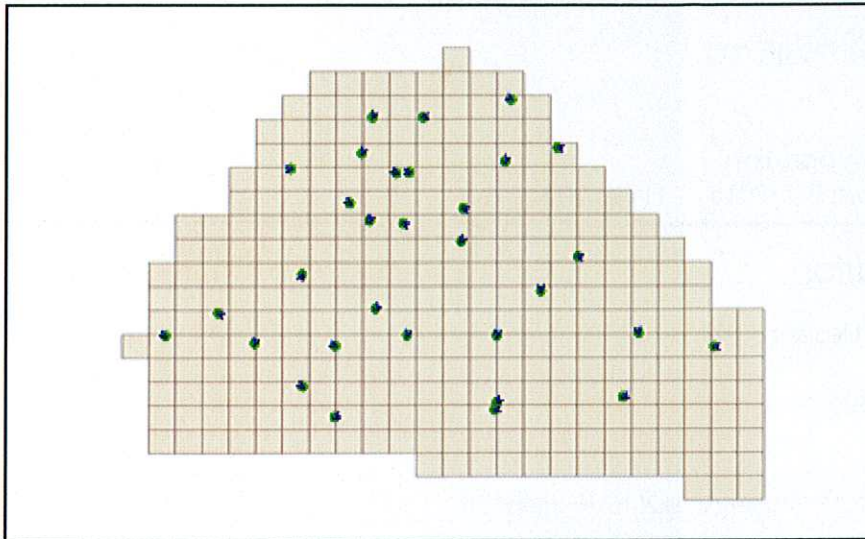
Index File Name: polk_files.shp
of Polygons: 305
of Matching Images: 305
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015_imagery\Polk2015\Imagery\Tiff
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



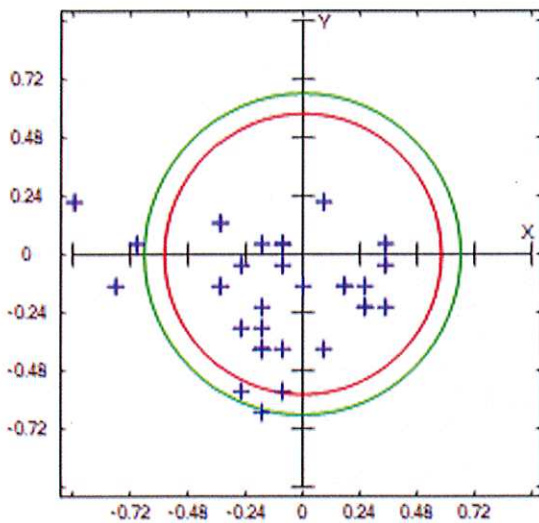


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-0.955
Min ΔY :	-0.651
Max ΔX :	0.347
Max ΔY :	0.217
Mean ΔX :	-0.104
Mean ΔY :	-0.172
RmseX:	0.328
RmseY:	0.28
RmseH:	0.431
NSSDA:	0.746
No. Obs.:	31
CE 90:	0.58
CE 95:	0.661
CI:	0.095

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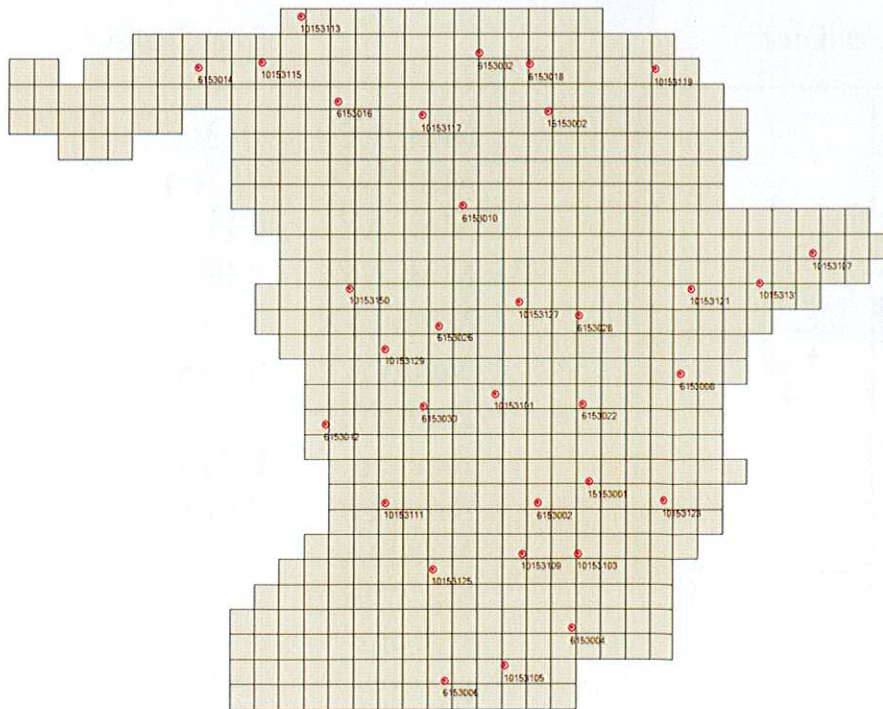
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Quantum Spatial, Inc.
Date of Aquisition: Start: 3/8/2015 Finish: 4/1/2015

Metadata Information

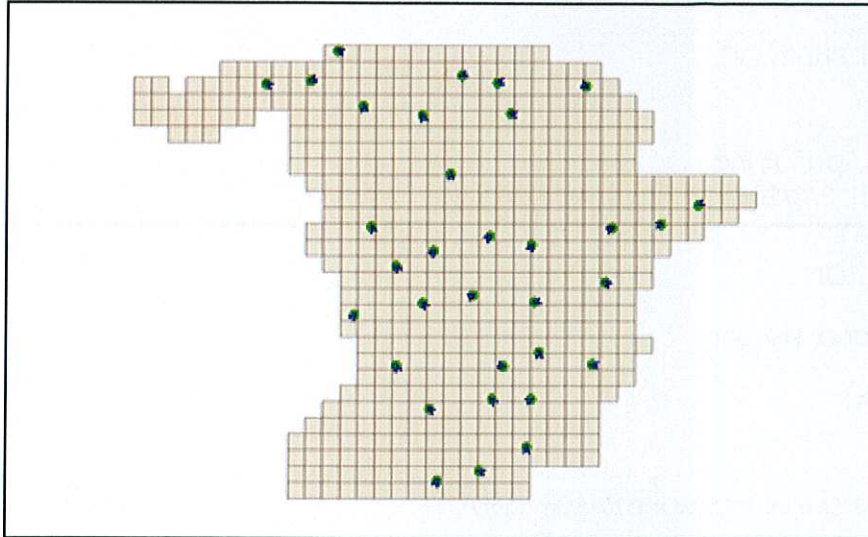
Index File Name: richmond_files.shp
of Polygons: 551
of Matching Images: 551
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015Aerial\RICHMOND2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



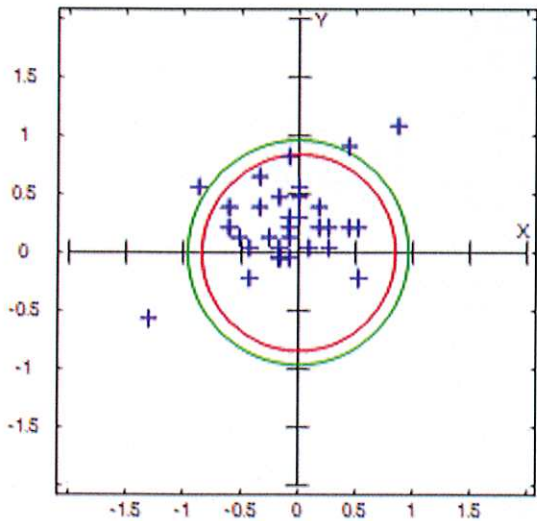


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-1.302
Min ΔY :	-0.564
Max ΔX :	0.868
Max ΔY :	1.085
Mean ΔX :	-0.079
Mean ΔY :	0.238
RmseX:	0.442
RmseY:	0.414
RmseH:	0.606
NSSDA:	1.048
No. Obs.:	33
CE 90:	0.843
CE 95:	0.961
CI:	0.134

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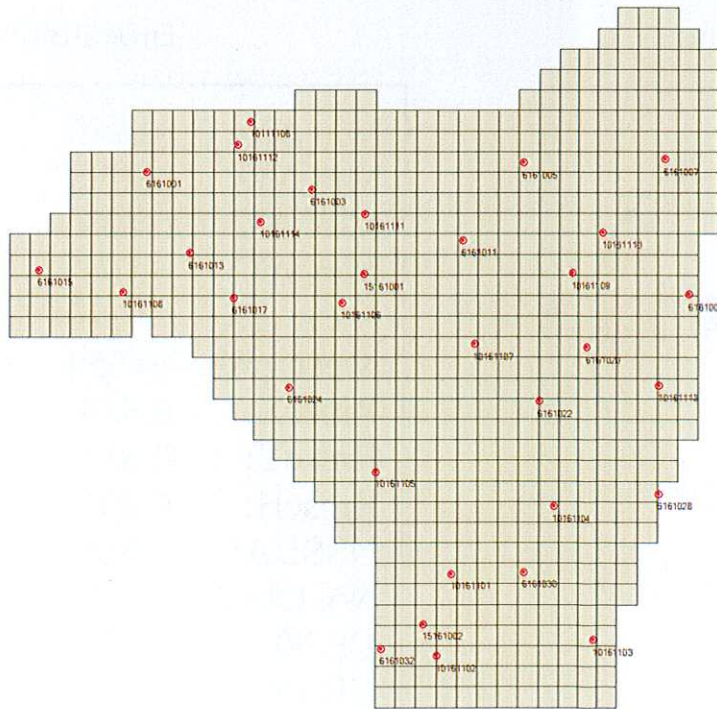
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Surdex Corporation
Date of Aquisition: Start: 3/7/2015 Finish: 4/1/2015

Metadata Information

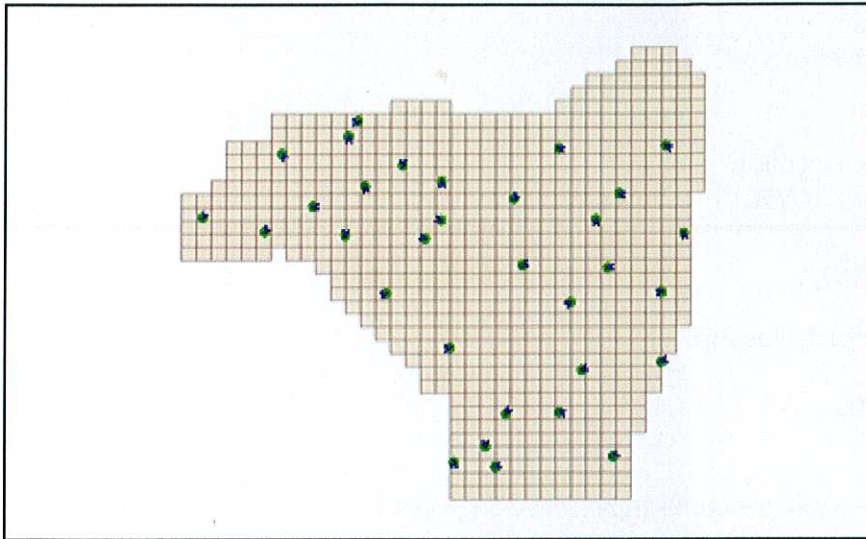
Index File Name: rutherford_files.shp
of Polygons: 700
of Matching Images: 700
Polygon ID: filename
Units: Feet
Image Folder Path: G:\imagery2015\RUTHERFORD2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



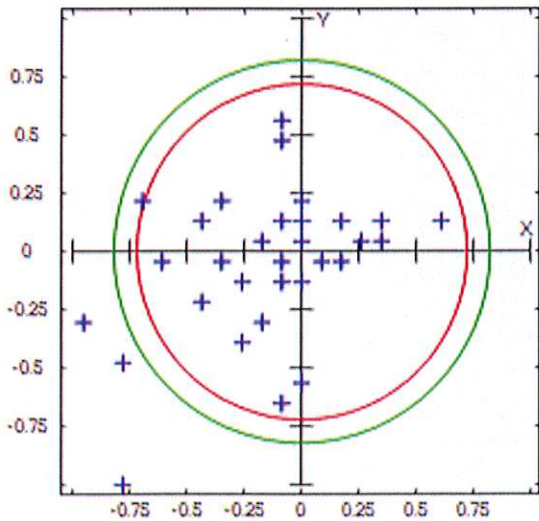


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-0.955
Min ΔY :	-0.998
Max ΔX :	0.608
Max ΔY :	0.564
Mean ΔX :	-0.149
Mean ΔY :	-0.054
RmseX:	0.379
RmseY:	0.317
RmseH:	0.494
NSSDA:	0.855
No. Obs.:	32
CE 90:	0.72
CE 95:	0.822
CI:	0.116

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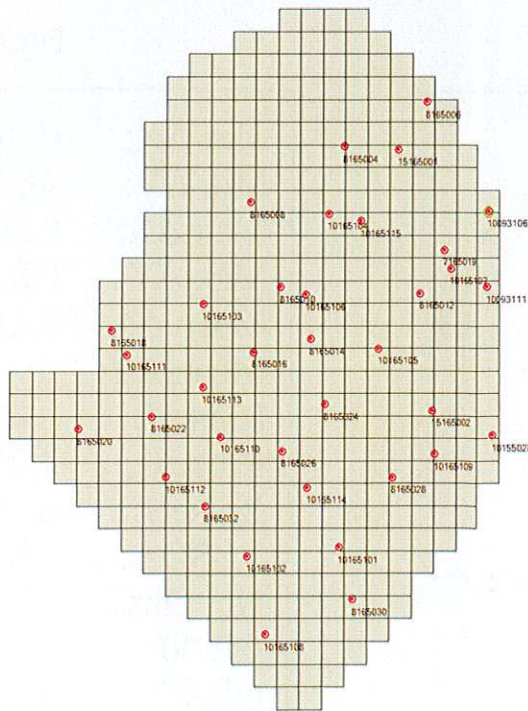
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Quantum Spatial, Inc.
Date of Acquisition: Start: 3/29/2015 Finish: 4/1/2015

Metadata Information

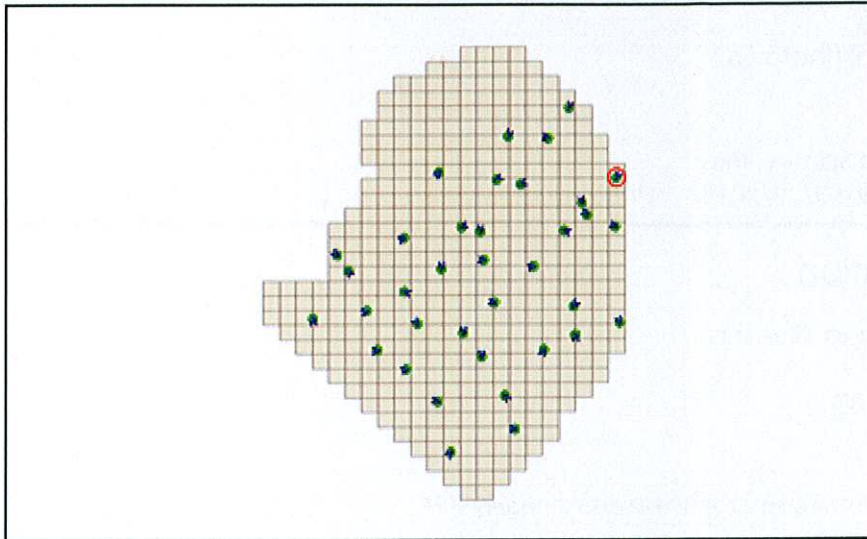
Index File Name: scotland_files.shp
of Polygons: 437
of Matching Images: 437
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015Aerial\SCOTLAND2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



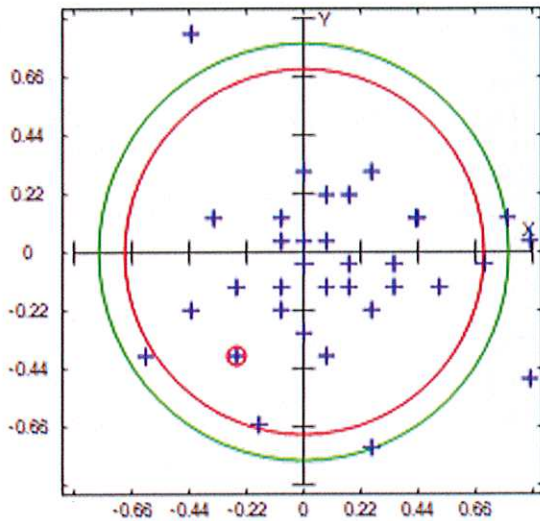


Vector Offset



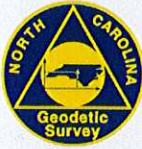
Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-0.608
Min ΔY :	-0.738
Max ΔX :	0.868
Max ΔY :	0.825
Mean ΔX :	0.113
Mean ΔY :	-0.065
RmseX:	0.368
RmseY:	0.291
RmseH:	0.469
NSSDA:	0.812
No. Obs.:	36
CE 90:	0.69
CE 95:	0.787
CI:	0.105



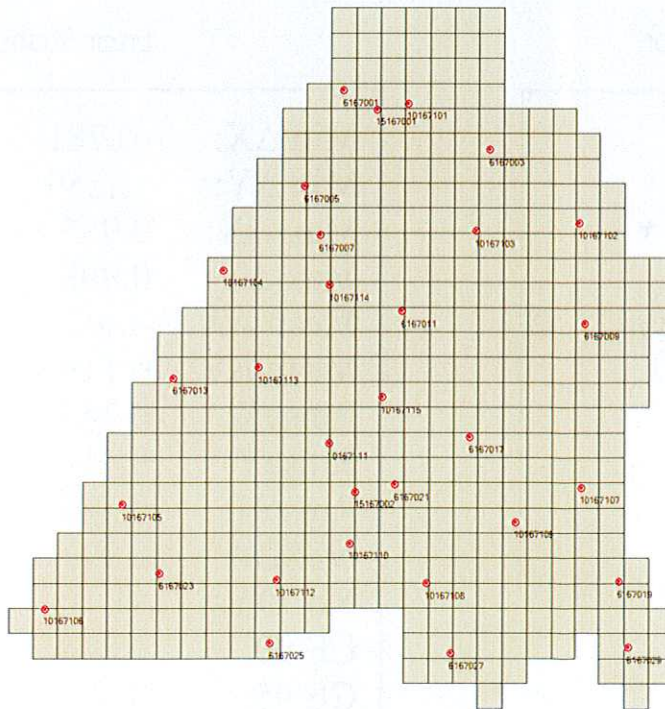
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Spatial Data Consultants, Inc.
Date of Aquisition: Start: 2/11/2015 Finish: 3/8/2015

Metadata Information

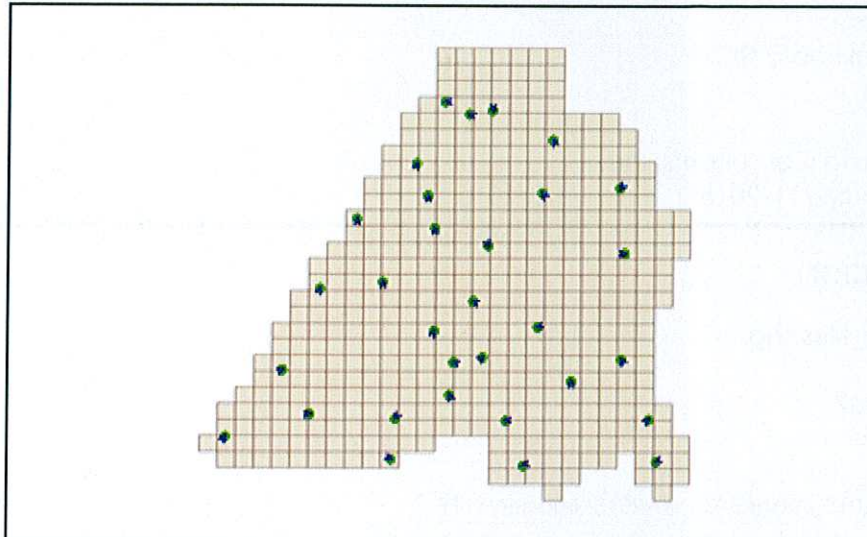
Index File Name: stanly_files.shp
of Polygons: 467
of Matching Images: 467
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015_imagery\Stanly2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



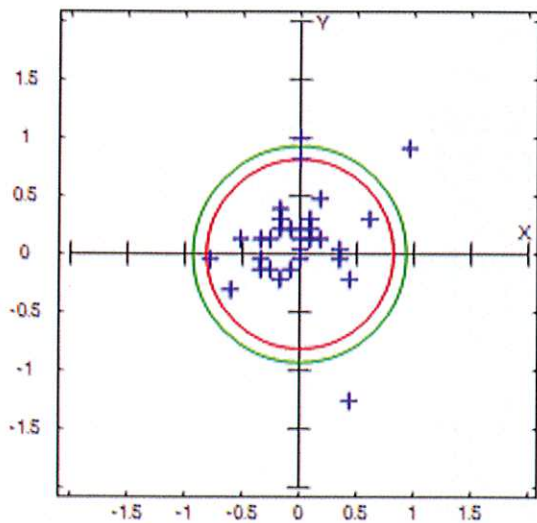


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-0.781
Min ΔY :	-1.259
Max ΔX :	0.955
Max ΔY :	0.998
Mean ΔX :	-0.02
Mean ΔY :	0.119
RmseX:	0.353
RmseY:	0.413
RmseH:	0.543
NSSDA:	0.94
No. Obs.:	31
CE 90:	0.816
CE 95:	0.931
CI:	0.134

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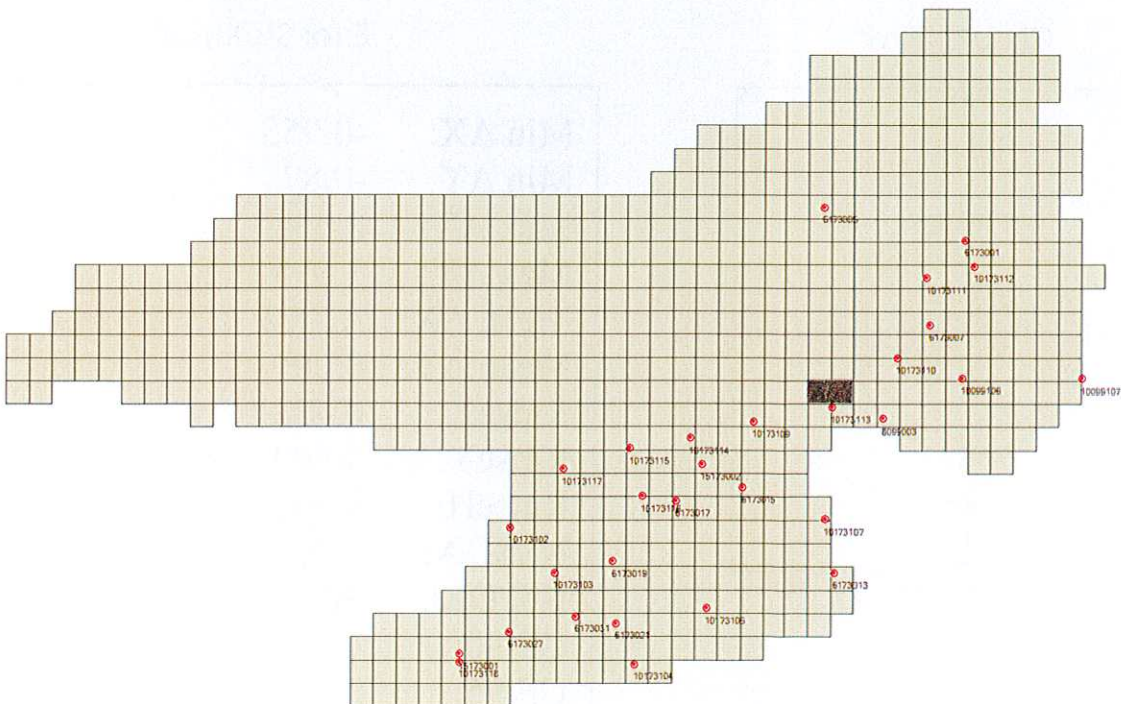
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: The Sanborn Map Company, Inc.
Date of Aquisition: Start: 3/7/2015 Finish: 4/5/2015

Metadata Information

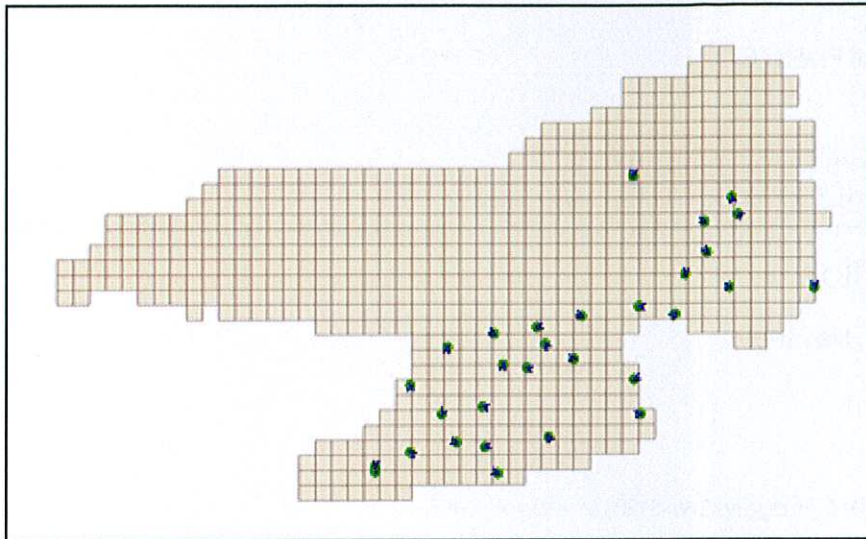
Index File Name: swain_tiles.shp
of Polygons: 710
of Matching Images: 710
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015_imagery\SWAIN2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area



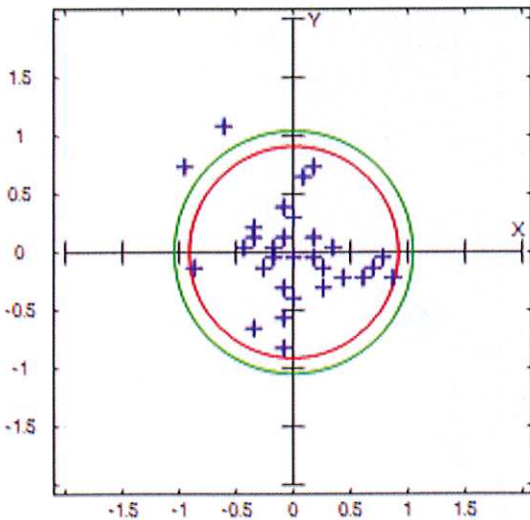


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-0.955
Min ΔY :	-0.825
Max ΔX :	0.868
Max ΔY :	1.085
Mean ΔX :	-0.003
Mean ΔY :	0.009
RmseX:	0.428
RmseY:	0.409
RmseH:	0.592
NSSDA:	1.025
No. Obs.:	30
CE 90:	0.914
CE 95:	1.042
CI:	0.152

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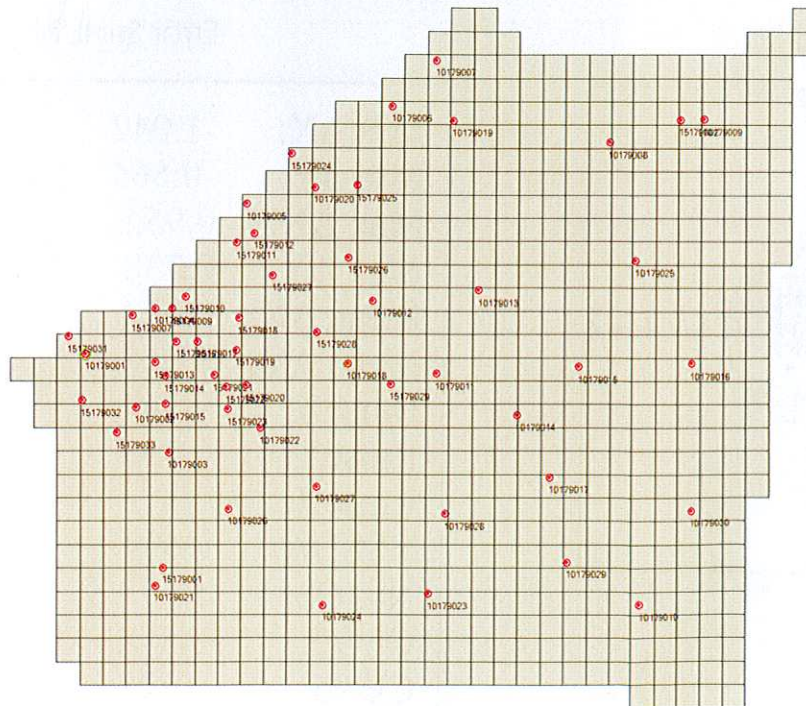
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Spatial Data Consultants, Inc.
Date of Acquisition: Start: 2/13/2015 Finish: 3/16/2015

Metadata Information

Index File Name: union_tiles.shp
of Polygons: 754
of Matching Images: 754
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015_imagery\Union2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area

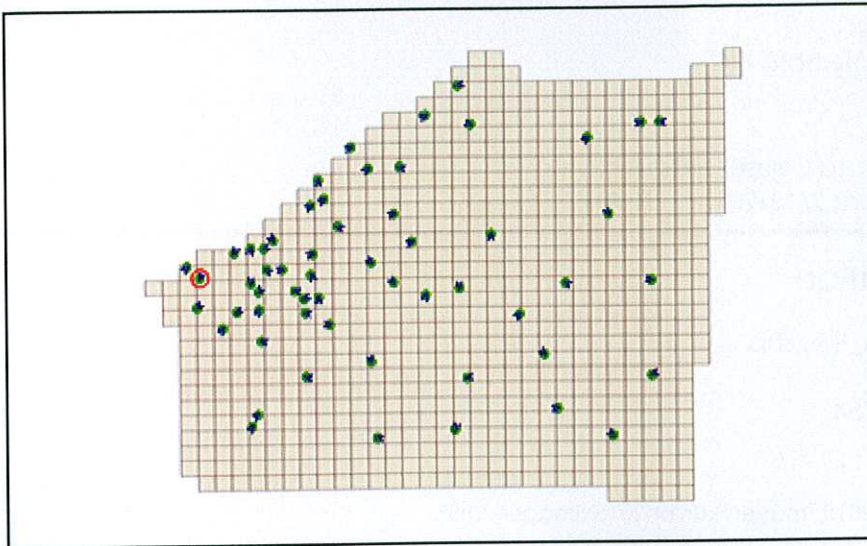


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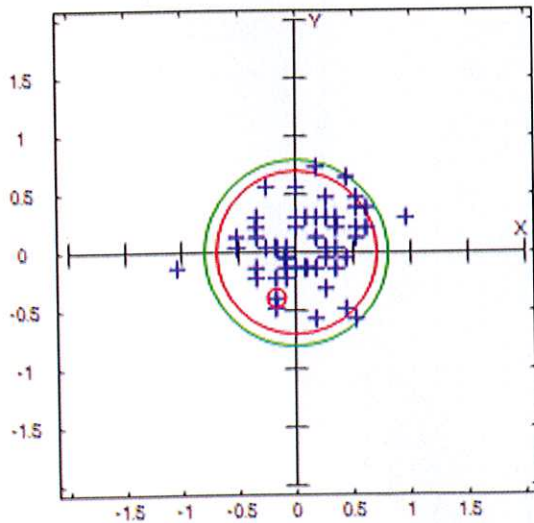


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-1.042
Min ΔY :	-0.564
Max ΔX :	0.955
Max ΔY :	0.738
Mean ΔX :	0.073
Mean ΔY :	0.068
RmseX:	0.364
RmseY:	0.298
RmseH:	0.47
NSSDA:	0.814
No. Obs.:	57
CE 90:	0.7
CE 95:	0.798
CI:	0.085

NORTH CAROLINA GEODETIC SURVEY

Claude T Bowers Building
4105 Reedy Creek Road
Raleigh, North Carolina 27607
(919)733-3836



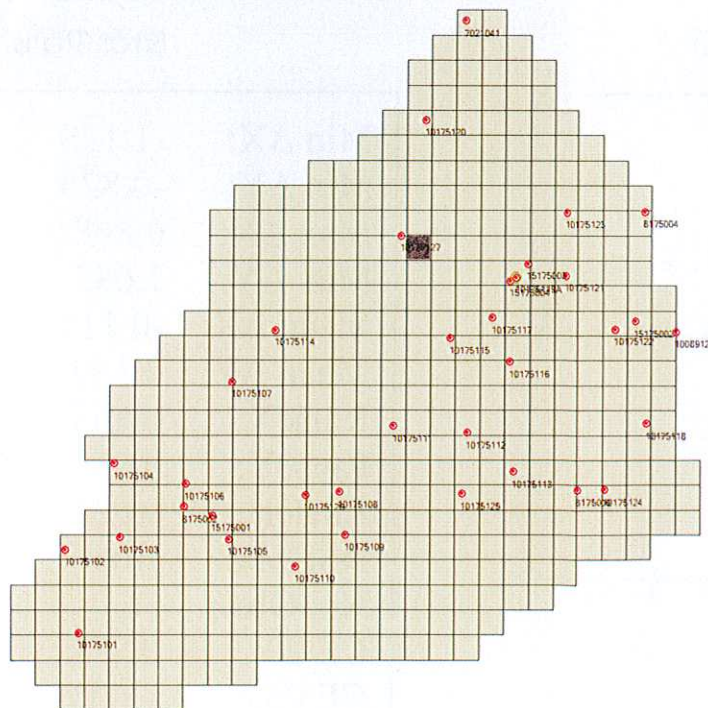
Project Information

Prepared By: Watson Ross
Project Name: 2015 Aerial Photo QC
Sensor Info: N/A
Sensor Resolution: 0.5
Vendor Name: Atlas Geographic Data, Inc.
Date of Aquisition: Start: 3/29/2015 Finish: 4/1/2015

Metadata Information

Index File Name: transylvania_tiles.shp
of Polygons: 466
of Matching Images: 466
Polygon ID: filename
Units: Feet
Image Folder Path: G:\2015_imagery\Transylvania2015\Imagery\TIFF
Threshold: Other: 1.5
Scaling Used: 1:100

Tiled-Image Area

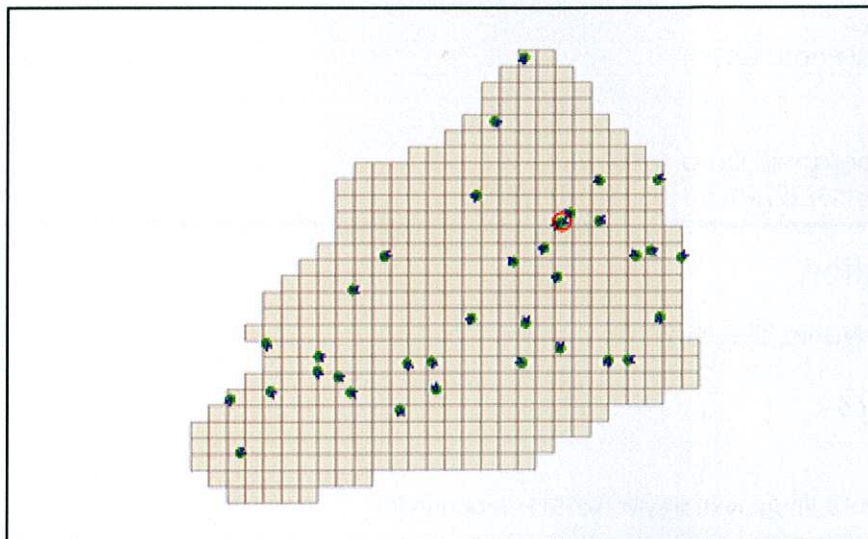


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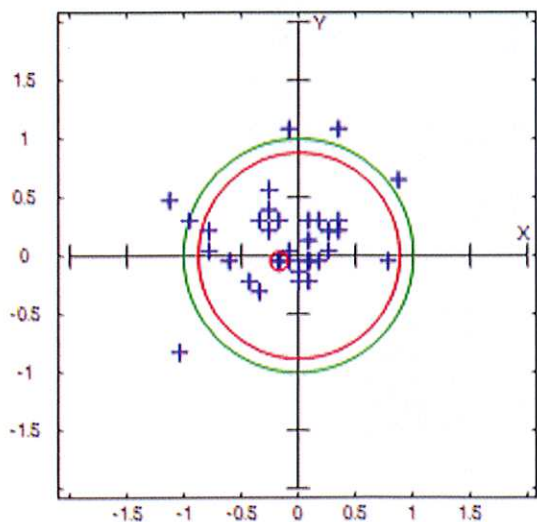


Vector Offset



Scaling Factor: 200

Circular Error



Error Statistics

Min ΔX :	-1.128
Min ΔY :	-0.825
Max ΔX :	0.868
Max ΔY :	1.085
Mean ΔX :	-0.111
Mean ΔY :	0.159
RmseX:	0.463
RmseY:	0.393
RmseH:	0.607
NSSDA:	1.05
No. Obs.:	36
CE 90:	0.879
CE 95:	1.003
CI:	0.134

Station Name	PID	Ellipsoid	NAVD88	NAD83(2011) Epoch		SPC North (m)	SPC East (m)	SPC Combined
		Height (m)	Orthometric Height (m)	2010.0 Latitude DMS	Longitude DMS			
MURPHY CORS ARP	DL1890	504.810	476.123	35 04 06.77760 N	083 57 59.36142 W	157594.804	156842.278	0.99980296
ROBBINSVILLE CORS ARP	DM3993	635.150	606.659	35 19 15.69235 N	083 47 48.68948 W	184808.885	173646.886	0.99977812
BRYSON CITY CORS ARP	DL2762	594.790	566.148	35 22 21.56251 N	083 30 23.37131 W	189293.916	200277.527	0.99978597
SW COMMUNITY COLL CORS ARP	DH3874	673.650	645.113	35 20 52.40748 N	083 12 23.38897 W	185353.255	227392.744	0.99977276
FRANKLIN CORS ARP	DG4257	649.270	620.895	35 11 30.68622 N	083 23 41.74673 W	168802.916	209516.356	0.99977570
HAYWOOD CORS ARP	DE8228	838.220	809.314	35 31 35.39633 N	082 55 30.12730 W	204104.221	253736.164	0.99975705
PARI_OBS_NC_2008 CORS ARP	DM6192	909.630	880.094	35 12 06.96417 N	082 52 20.90284 W	167939.378	257095.138	0.99973486
NCBT		806.721	835.560	35 28 21.62542 N	082 53 40.58442 W	198028.964	256259.359	0.99975341
MARSHALL CORS ARP	DG7400	590.850	560.633	35 48 47.31356 N	082 41 22.67321 W	235064.443	276250.707	0.99983251
BURNSVILLE 2007 CORS ARP	DL6201	778.830	748.693	35 54 29.30454 N	082 20 49.87834 W	244501.699	307532.708	0.99982060
SWANNANOVA CORS ARP	DG5311	689.830	659.842	35 35 46.03847 N	082 52 24.22964 W	210140.053	299464.372	0.99978706
HENDERSONVILLE CORS ARP	DK7853	684.850	654.472	35 21 21.89173 N	082 30 03.99653 W	183772.967	291488.002	0.99977154
NEWLAND 2007 CORS ARP	DM3991	1155.410	1124.527	36 04 39.95811 N	081 54 40.29398 W	262073.985	347419.061	0.99979994
MARION CORS ARP	DE8230	398.800	366.984	35 39 13.38510 N	081 57 16.17206 W	215162.325	342120.619	0.99983954
SPINDALE CORS ARP	DK4043	334.650	302.765	35 21 55.83430 N	081 54 57.34807 W	183099.887	344671.752	0.99982704
MORGANTON CORS ARP	DH7137	377.000	344.831	35 42 27.07386 N	081 39 23.99857 W	220367.093	369236.777	0.99985003
HICKORY CORS ARP	DM3523	358.510	326.299	35 44 31.01014 N	081 18 30.93483 W	223397.889	400811.751	0.99985789
SHELBY CORS ARP	DG7404	296.210	264.465	35 16 53.64241 N	081 29 28.11569 W	172739.799	383023.692	0.99983123
STATESVILLE CORS ARP	DK7549	261.190	228.842	35 51 19.72891 N	080 50 55.47790 W	235120.895	442629.732	0.99989208
MOORESVILLE CORS ARP	DH3838	297.570	266.205	35 34 46.87707 N	080 48 12.53662 W	204453.424	446161.276	0.99984714
GASTON CORS ARP	DE8425	245.140	213.712	35 18 39.79151 N	081 11 19.54124 W	175361.640	410593.642	0.99983959
I77 WELCOME CNTR CORS ARP	DF6318	187.950	157.556	35 07 21.25422 N	080 54 58.46768 W	153944.753	434964.997	0.99985039
NC49 BASE ARP	DP7098	209.768	240.180	35 18 24.69907 N	080 43 48.70762 W	174073.643	452274.604	0.99984013
MONROE CORS ARP	DF5880	174.600	144.332	34 58 54.77687 N	080 31 25.79009 W	137720.671	470484.517	0.99986097
POLKTON CORS ARP	DG7402	115.530	84.929	34 59 33.17297 N	080 10 37.85763 W	138473.153	502143.744	0.99986944
ROCKINGHAM CORS ARP	DM3995	122.950	91.872	34 57 51.98780 N	079 47 47.74087 W	135010.039	536859.244	0.99987067
NCRF		51.567	84.270	34 58 45.00929 N	79 13 04.01644 W	136373.746	589717.557	0.99987575
CARTHAGE CORS ARP	DG5938	181.000	149.613	35 20 30.04880 N	079 23 05.08515 W	176632.942	574629.599	0.99985034
TROY CORS ARP	DK4045	174.590	144.044	35 22 01.84517 N	079 52 12.77094 W	179740.437	530528.389	0.99985200
ASHEBORO 2 CORS ARP	DL6900	240.790	210.381	35 37 49.38501 N	079 45 53.75304 W	208859.939	540319.797	0.99986134
HIGH POINT CORS ARP	AI4198	299.220	267.948	35 57 56.48686 N	080 00 48.93737 W	246260.723	518178.455	0.99990805
LEXINGTON CORS ARP	DG5757	225.340	194.102	35 48 53.14318 N	080 13 46.20206 W	229736.512	498497.891	0.99989030
SALISBURY CORS ARP	DN5840	206.250	174.906	35 42 41.69212 N	080 25 55.99488 W	218535.902	480015.188	0.99987726
JORDAN LAKE CORS ARP	DL3891	77.430	45.996	35 46 52.49646 N	079 02 03.92766 W	225330.877	606489.109	0.99990797
SANFORD CORS ARP	AM7024	127.140	95.450	35 28 24.67784 N	079 09 28.98436 W	191202.330	595258.352	0.99986507

Acronyms, Abbreviations, and Definitions

ARP - Antenna Reference Point

CORS - Continuous Operating Reference Station

DMS - Degrees Minutes Seconds

m – Meter

PID - Permanent Identifier

SPC - State Plane Coordinates

Statistical Definitions:

Min $\Delta X / \Delta Y$ – These statistics represent the change in value between the X(Y)-coordinate location in the photo and X(Y)-coordinate location in the survey. The minimum of each simply represents the smallest value out of all of the analyzed locations. This component of the statistics can be used to show which user entered locations most closely correspond to the surveyed points.

Max $\Delta X / \Delta Y$ – These statistics represent the change in value between the X(Y)-coordinate location in the photo and X(Y)-coordinate location in the survey. The maximum value of each represents the largest value out of all of the analyzed locations. Maximum values can be used to show which user entered locations most closely correspond to the surveyed points.

Mean $\Delta X / \Delta Y$ - The statistics of the mean ΔX and mean ΔY are intended to show the average values of the ΔX and ΔY . These statistics show the change in value between the X(Y)-coordinate location in the photo and X(Y)-coordinate location in the survey. The mean values can be used to show the average off-sets of all of the analyzed locations

RMSE X / Y / H - The RMSE is used to describe accuracy encompassing both random and systematic errors. RMSE is the square root of the square of the difference between a true test point and an interpolated test point divided by the total number of test points in the arithmetic mean. RMSE X measures RMSE in the X direction only, and similarly RMSE Y measures RMSE in the Y direction only. RMSE H takes both X and Y directions into account, and measures the RMSE in a straight line between the true test point and the interpolated test point.

NSSDA – Horizontal accuracy standard adopted by the National Standard for Spatial Data Accuracy, computed utilizing the $RMSE_x$ and $RMSE_y$ values.

No. Obs. – Number of observations

CE 90 and CE 95 - Circular Error probable, defined as a circle, centered about the mean, whose boundary is expected to include a certain percentage of the population within it. In the case of CE90, 90% of the population is expected to be included within the circular radius and in the case of CE95, 95% of the population is expected to be included within the circular radius.

CI – Confidence Interval, which describes the uncertainty associated with a sampling method.