Oneida County
LiDAR collection 2008-2009

LEWIS

OSWEGO

HAMILTON

ONEIDA

ROME

HERKIMER

NYS funded

FEMA HMTAP

UTICA

ONEIDA

SHERRILL

County funded

SYRACUSE

ONONDAGA

MADISON

OTSEGO

OTSEGO

OTSEGO
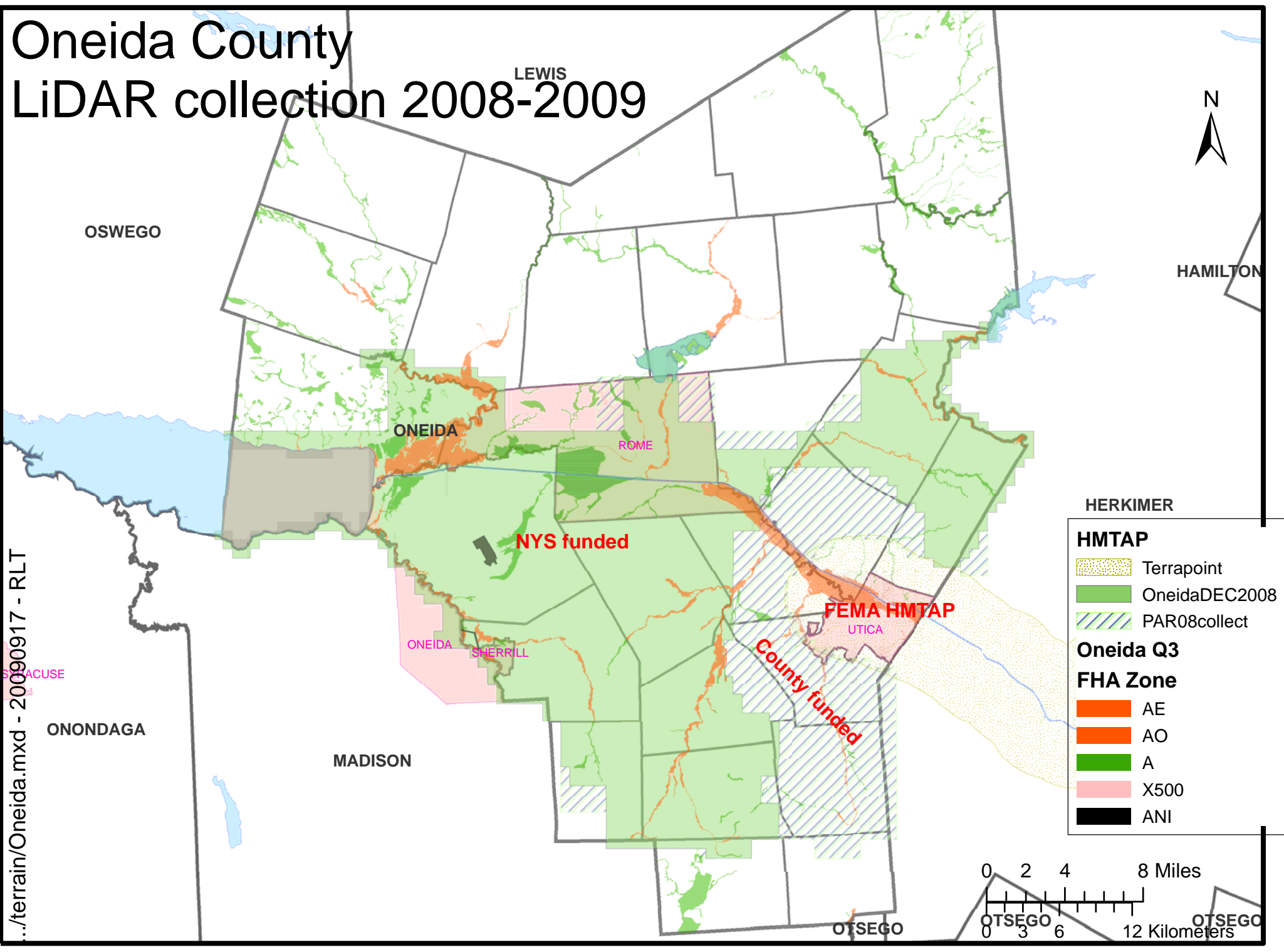
.../terrain/Oneida.mxd - 20090917 - RLT

N

HMTAP
- Terrapoint
- OneidaDEC2008
- PAR08collect

Oneida Q3
FHA Zone
- AE
- AO
- A
- X500
- ANI

0 2 4   8 Miles

0 3 6   12 Kilometers

ρar
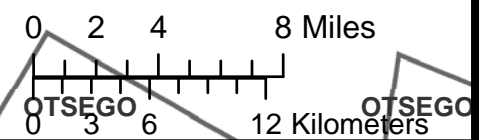
8 May 2009

Jeff Quackenbush
Herkimer-Oneida Counties Comprehensive Planning
Boehlert Center @ Union Station
321 Main Street – Third Floor
Utica, NY 13502

Subject: Oneida County LiDAR-based Terrain Elevation Data Project

Dear Jeff,

     In accordance with the terms of the subject contract, PAR Government Systems is pleased to submit the following deliverable: One (1) hard drive containing approximately 609 square miles of Multiple Return LiDAR data (LAS format), the Quality Control Report, and GIS DEM products.

     Should you have questions of a contractual nature you may contact the undersigned at 315-356-2266. All other questions/requests can be directed to Verne LaClair at 315-356-2130.

Sincerely,

PAR GOVERNMENT SYSTEMS CORPORATION

Trisha Ri——

Trisha Rivers
Contract Administrator

cc: Elisabetta DeGironimo - MVWA
Tim Daly - NYSDEC

par® Government Systems Corporation

LiDAR QA-QC

Project Name: 2008 Oneida County LiDAR	Project Number: 313179
Producer: V LaClair	Completion Date: 1/14/09

Original : ☒　　　　**Rework:** ☐

Item	Topic	QC Findings/Comments	
1	LiDAR Vendor	Sanborn Map Company	
2	Sensor System	Optech ALTM 2050, Leica ALS50	
3	Source Media Identification	Maxtor External Hard Drive	
4	Delivery Media File Contents (Yes/No)	Readme Files:	No
		Supporting Metadata Files:	Yes
		Random Point Files:	No
		Grid Files:	No
		Other Files:	LAS 1.1 (2,533 Tiles)
		Incremental Delivery:	No
5	Key Dates	Aerial Acquisition Dates:	4/30/08-5/09/08
		Vendor Processing Dates:	8/15 – 10/03/08
		Source Media Date:	8/15 - 10/22/08
		Received Date:	10/30/2008
6	Coverage Extents	**Refernce Attached**	
7	Collection Area (in square miles)	Requirement:	563 sq miles
		Delivered:	550 sq miles
8	Total Number of LIDAR Points	Number of Random Points:	1,150,460,500 BE
		Number of Total Points:	3,039,600,000
9	Average Point Density (Random Data)	1.0 - 1.4 meters	
10	Confirm compliance of projection, vertical or horizontal datum, and units of measure (Yes/No)	UTM Zone: 18N	yes
		NAD83:	yes
		NAVD88:	yes
		Meters:	yes
11	Confirm completeness of vendor processing	Confirmed see attached map	
12	Elevation Values Round-off Check		
13	Range of Elevation Values	Random:	107 meters to 591 meters

Oneida County LiDAR Tile Grid

2,533 750m x 750m LAS V1.1 Tiles (550 Sq Miles)

63 HMTAP Tiles - Spring 2007 (39.5 Sq Miles)

Rome

Herkimer County

Madison County

Oneida

Sherrill

Utica
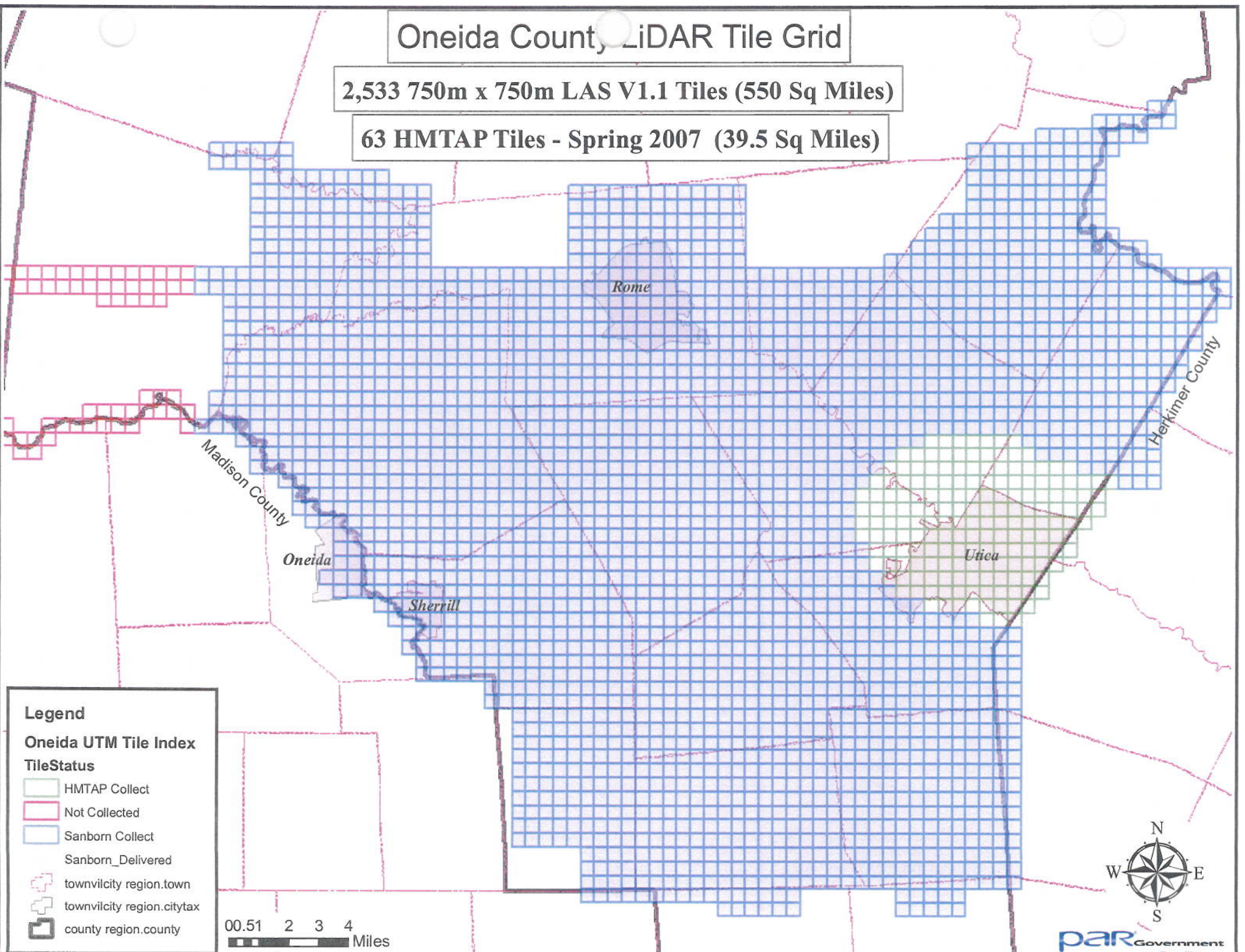
Legend

Oneida UTM Tile Index

TileStatus

HMTAP Collect

Not Collected

Sanborn Collect

Sanborn_Delivered

townvilcity region.town
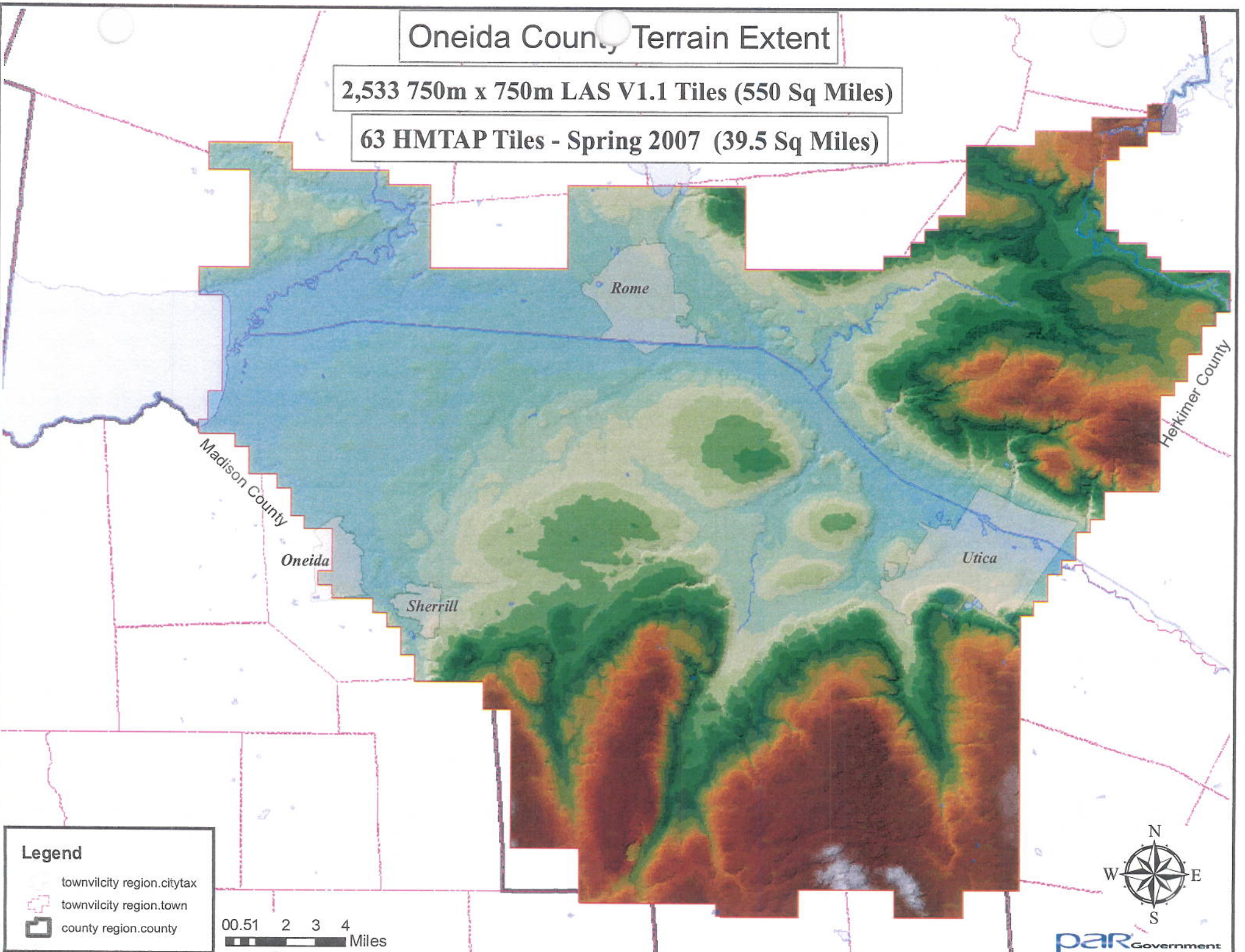
townvilcity region.citytax

county region.county

0 0.5 1   2   3   4
Miles

N
W E
S

par Government

Oneida County Terrain Extent

2,533 750m x 750m LAS V1.1 Tiles (550 Sq Miles)

63 HMTAP Tiles - Spring 2007 (39.5 Sq Miles)

Rome

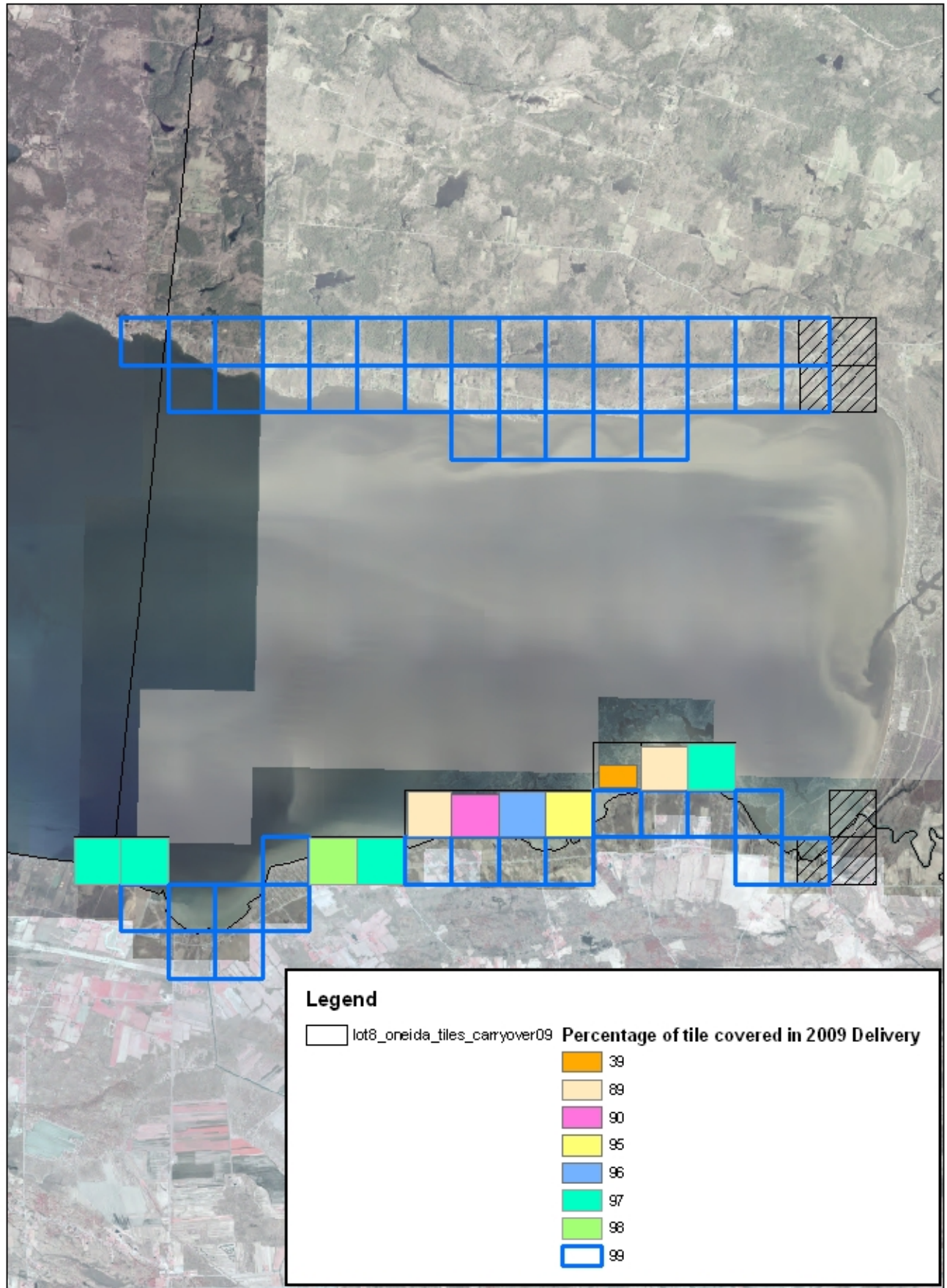Madison County

Herkimer County

Oneida

Utica

Sherrill

Legend

townvilcity region.citytax

townvilcity region.town

county region.county

00.51 2 3 4 Miles

N
W E
S

par Government

Oneida County LIDAR - Tiles Carried over to 2009

Legend

☐ lot8_oneida_tiles_carryover09

Percentage of tile covered in 2009 Delivery

🟧	39
⬜	89
🟥	90
🟨	95
🟦	96
🟩	97
🟩	98
☐	99

Oneida County 2009 LiDAR Data Collection, NY (NYSDEC)

LAS_Binary v1.1

FGDC, ESRI Metadata

Show Definitions

| Description | Spatial | Data Structure | Data Quality | Data Source | Data Distribution | Metadata |

- Resource Description

Citation   NOTE: this is the metadata produced by Sanborn and delivered
       with the 2009 collected LAS tiles –RLT 20091005.

Title: Oneida County 2009 LiDAR Data Collection, NY (NYSDEC)

Originators: New York State Department of Environmental Conservation, Division of Water, Watershed GIT Support Group

Publisher: NYSDEC

Publication place: Albany, NY

Publication date: 20090921

Data type: tabular digital data

Description

Abstract: Summary of the surface elevation data collection project in Oneida County, NY (NYSDEC) 2009. Products generated include LiDAR point data in LAS Binary format v1.1.

Purpose: Support of FEMA's Floodplain Map Modernization Program. Multiple other uses expected.

Supplemental information: In the spring of 2009, the Sanborn Map Company, Inc. (Sanborn) acquired 20 square miles of terrestrial LiDAR data in Oneida County, NY. The Leica ALS50 Airborne LiDAR sensors were used for the collection of Oneida County, NY only. The LiDAR data associated with this metadata file is in LAS binary format, version 1.1 (ASPRS specification, see Cross References).

Language of dataset: en

Point Of Contact

Organization: New York State Department of Environmental Conservation, Division of Water

Phone: 518-402-8185

Email: watergis@gw.dec.state.ny.us

Address type: mailing and physical address

   Address: 625 Broadway, 4th floor

   City: Albany

   State or Province: NY

   Postal code: 12233-3504

   County: USA

Data Type

Data type: tabular digital data

Data format: LAS_Binary v1.1

Native dataset environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 3; ESRI ArcCatalog 9.2.4.1420

Time Period of Data

Beginning date: 20090502

Ending date: 20090502

Currentness reference: ground condition

Status

Data status: Complete

Update frequency: None planned

Key Words

Theme:

Keywords: LiDAR Point Cloud, LiDAR

Keyword thesaurus: EDI Thesaurus

Theme:

Keywords: elevation, 006

Keyword thesaurus: ISO 19115 Topic Category

Theme:

Keywords: EARTH SCIENCE > Land Surface > Topography > Terrain Elevation

Keyword thesaurus: GCMD Science Keywords

Theme:

Keywords: custodial

Keyword thesaurus: none

Place:

Keywords: New York, Oneida

Keyword thesaurus: Geographic Names Information System

Data Access Constraints

Access constraints: None

Use constraints: 1. The NYS DEC asks to be credited in derived products.
2. Secondary Distribution of the data is not allowed.
3. Any documentation provided is an integral part of the data set. Failure to use the documentation in conjunction with the digital data constitutes misuse of the data.
4. Although every effort has been made to ensure the accuracy of information, errors may be reflected in the data supplied. The user must be aware of data conditions and bear responsibility for the appropriate use of the information with respect to possible errors, original map scale, collection methodology, currency of data, and other condidions.

Data Security Information

Security classifiction system: NYSDEC Classification System Aug.06

Security classification: Unclassified

Security handling: None

Cross Reference

Title: FEMA Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix A: Guidance for Aerial Mapping and Surveying

Originators: Federal Emergency And Management (FEMA)

Publisher: FEMA

Publication place: Washington, DC

Publication date: 20030430

Data type: document

Data location:
http://www.fema.gov/library/file;jsessionid=D0EF44533EDCE583281BE729E8827AA3.WorkerLibrary?
type=publishedFile&file=frm_gsaa.pdf&fileid=67b09a60-95e8-11db-b057-000bdba87d5b

Other citation details: In Guidelines and Specifications for Flood Hazard Mapping Partners, FEMA defines technical requirements, product specifications for Flood Hazard Maps and related National Flood Insurance Program (NFIP) products, and associated coordination and documentation activities.

Cross Reference

Title: Oneida County Network Survey

Originators: Sanborn

Publisher: Sanborn

Publication place: 1935 Jamboree Drive, Colorado Springs, CO 80920

Publication date: 20080523

Data type: document

Other citation details: Oneida County network adjustment results can be found in the document titled "OneidaCo_AdjustReport.html" On record at Sanborn, 1935 Jamboree Dr. Suite 100, Colorado Springs, CO 80920

Cross Reference

Title: Oneida NGS Datasheets

Originators: National Geodetic Survey

Publisher: National Geodetic Survey

Publication place: Silver Spring, MD

Publication date: 20080221

Data type: document

Data location: http://www.ngs.noaa.gov/cgi-bin/ds_pid.prl

Other citation details: The following NGS control stations were used in the network survey and aerial data collection for the Oneida County LiDAR campaign:
OE0678; AA7914; OE1686; AA7945

Information on these control stations can be found on the NGS datasheets.

Cross Reference

Title: LiDAR Exchange Format - LAS version 1.1

Originators: American Society for Photogrammetry & Remote Sensing

Publisher: The American Society for Photogrammetry & Remote Sensing

Publication place: Bethesda, Maryland 20814-2160

Publication date: 20050307 *Publication time:* Unknown

Data type: document

Data location: http://www.asprs.org/society/committees/standards/asprs_las_format_v11.pdf

Other citation details: All information regarding the LAS file format and attribution information can be found in the .pdf file titled "LAS Specification Version 1.1 March 07, 2005"

- Spatial Reference Information

Horizontal Coordinate System

Projected coordinate system:
　Name: NAD 1983 UTM Zone 18N
　Map units: meters
Geographic coordinate system:
　Name: GCS North American 1983

Coordinate System Details

Grid coordinate system

　Grid coordinate system name: Universal Transverse Mercator
　Universal Transverse Mercator:
　　UTM zone number: 18
　　Transverse Mercator:
　　　Scale factor at central meridian: 0.999600
　　　Longitude of central meridian: -75.000000
　　　Latitude of projection origin: 0.000000

False easting: 500000.000000
False northing: 0.000000

Planar Coordinate Information

Planar coordinate encoding method: coordinate pair
Coordinate representation:
   Abscissa resolution: 0.01
   Ordinate resolution: 0.01
Planar distance units: meters

Geodetic model

Horizontal datum name: North American Datum of 1983
Ellipsoid name: Geodetic Reference System 80
Semi-major axis: 6378137.000000
Denominator of flattening ratio: 0.2982572221010

Vertical Coordinate System

Altitude system definition:
   Altitude datum name: North American Vertical Datum of 1988 (Geoid03)
   Altitude resolution: 0.01
   Altitude distance units: meters
   Altitude encoding method: Implicit coordinate

Spatial Domain

Bounding Coordinates

In Projected or local coordinates

NAD 1983 UTM Zone 18N

Boundary	Coordinate
Left	585000.000000 (meters)
Right	604500.000000 (meters)
Top	4595250.000000 (meters)
Bottom	4574250.000000 (meters)

In Unprojected coordinates (geographic)

GCS North American 1983

Boundary	Coordinate
West	42.7450 (longitude)
East	43.9551 (longitude)
North	47.87300 (latitude)
South	47.76700 (latitude)

- Data Structure and Attribute Information

Overview

Dataset overview: Raw LAS binary
NAD83 UTM Zone 18, NAVD88 - Geiod03 - Meters
LAS Version 1.1
Classification:
1 - Unclassified

2 - Bare Earth
7 - Low Points
12 - Overlap

Entity and attribute detailed citation: The LAS file is version 1.1 (see ASPRS LAS 1.1 cross reference) and includes the following information at the file level: GUID (project identifier), file creation day and year, Variable Length Records (VLR) which include file projection information. The LAS 1.1 file contains the following information at the point level: Grid coordinate (x,y,z), 8-bit intensity value, return number, scan direction, classification value, Point Source ID (flight-line delineator), GPS Time (GPS seconds of the week). The Point Source ID is an arbitrarily assigned number that is only used to delineate LAS data between different LiDAR scans. The Point Source IDs in this dataset were incremented in chronological order following the LiDAR collection. That is to say line No. 36 was collected after line No. 35. GPS seconds of the week are referenced to UTC time and begin at 00:00:01 Sunday morning and end at 24:00:00 Saturday midnight.

Direct spatial reference method: Point

Attributes of Airborne LiDAR Data Point Records

Description: LiDAR for Oneida County, NY

Source: Sanborn

Attributes

Classification

Definition: Standard ASPRS classifications as defined in the values below.

Attribute value accuracy: N/A

Attribute value accuracy explanation: N/A

Attribute measurement frequency: Irregular

Beginning date of attribute values: 20080504

Ending date of attribute values: 20080507

Attribute domain values

Value	Definition
1	Unclassified Point
	Definition Source: Sanborn
2	Bare Earth Point
	Definition Source: Sanborn
7	Low Points (noise) - Outlyer Point Class
	Definition Source: Sanborn
12	Overlap: Flight Line Overlap Point
	Definition Source: Sanborn

Attribute definition source: LAS Version 1.1, POINT DATA RECORD FORMAT

Elevation

Definition: Grid Z Coordinate

Attribute value accuracy: 0.185 m RMSE

Attribute value accuracy explanation: Bare Earth points checked against ground control points in flat, open terrain

Attribute measurement frequency: Irregular

Beginning date of attribute values: 20080504

Ending date of attribute values: 20080507

Attribute domain values

Value	Definition
N/A	Sanborn does not have at present tools to provide the min/max elevation across all classes or each class independently
	Definition Source: Sanborn

Attribute definition source: LAS Version 1.1, POINT DATA RECORD FORMAT

Intensity

Definition: 8-bit LiDAR return intensity value

Attribute value accuracy: N/A

Attribute value accuracy explanation: N/A

Attribute measurement frequency: Irregular

Beginning date of attribute values: 20080504

Ending date of attribute values: 20080507

Attribute domain range

Range	Value
Minimum	0
Maximum	255
Mean	N/A
Standard deviation	N/A
Attribute units of measurement	N/A
Attribute measurement resolution	1

Attribute definition source: LAS Version 1.1, POINT DATA RECORD FORMAT

Return Number

Definition: LiDAR Return Number

Attribute value accuracy: N/A

Attribute value accuracy explanation: N/A

Attribute measurement frequency: Irregular

Beginning date of attribute values: 20080504

Ending date of attribute values: 20080507

Attribute domain values

Value	Definition
1	First return
	Definition Source: Airborne LiDAR System
2	Second return
	Definition Source: Airborne LiDAR System
3	Third Return
	Definition Source: Airborne LiDAR System
4	Fourth Return
	Definition Source: Airborne LiDAR System

Attribute definition source: LAS Version 1.1, POINT DATA RECORD FORMAT

Scan Direction Flag

Definition: Denotes direction of scanner mirror at time of output pulse

Attribute value accuracy: N/A

Attribute value accuracy explanation: N/A

Attribute measurement frequency: Irregular

Beginning date of attribute values: 20080504

Ending date of attribute values: 20080507

Attribute domain values

Value	Definition
1	positive scan direction - mirror scanning to the right of aircraft along direction of flight
	Definition Source: Airborne LiDAR System
0	negative scan direction - mirror scanning to the left of aircraft along direction of flight
	Definition Source: Airborne LiDAR System

Attribute definition source: LAS Version 1.1, POINT DATA RECORD FORMAT

GPS Timestamp

Definition: GPS seconds of the week are referenced to UTC time and begin at 00:00:01 Sunday morning and end at 24:00:00 Saturday midnight.

Attribute value accuracy: N/A

Attribute value accuracy explanation: N/A

Attribute measurement frequency: Irregular

Beginning date of attribute values: 20080504

Ending date of attribute values: 20080507

Attribute domain range

Range	Value
Minimum	0
Maximum	604,799
Mean	N/A
Standard deviation	N/A
Attribute units of measurement	N/A
Attribute measurement resolution	0.000001

Attribute definition source: LAS Version 1.1, POINT DATA RECORD FORMAT

Point Source ID

Definition: The Point Source ID is an assigned number delineating flightline information. The point source ID is sequential and chronological in the order the flightlines were collected. The correlated point source ID is also found in the 'num' field of the associated flighline shapefiles: "2008_Oneida_LiDAR_Optech_Collect.shp" and "2008_Oneida_LiDAR_Leica_Collect.shp"

Attribute value accuracy: N/A

Attribute value accuracy explanation: N/A

Attribute measurement frequency: Irregular

Beginning date of attribute values: 20080504

Ending date of attribute values: 20080507

Attribute domain values

Value	Definition
1 - 127	flightline sequential number
	Definition Source: Terrasolid Limited

Attribute definition source: LAS Version 1.1, POINT DATA RECORD FORMAT

Total Returns by Pulse

Definition: The total number of returns for a given pulse. Directly follows Return Number attribute in the LAS file architecture.

Attribute value accuracy: N/A

Attribute value accuracy explanation: N/A

Attribute measurement frequency: Irregular

Beginning date of attribute values: 20080504

Ending date of attribute values: 20080507

Attribute domain values

Value	Definition
1	One total return for pulse
	Definition Source: Airborne LiDAR System
2	Two total returns for pulse
	Definition Source: Airborne LiDAR System
3	Three total returns for pulse
	Definition Source: Airborne LiDAR System
4	Four total returns for pulse
	Definition Source: Airborne LiDAR System

Attribute definition source: LAS Version 1.1, POINT DATA RECORD FORMAT

- Data Quality and Accuracy Information

General

Logical consistency report: The 2009 Oneida County LiDAR data associated with this metadata file has met all quality checks in terms of relative accuracy, absolute accuracy, coverage. and point and file format. The relative accuracy of the LiDAR data refers to how well the data set matches within itself. That is to say, adjacent LiDAR scans are in alignment with each other with no vertical or horizontal shifts caused by improper calibration and/or georeferencing. The absolute elevation has been validated by both Sanborn and NYS DEC. This was done by comparing the LiDAR ground surface against known ground control points. The data file format and point attribution is in compliance with the LAS version 1.1 specifications (see ASPRS LAS1.1 cross reference).

Completeness report: The 2009 Oneida County LiDAR data associated with this metadata file completely covers the project-specified boundary with no data voids caused by acquisition or sensor issues.

Attribute Accuracy

Attribute accuracy report: 1. LiDAR data was collected and processed in accordance with FEMA guidelines as published in Appendix A (see Cross References)
2. See vertical position accuracy below.

Positional Accuracy

Horizontal accuracy report: The LiDAR data horizontal accuracy is in compliance with the National Standard for Spatial Data Accuracy (NSSDA) RMSE estimation of elevation data in support of 2ft. contour mapping products as it is referenced in the FEMA guidelines for flood hazard mapping, appendix A (see Cross References).

Horizontal positional accuracy assessment:

Accuracy values

1.000 m RMSE

Explanation: Horizontal error associated with this LiDAR data set is a function of several factors including acquisition practices, height of the sensor above terrain, point spacing, diameter of the pulse footprint, network control station coordinates, kinematic GPS solutions, IMU calibration and post-processing functions.

Vertical accuracy report: The LiDAR data vertical accuracy is in compliance with the National Standard for Spatial Data Accuracy (NSSDA) RMSE estimation of elevation data in support of 2ft. contour mapping products as it is referenced in the FEMA guidelines for flood hazard mapping, appendix A (see Cross References). The Sanborn Map Company has performed a data accuracy validation and found this data to be in compliance. Additionally, The New York State Department of Environmental Conservation performed a ground control analysis of the Oneida LiDAR data using ground control checkpoints in several land cover classes and found the resultant RMSE in the exposed ground class to be within the contract specifications of 0.185 meters.

Vertical positional accuracy assessment:

Accuracy values

0.185 m RMSE

Explanation: Vertical error associated with this LiDAR data is a function of several factors including acquisition practices, height of the sensor above terrain, point spacing, diameter of the pulse footprint,

network control station coordinates, kinematic GPS solutions, IMU calibration and post-processing functions.

- Data Source and Process Information

Data Sources

Data source information

Oneida County Ground Control Points

Title: Report of Survey - Ground Control

Originators: Sanborn

Publisher: Sanborn

Publication place: 1935 Jamboree Drive, Colorado Springs, CO 80920

Publication date: 20080718

Data type: document

Other citation details: Ground Control points in UTM Zone 18 North referenced to NAD83 and NAVD88 (Geiod03) in meters.
On record at Sanborn, 1935 Jamboree Drive, Suite 100, Colorado Springs, CO 80920

Media: Not Applicable

Source contribution: Ground Control: X,Y,Z
459133.151,4769045.349,218.742
464445.106,4752460.779,376.923
452914.288,4769551.896,165.632
452130.025,4767549.58,188.531
458199.748,4763981.579,253.89
458714.144,4754541.98,371.848
461532.65,4754161.554,327.562
456035.649,4769730.293,193.898
449748.963,4769514.902,144.413
457818.884,4757734.459,381.875
462243.392,4754061.286,298.69
475882.681,4774700.129,131.495
475654.892,4748942.646,464.32
480333.653,4755969.32,332.68
477724.073,4766701.171,186.013
469521.309,4769705.044,170.806
461245.37,4769043.657,212.862
446985.148,4777174.482,137.354
441010.711,4780576.686,114.791
443043.037,4787320.571,128.487
451636.488,4786085.881,122.372
464260.827,4782206.147,135.351
469380.093,4780641.582,165.187
472734.225,4778830.78,132.899
470511.849,4751038.98,383.255
479995.361,4749190.784,372.268
479196.405,4761458.242,245.876
474992.195,4769472.171,170.213
453804.306,4774092.631,170.3
441891.27,4778259.985,120.114
440884.897,4783686.38,114.373
447314.203,4788124.531,117.326
456190.216,4786053.433,126.347
465980.488,4786372.014,145.986
484449.39,4791826.874,243.087
479339.6,4787769.116,197.708
478467.621,4794957.413,277.604
456686.535,4789190.954,136.839
449042.613,4795245.528,185.157
440046.796,4798566.404,146.664

447652.832,4804380.148,297.463
454183.238,4804793.288,341.903
463265.463,4807759.035,413.632
470113.54,4812589.911,407.368
478435.603,4810770.572,376.869
482489.585,4801115.548,377.095
473533.702,4814411.363,343.384
464550.778,4790047.934,146.722
467725.316,4793684.28,170.573
470943.473,4796931.586,181.683
474982.311,4796258.923,266.351
478299.294,4791232.784,299.496
482096.828,4789424.806,268.547
484693.738,4795022.135,343.94
481855.445,4807201.539,364.649
452413.019,4792324.391,164.44
443423.592,4795754.59,167.997
442640.463,4802960.551,252.058
452143.665,4802687.312,319.717
457447.468,4807061.454,406.726
467061.207,4809925.199,469.662

Date: 20080504

Currentness reference: ground condition

LiDAR Acquisition Parameters

Title: Oneida County LiDAR Acquisition Parameters

Originators: Sanborn

Publisher: Sanborn

Publication place: 1935 Jamboree Drive, Suite 100, Colorado Springs, CO 80920

Publication date: 20080220 *Publication time:* Unknown

Other citation details: LiDAR Acquisition Plan for Oneida County, NY
On record at Sanborn, 1935 Jamboree Drive, Suite 100, Colorado Springs, CO 80920

Media: Not Applicable

Source contribution: The following values are nominal and were taken directly from the LiDAR flight planning software for the Optech system (ALTM-NAV PLanner v.2.0.52) and the Leica system (ALS50 spreadsheet). Several variables could have affected these figures including wind speed, air turbulence, pilot error and subtle changes in terrain.

Optech: The areas of interest were flown at an altitude of 1200 meters (3937 feet) above mean terrain.
Airspeed - 120 knots.
Laser Pulse Rate - 50,000 Hz,
Full Field of View - 40 degrees,
Scane Rate - 32 Hz,
Swath Width - 1019 meters.

Leica: The areas of interest were flown at an altitude of 1500 meters (4921 feet) above mean terrain.
Airspeed - 120 knots.
Laser Pulse Rate - 55,000 Hz,
Full Field of View - 40 degrees,
Scane Rate - 32 Hz,
Swath Width - 1092 meters.

Date: 20080220

Currentness reference: publication date

Process Steps

Process step information

Process Step 1

Process description: Data collection:
Using Sanborn's Leica ALS50 (SN# 49) Light Detection And Ranging (LiDAR) system, 12 flight lines of

standard density (1.4 meter ground sample distance) data were collected over areas in Oneida County, NY (approximately 20 square miles). Multiple returns were recorded for each laser pulse along with an intensity value for each return. The data acquisition occurred in missions between May 02, 2009. During the LiDAR campaign, the Sanborn field crew conducted a GPS field survey to establish final coordinates of the ground control stations for final processing of the base-remote GPS solutions.

Person: Jamie Young

Organization: Sanborn Map Company, Inc.

Position: LiDAR General Manager

Phone: 719.264.5602

Fax: 719.264.5637

Telecommunications Device or Teletypewriter (TDD/TTY) phone: N/A

Email: jyoung@sanborn.com

Hours of service: 8:00 AM - 5:00 PM MST

Address type: mailing and physical address

   Address: 1935 Jamboree Drive Suite 100

   City: Colorado Springs

   State or Province: Colorado

   Postal code: 80920

   County: United States

Process date: 2009

Process Step 2

Process description: Airborne GPS processing:
Airborne GPS data was differentially processed and integrated with the post processed IMU data to derive a smoothed best estimate of trajectory (SBET). The SBET was used to reduce the LiDAR slant range measurements to a raw georeferenced point.
Airborne GPS is differentially processed using the GrafNAV v7.50 software by Waypoint Consulting of Calgary, Alberta, Canada.

The georeferenced point cloud was generated in ALTM software by Leica Inc.

Person: Jamie Young

Organization: Sanborn Map Company, Inc.

Position: LiDAR General Manager

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Hours of service: 8:00 AM - 5:00 PM MST

Address type: mailing and physical address

   Address: 1935 Jamboree Drive Suite 100

   City: Colorado Springs

   State or Province: Colorado

   Postal code: 80920

   County: United States

Process date: 2009

Process software and version: Waypoint Consulting - GrafNav v7.50

Process Step 3

Process description: IMU data processing:
IMU data provides information concerning roll, pitch and yaw of collection platform during collection event. IMU information allows the pulse vector to be properly placed in 3D space allowing the distance from the aircraft reference point to be properly positioned on the elevation model surface. IMU data is processed using the POSPac v4.2 software by Applanix Corporation of Richmond Hill, Ontario, Canada.

Person: Jamie Young

Organization: Sanborn Map Company, Inc.

Position: LiDAR General Manager

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   County: United States

Process date: 2009

Process software and version: Applanix - POSPac v4.2

Process Step 4

Process description: LiDAR point classification
The classification and quality control (QC) of LiDAR data is carried out using TerraScan software v. 8.003 by Terrasolid Limited of Helinski, Finland. The bare earth extraction from the point cloud is the result of a morphological processing routine run in TerraScan. A set of user-defined distances and angles are used by the software to build a ground surface from established 'aerial low seed points'. The reclassifying of the data in areas of overlapping scans is done before the classification of the LAS ground points (DEM). This means the point cloud from which the ground points are extracted is more uniform in terms of point density.
The 'cut-overlap' process is performed with the aid of the aircraft trajectory (reduced to the sensor's trajectory) and the scan angle value within the LAS data. For this project, the value used for cutting the overlap was 25 degrees. This means that data from a single scan greater than 12.5 degrees off nadir was classified to class 12 overlap. Using the trajectory and embedded angle information, the software (TerraScan) is able to properly reclassify the overlap points so that the remaining point cloud is edge-matched. That is to say, there are no data voids within the point cloud with class 12 overlap points turned off.

Person: Jamie Young

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   Postal code: 80920

   County: United States

Process date: 2009

Process software and version: TerraSolid - TerraScan v.8.000

Process Step 5

Process description: Output LAS files
The tiling and final LAS file creation was performed using LiDAR CuePac v5.0 from GeoCue Corporation of Madison, Alabama, USA. By client specification, the LiDAR point cloud data were cut to square, 750 x 750 meter (~56 Ha, 140 acres) tiles. The naming convention used for the tiles is based on the truncated grid coordinate at the southwest corner point of origin of the tile.

Person: Jamie Young

Organization: Sanborn Map Company, Inc.

Position: LiDAR General Manager

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   State or Province: Colorado

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   County: United States

Process date: 2009

Process software and version: GeoCue - LiDAR CuePac v5.0

Process Step 6

Process description: Summary and algorithms for filtering data:
The classification algorithms used on the LiDAR point cloud involved several iterative steps including the removal of low points and other outlyers, the culling of overlap data, and finally the classification of the LiDAR DEM. This process begins with automated routines and ends with a 100% manual edit and QC check of the data. Once the data set classification accuracy was deemed sufficient and no quality issues were found, a final vertical accuracy assessment was performed on the LiDAR DEM.

Person: Jamie Young

Organization: Sanborn Map Company, Inc.

Position: LiDAR General Manager

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   County: United States

Process date: 2009

Process Step 7

Process description: Data Validation

The final LiDAR LAS 1.1 was created in UTM Zone 18 North, referenced to NAD83 and NAVD 88, in meters. The final LiDAR DEM was verified against FEMA checkpoints in order to perform a redundancy check against the GPS solutions. These accuracy checks also verified that the data meets the guidelines outlined in FEMA's Guidelines and Specifications for Flood Hazard Mapping Partners and Appendix 4B, Airborne Light Detection and Ranging Systems.

Process date: 2009

Process software and version: Not Applicable

- Data Distribution Information

General

Resource description: Downloadable Data

Distribution liability: New York State Department of Environmental Conservation (NYS DEC) provides these geographic data "as is." NYS DEC makes no guarantee or warranty concerning the accuracy of information contained in the geographic data. NYS DEC further makes no warranty, either expressed or implied, regarding the condition of the product or its fitness for any particular purpose. The burden for determining fitness for use lies entirely with the user. Although these data have been processed successfully on a computer system at NYSDEC, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes. This disclaimer applies both to individual use of the data and aggregate use with other data. It is strongly recommended that careful attention be paid to the contents of the metadata file associated with these data. NYS DEC shall not be held liable for improper or incorrect use od the data described and/or contained herein.

Distribution Point of Contact

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　City: Albany
　State or Province: NY
　Postal code: 12233-2750
　County: USA

Standard Order Process

Digital form:
　Size of the data: 0.002
　Transfer size: 0.002

Available Time Period

Date: 20091921

- Metadata Reference

Metadata Date

Last updated: 20090921
Language of metadata: en

Metadata Point of Contact

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　City: Colorado Springs
　State or Province: CO

Postal code: 80920

County: USA

Metadata Standards

Standard name: FGDC Content Standards for Digital Geospatial Metadata

Standard version: FGDC-STD-001-1998

Time convention: local time

Metadata profiles defining additonal information:

Profile: ESRI Metadata Profile

Online linkage: http://www.esri.com/metadata/esriprof80.html

FGDC Plus Metadata Stylesheet

Federal Geographic Data Committee