

Dane County WROC – 3DEP
Dane County
LiDAR 2017

Vertical Accuracy Report

February 2018

Project Information

Prepared By: Ayres Associates

Project Name: Wisconsin WROC - 3DEP Dane County LiDAR 2017

Sensor Info: Leica ALS70 SN 7161

Required Nominal Pulse Spacing: 0.7

Contractor Name: Ayres Associates

Units: US Survey Feet

Date of Acquisition: Start: 3/21/2017 Finish: 3/22/2017

Report Information

This report documents the absolute vertical accuracy of the LiDAR data collected for the Dane County, WI, QL2 LiDAR project. Independent ground control checkpoints were collected by land surveyors using Trimble GNSS equipment connected to WISCORS base stations. The checkpoints were collected in March 2017.

The checkpoints were collected under various land cover types that are predominant in the County. Each land cover type falls into either the Non-vegetated Vertical Accuracy (NVA) or the Vegetated Vertical Accuracy (VVA) group. For this project, 75 NVA points and 56 VVA points were collected throughout the County.

The following report shows the final statistics for the NVA checkpoints compared against the raw swath point cloud and the bare earth DEM, and the VVA statistics compared against the DEM. Statistics are reported for LAS and DEM by NVA and VVA categories and by land cover type.

Vertical Accuracy Specifications per USGS QL2 level:

LAS:

NVA equates to 10 cm RMSEz, or 19.6 cm (0.64 ft) at the 95% confidence level.

DEM:

NVA equates to 10 cm RMSEz, or 19.6 cm (0.64 ft) at the 95% confidence level.

VVA equates to 29.4 cm (0.96 ft) at the 95th percentile.

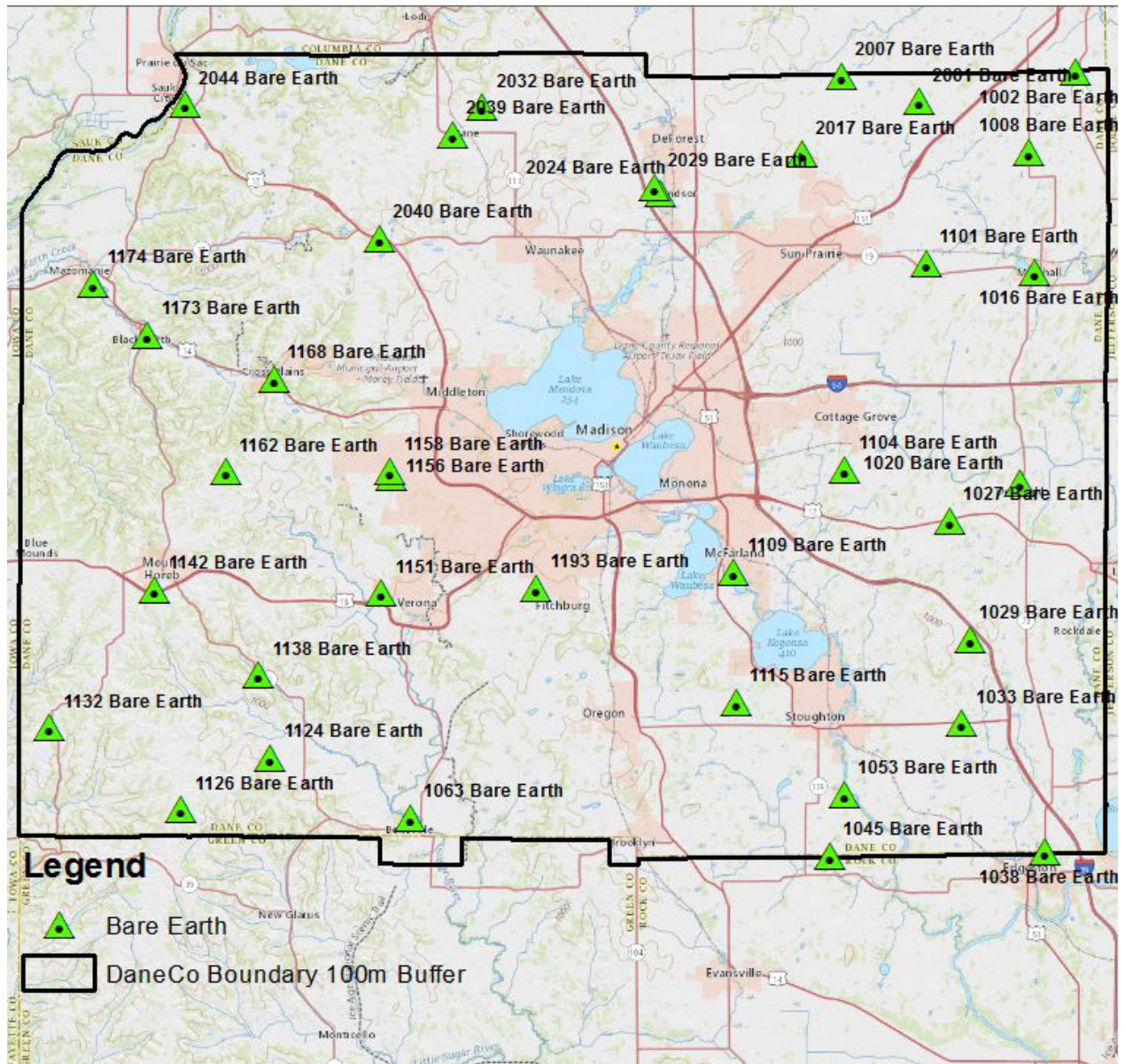
The NVA and VVA statistics for this project are within the above stated specifications.

LiDAR Accuracy Assessment Summary

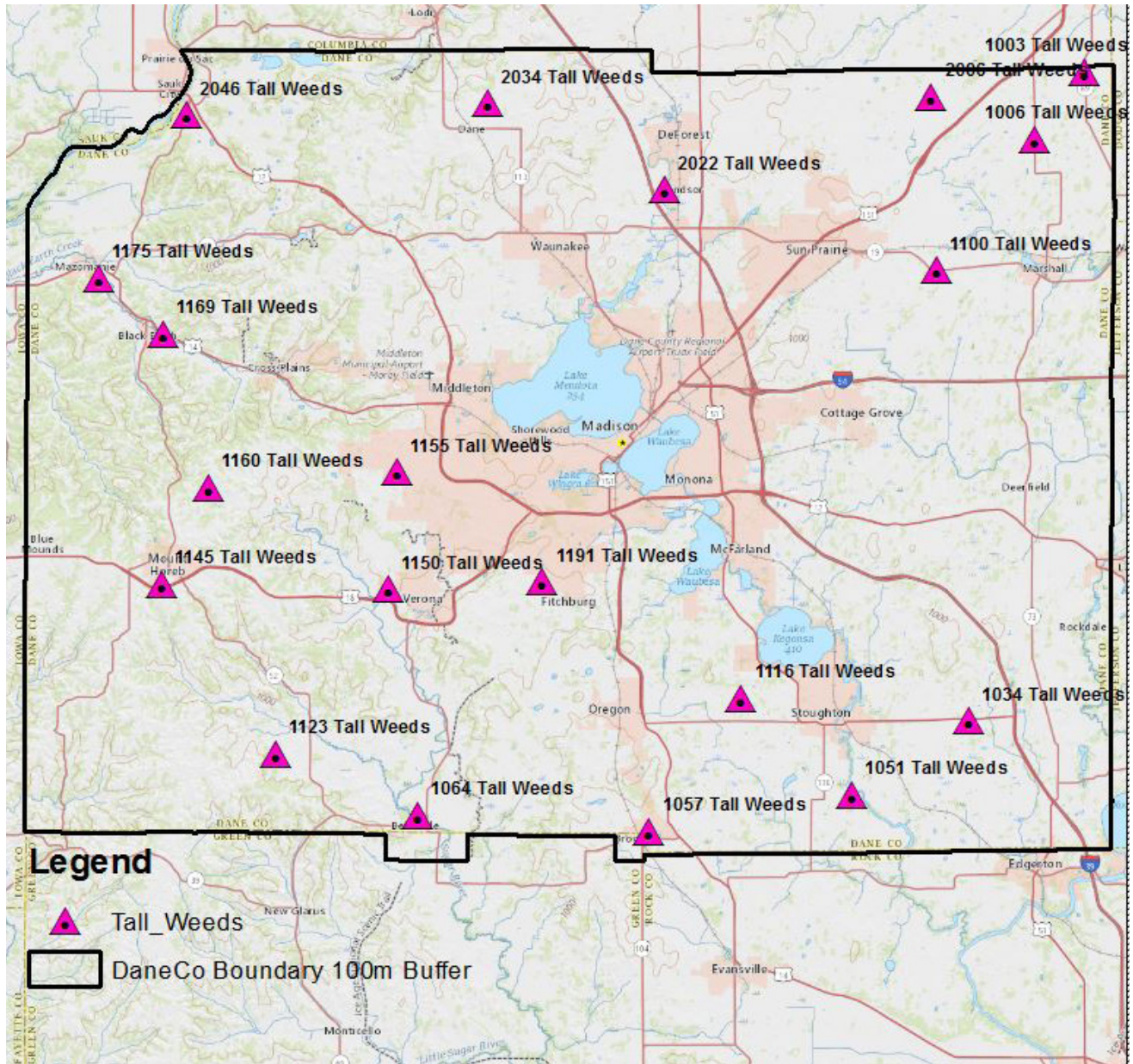
LAND COVER TYPE	# OF POINTS	NVA	VVA
LAS		95% confidence level	N/A
1. Bare Earth	37	0.432	N/A
2. Urban Areas	38	0.250	N/A
3. Tall Weeds	20	N/A	N/A
5. Forest	27	N/A	N/A
7. Swamp	9	N/A	N/A
TOTAL	131	0.352	N/A
DEM		95% confidence level	95th percentile
1. Bare Earth	37	0.401	N/A
2. Urban Areas	38	0.211	N/A
3. Tall Weeds	20	N/A	0.660
5. Forest	27	N/A	0.416
7. Swamp	9	N/A	0.620
TOTAL	131	0.319	0.620

Units: US Survey Feet

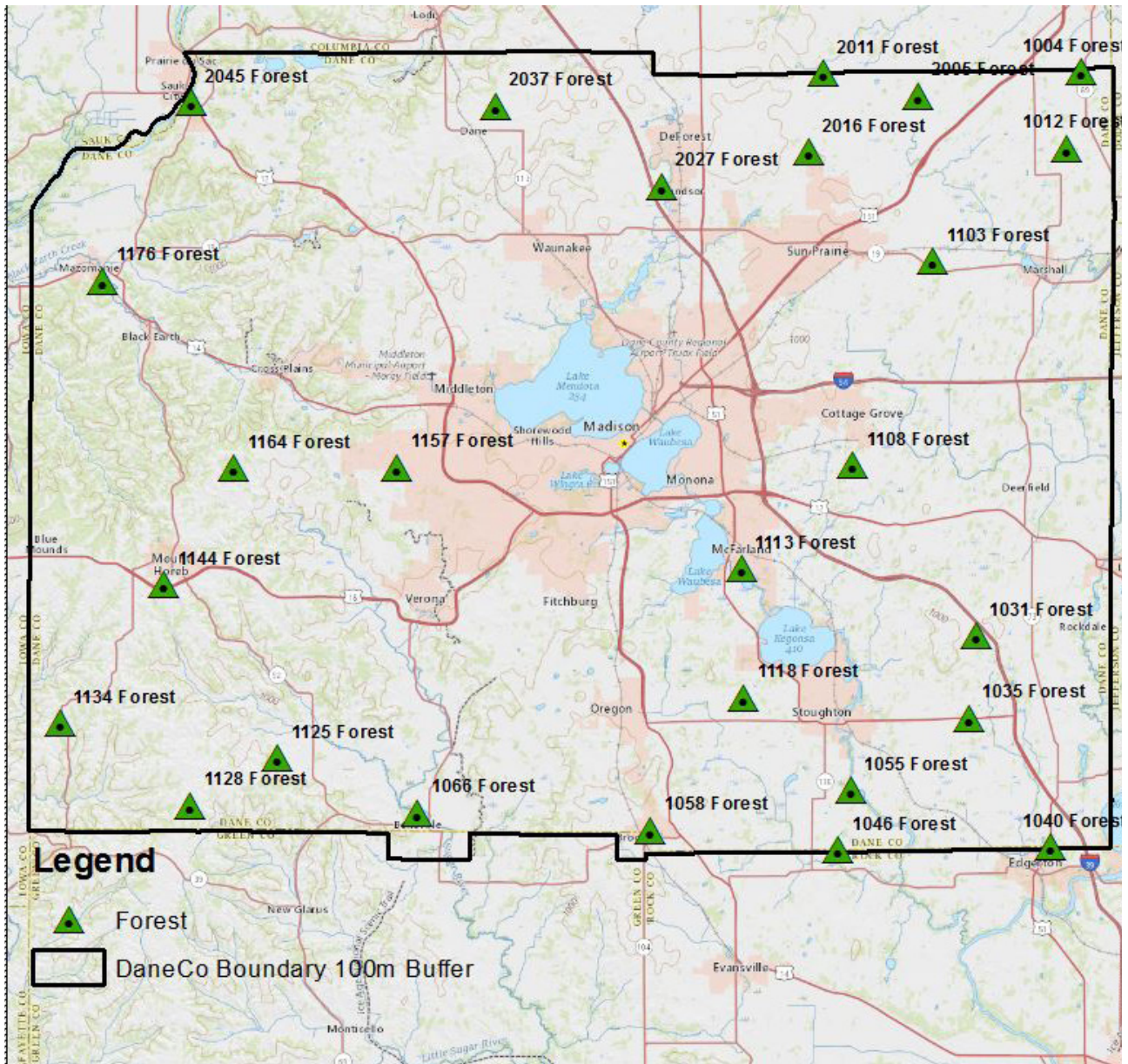
Map of NVA Checkpoint Locations - 1. Bare Earth



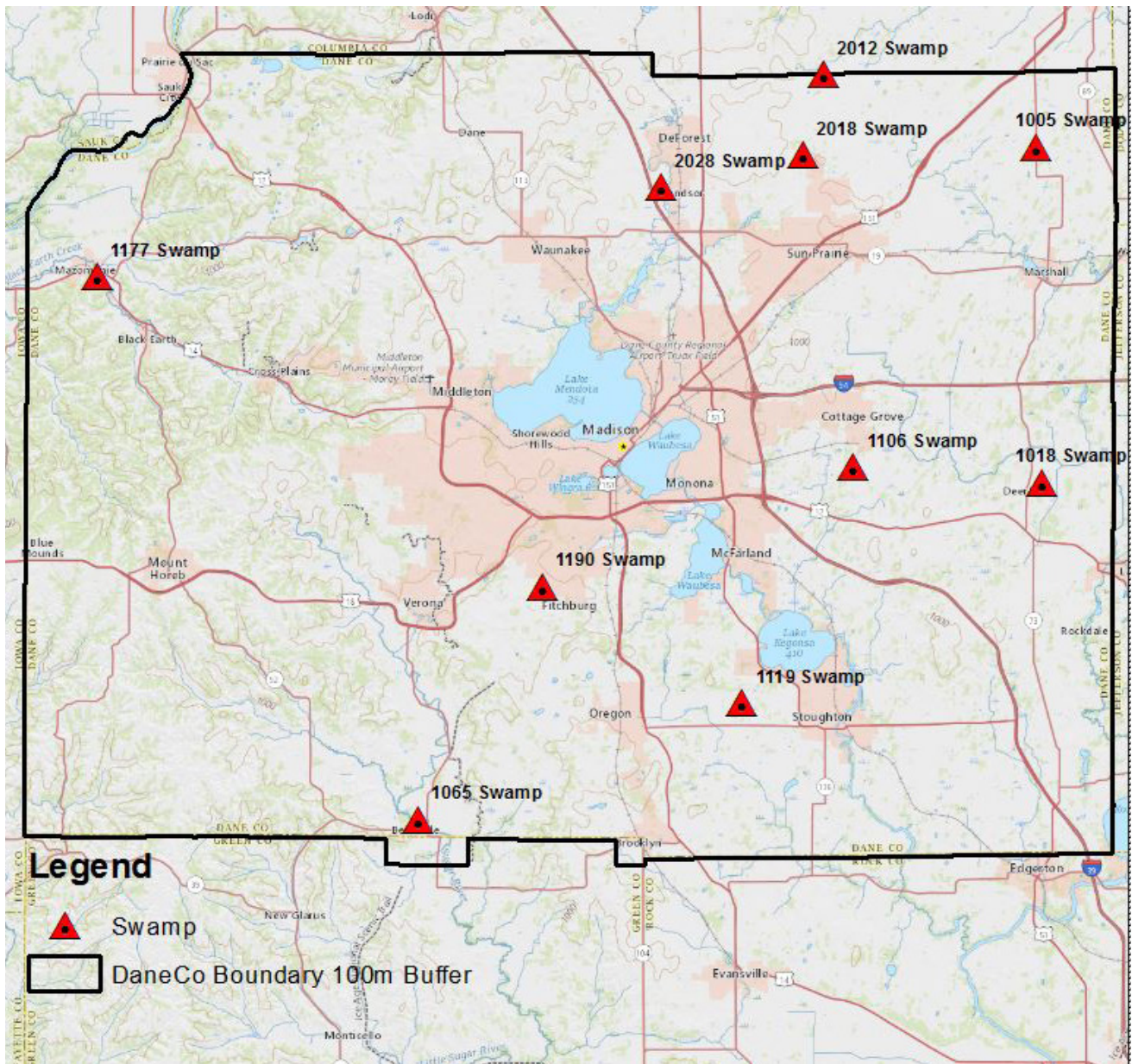
Map of VVA Checkpoint Locations - 3. Tall Weeds



Map of VVA Checkpoint Locations - 5. Forested Areas



Map of VVA Checkpoint Locations - 7. Swamp



LAS

NONVEGETATED VERTICAL ACCURACY—OVERALL	
Land Cover Type	1. Bare Earth, 2 Urban Areas
Minimum DZ	-0.358
Maximum DZ	0.407
Mean DZ	0.022
Mean Magnitude DZ	0.381
Number Observations	75
Standard Deviation DZ	0.179
RMSE Z	0.18
95% Confidence Level Z	0.352
Units	US Survey Feet

DEM

NONVEGETATED VERTICAL ACCURACY—OVERALL	
Land Cover Type	1. Bare Earth, 2. Urban Area
Minimum DZ	-0.264
Maximum DZ	0.393
Mean DZ	0.04
Mean Magnitude DZ	0.359
Number Observations	75
Standard Deviation DZ	0.159
RMSE Z	0.163
95% Confidence Level Z	0.319
Units	US Survey Feet

DEM (Continued)

VEGETATED VERTICAL ACCURACY	
Land Cover Type	3. Tall Weeds
Minimum DZ	-0.132
Maximum DZ	0.672
Mean DZ	0.294
Mean Magnitude DZ	0.558
Number Observations	20
Standard Deviation DZ	0.235
RMSE Z	0.373
95th Percentile	0.66
Units	US Survey Feet

DEM (Continued)

VEGETATED VERTICAL ACCURACY	
Land Cover Type	5. Forest
Minimum DZ	-0.183
Maximum DZ	0.421
Mean DZ	0.149
Mean Magnitude DZ	0.417
Number Observations	27
Standard Deviation DZ	0.149
RMSE Z	0.209
95th Percentile	0.416
Units	US Survey Feet

DEM (Continued)

VEGETATED VERTICAL ACCURACY	
Land Cover Type	7. Swamp
Minimum DZ	-0.331
Maximum DZ	0.62
Mean DZ	0.283
Mean Magnitude DZ	0.614
Number Observations	9
Standard Deviation DZ	0.329
RMSE Z	0.42
95th Percentile	0.62
Units	US Survey Feet

Point: 1002 Bare Earth

Survey X: 914987.21, Survey Y: 559287.26, Z1: 929.14, Z DEM: 929.25, Z LAS: 929.32, LC Type: 1, ΔZ DEM: 0.11, ΔZ LAS: 0.18



North



South



East



West

Point: 1003 Tall Weeds

Survey X: 915582.05, Survey Y: 558649.19, Z1: 903.8, Z DEM: 903.93, Z LAS: 904.05, LC Type: 3, AZ DEM: 0.13, AZ LAS: 0.25



North



South



East



West

Point: 1004 Forest

Survey X: 914938.45, Survey Y: 559109.49, Z1: 925.71, Z DEM: 925.95, Z LAS: 926.31, LC Type: 5, ΔZ DEM: 0.24, ΔZ LAS: 0.6



North



South



East



West



Point: 1005 Swamp

Survey X: 905366.8, Survey Y: 544038.68, Z1: 913.93, Z DEM: 914.32, Z LAS: 914.42, LC Type: 7, ΔZ DEM: 0.39, ΔZ LAS: 0.49



North



South



East



West



Point: 1006 Tall Weeds

Survey X: 905251.7, Survey Y: 544863.41, Z1: 915.85, Z DEM: 916.48, Z LAS: 916.43, LC Type: 3, ΔZ DEM: 0.63, ΔZ LAS: 0.58



North



South



East



West



Point: 1007 Urban Area

Survey X: 905250.65, Survey Y: 543092.33, Z1: 926.67, Z DEM: 926.71, Z LAS: 926.7, LC Type: 2, ΔZ DEM: 0.04, ΔZ LAS: 0.03



North



South



East



West



Point: 1008 Bare Earth

Survey X: 905288.21, Survey Y: 543096.53, Z1: 925.43, Z DEM: 925.49, Z LAS: 925.46, LC Type: 1, ΔZ DEM: 0.06, ΔZ LAS: 0.03



North



South



East



West



Point: 1012 Forest

Survey X: 911761.53, Survey Y: 543391.37, Z1: 901.58, Z DEM: 901.84, Z LAS: 901.92, LC Type: 5, ΔZ DEM: 0.26, ΔZ LAS: 0.34



North



South



East



West



Point: 1014 Urban Area

Survey X: 907452.53, Survey Y: 520498.77, Z1: 867.92, Z DEM: 867.88, Z LAS: 867.99, LC Type: 2, ΔZ DEM: -0.04, ΔZ LAS: 0.07



North



South



East



West



Point: 1015 Urban Area

Survey X: 906514.79, Survey Y: 518591.93, Z1: 853.11, Z DEM: 853.18, Z LAS: 853.16, LC Type: 2, ΔZ DEM: 0.07, ΔZ LAS: 0.05



North



South



East



West



Point: 1016 Bare Earth

Survey X: 906521.11, Survey Y: 518640.55, Z1: 852.83, Z DEM: 853.07, Z LAS: 853.04, LC Type: 1, ΔZ DEM: 0.24, ΔZ LAS: 0.21



North



South



East



West



Point: 1018 Swamp

Survey X: 906545.84, Survey Y: 475592.62, Z1: 850.75, Z DEM: 850.66, Z LAS: 850.88, LC Type: 7, ΔZ DEM: -0.09, ΔZ LAS: 0.13



North



South



East



West



Point: 1019 Urban Area

Survey X: 903558.27, Survey Y: 475525.74, Z1: 859.81, Z DEM: 859.71, Z LAS: 859.64, LC Type: 2, ΔZ DEM: -0.1, ΔZ LAS: -0.17



North



South



East



West

Point: 1020 Bare Earth

Survey X: 903530.87, Survey Y: 475425.34, Z1: 860.74, Z DEM: 860.74, Z LAS: 860.74, LC Type: 1, ΔZ DEM: 0, ΔZ LAS: 0



North



South



East



West



Point: 1021 Urban Area

Survey X: 903625.66, Survey Y: 474160.56, Z1: 868.04, Z DEM: 867.93, Z LAS: 867.87, LC Type: 2, ΔZ DEM: -0.11, ΔZ LAS: -0.17



North



South



East



West



Point: 1027 Bare Earth

Survey X: 889132.05, Survey Y: 467941.96, Z1: 987.57, Z DEM: 987.96, Z LAS: 987.88, LC Type: 1, ΔZ DEM: 0.39, ΔZ LAS: 0.31



North



South



East



West



Point: 1029 Bare Earth

Survey X: 893319.57, Survey Y: 443676.72, Z1: 964.04, Z DEM: 964.28, Z LAS: 964.4, LC Type: 1, ΔZ DEM: 0.24, ΔZ LAS: 0.36



North



South



East



West



Point: 1030 Urban Area

Survey X: 893087.81, Survey Y: 443694.1, Z1: 958.1, Z DEM: 957.88, Z LAS: 958.08, LC Type: 2, ΔZ DEM: -0.22, ΔZ LAS: -0.02



North



South



East



West



Point: 1031 Forest

Survey X: 893312.6, Survey Y: 443541.94, Z1: 963.04, Z DEM: 963.06, Z LAS: 963.14, LC Type: 5, ΔZ DEM: 0.02, ΔZ LAS: 0.1



North



South



East



West



Point: 1033 Bare Earth

Survey X: 891726.03, Survey Y: 426586.06, Z1: 875.07, Z DEM: 875.22, Z LAS: 875.24, LC Type: 1, ΔZ DEM: 0.15, ΔZ LAS: 0.17



North



South



East



West



Point: 1034 Tall Weeds

Survey X: 891774.53, Survey Y: 426318.2, Z1: 869.88, Z DEM: 869.75, Z LAS: 869.74, LC Type: 3, ΔZ DEM: -0.13, ΔZ LAS: -0.14



North



South



East



West

Point: 1035 Forest

Survey X: 891790.95, Survey Y: 426647.67, Z1: 871.99, Z DEM: 872.09, Z LAS: 872.21, LC Type: 5, ΔZ DEM: 0.1, ΔZ LAS: 0.22



North



South



East



West



Point: 1038 Bare Earth

Survey X: 908687, Survey Y: 400325.83, Z1: 832.99, Z DEM: 832.82, Z LAS: 832.79, LC Type: 1, ΔZ DEM: -0.17, ΔZ LAS: -0.2



North



South



East



West



Point: 1039 Urban Area

Survey X: 908737.82, Survey Y: 400127.19, Z1: 834.9, Z DEM: 834.78, Z LAS: 834.88, LC Type: 2, ΔZ DEM: -0.12, ΔZ LAS: -0.02



North



South



East



West



Point: 1040 Forest

Survey X: 908558.51, Survey Y: 400295.65, Z1: 834.96, Z DEM: 834.97, Z LAS: 835.04, LC Type: 5, ΔZ DEM: 0.01, ΔZ LAS: 0.08



North



South



East



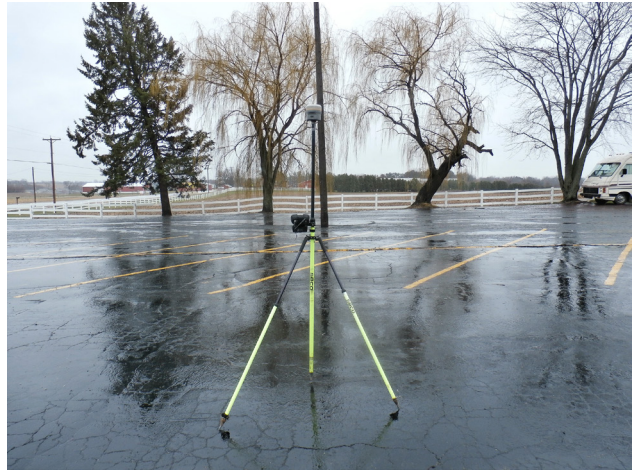
West

Point: 1043 Urban Area

Survey X: 908494.72, Survey Y: 402906.34, Z1: 865.23, Z DEM: 865.2, Z LAS: 865.23, LC Type: 2, ΔZ DEM: -0.03, ΔZ LAS: 0



North



South



East



West



Point: 1044 Urban Area

Survey X: 864934.67, Survey Y: 399632.61, Z1: 873.14, Z DEM: 873.13, Z LAS: 873.04, LC Type: 2, ΔZ DEM: -0.01, ΔZ LAS: -0.1



North



South



East



West



Point: 1045 Bare Earth

Survey X: 864675.09, Survey Y: 399540.89, Z1: 863.89, Z DEM: 864.11, Z LAS: 864.05, LC Type: 1, ΔZ DEM: 0.22, ΔZ LAS: 0.16



North



South



East



West



Point: 1046 Forest

Survey X: 865171.87, Survey Y: 399679.54, Z1: 878.06, Z DEM: 878.29, Z LAS: 878.2, LC Type: 5, ΔZ DEM: 0.23, ΔZ LAS: 0.14



North



South



East



West



Point: 1051 Tall Weeds

Survey X: 867904.49, Survey Y: 411163.95, Z1: 831.33, Z DEM: 831.52, Z LAS: 831.82, LC Type: 3, ΔZ DEM: 0.19, ΔZ LAS: 0.49



North



South



East



West



Point: 1053 Bare Earth

Survey X: 867736.59, Survey Y: 412067.55, Z1: 833.5, Z DEM: 833.29, Z LAS: 833.29, LC Type: 1, ΔZ DEM: -0.21, ΔZ LAS: -0.21



North



South



East



West



Point: 1054 Urban Area

Survey X: 867959.06, Survey Y: 411817.48, Z1: 832.14, Z DEM: 832, Z LAS: 831.86, LC Type: 2, ΔZ DEM: -0.14, ΔZ LAS: -0.28



North



South



East



West



Point: 1055 Forest

Survey X: 867706.97, Survey Y: 411915.46, Z1: 827.88, Z DEM: 828.3, Z LAS: 828.24, LC Type: 5, ΔZ DEM: 0.42, ΔZ LAS: 0.36



North



South



East



West



Point: 1057 Tall Weeds

Survey X: 826656.42, Survey Y: 403685.97, Z1: 991.58, Z DEM: 991.99, Z LAS: 991.84, LC Type: 3, ΔZ DEM: 0.41, ΔZ LAS: 0.26



North



South



East



West



Point: 1058 Forest

Survey X: 826657.39, Survey Y: 403735.43, Z1: 991.99, Z DEM: 992.08, Z LAS: 992.34, LC Type: 5, ΔZ DEM: 0.09, ΔZ LAS: 0.35



North



South



East



West



Point: 1063 Bare Earth

Survey X: 779014.37, Survey Y: 407292.22, Z1: 862.41, Z DEM: 862.37, Z LAS: 862.25, LC Type: 1, ΔZ DEM: -0.04, ΔZ LAS: -0.16



North



South



East

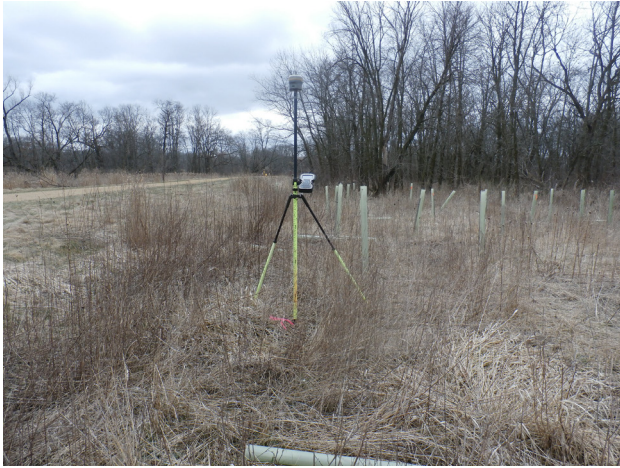


West



Point: 1064 Tall Weeds

Survey X: 779335.45, Survey Y: 407085.74, Z1: 860.77, Z DEM: 860.92, Z LAS: 860.92, LC Type: 3, ΔZ DEM: 0.15, ΔZ LAS: 0.15



North



South



East



West



Point: 1065 Swamp

Survey X: 779264.94, Survey Y: 407060.98, Z1: 858.98, Z DEM: 858.65, Z LAS: 859.02, LC Type: 7, ΔZ DEM: -0.33, ΔZ LAS: 0.04



North



South



East



West

Point: 1066 Forest

Survey X: 778901.49, Survey Y: 407314.62, Z1: 859.48, Z DEM: 859.59, Z LAS: 859.64, LC Type: 5, AZ DEM: 0.11, AZ LAS: 0.16



North



South



East



West

Point: 1067 Urban Area

Survey X: 781143.9, Survey Y: 409158.81, Z1: 874.05, Z DEM: 874.11, Z LAS: 874.07, LC Type: 2, ΔZ DEM: 0.06, ΔZ LAS: 0.02



North



South



East



West



Point: 1077 Urban Area

Survey X: 870600.9, Survey Y: 497127.24, Z1: 921.49, Z DEM: 921.41, Z LAS: 921.34, LC Type: 2, ΔZ DEM: -0.08, ΔZ LAS: -0.15



North



South



East



West



Point: 1079 Urban Area

Survey X: 879697.73, Survey Y: 495892.92, Z1: 879.31, Z DEM: 879.16, Z LAS: 879.27, LC Type: 2, ΔZ DEM: -0.15, ΔZ LAS: -0.04



North



South



East



West



Point: 1100 Tall Weeds

Survey X: 885327.11, Survey Y: 518198.12, Z1: 902.98, Z DEM: 903.44, Z LAS: 903.5, LC Type: 3, ΔZ DEM: 0.46, ΔZ LAS: 0.52



North



South



East



West

Point: 1101 Bare Earth

Survey X: 884316.06, Survey Y: 520350.03, Z1: 887.12, Z DEM: 886.98, Z LAS: 886.76, LC Type: 1, ΔZ DEM: -0.14, ΔZ LAS: -0.36



North



South



East



West



Point: 1102 Urban Area

Survey X: 884333.45, Survey Y: 519891.56, Z1: 889.63, Z DEM: 889.49, Z LAS: 889.4, LC Type: 2, ΔZ DEM: -0.14, ΔZ LAS: -0.23



North



South



East



West



Point: 1103 Forest

Survey X: 884379.67, Survey Y: 520250.54, Z1: 879.97, Z DEM: 880.18, Z LAS: 880.04, LC Type: 5, AZ DEM: 0.21, AZ LAS: 0.07



North



South



East



West



Point: 1104 Bare Earth

Survey X: 867851.27, Survey Y: 478404.82, Z1: 872.7, Z DEM: 872.76, Z LAS: 872.53, LC Type: 1, ΔZ DEM: 0.06, ΔZ LAS: -0.17



North



South



East



West



Point: 1106 Swamp

Survey X: 867974.52, Survey Y: 478744.69, Z1: 870.52, Z DEM: 870.57, Z LAS: 872.01, LC Type: 7, AZ DEM: 0.05, AZ LAS: 1.49



North



South



East



West



Point: 1107 Urban Area

Survey X: 867990.08, Survey Y: 478717.22, Z1: 874.16, Z DEM: 874.15, Z LAS: 874, LC Type: 2, ΔZ DEM: -0.01, ΔZ LAS: -0.16



North



South



East



West



Point: 1108 Forest

Survey X: 867953.19, Survey Y: 478420.27, Z1: 875.23, Z DEM: 875.17, Z LAS: 875.36, LC Type: 5, ΔZ DEM: -0.06, ΔZ LAS: 0.13



North



South



East



West



Point: 1109 Bare Earth

Survey X: 845125.26, Survey Y: 457378.95, Z1: 854.08, Z DEM: 854.38, Z LAS: 854.21, LC Type: 1, ΔZ DEM: 0.3, ΔZ LAS: 0.13



North



South



East



West



Point: 1110 Urban Area

Survey X: 844977.9, Survey Y: 457593.23, Z1: 856.99, Z DEM: 856.92, Z LAS: 856.97, LC Type: 2, ΔZ DEM: -0.07, ΔZ LAS: -0.02



North



South



East



West



Point: 1113 Forest

Survey X: 845304.55, Survey Y: 457326.59, Z1: 848.7, Z DEM: 849.12, Z LAS: 849.32, LC Type: 5, ΔZ DEM: 0.42, ΔZ LAS: 0.62



North



South



East



West

Point: 1115 BAre Earth

Survey X: 845523.65, Survey Y: 430942.61, Z1: 909.83, Z DEM: 910.05, Z LAS: 909.99, LC Type: 1, ΔZ DEM: 0.22, ΔZ LAS: 0.16



North



South



East



West



Point: 1116 Tall Weeds

Survey X: 845245.36, Survey Y: 430822.78, Z1: 904.85, Z DEM: 904.93, Z LAS: 905.01, LC Type: 3, ΔZ DEM: 0.08, ΔZ LAS: 0.16



North



South



East



West



Point: 1117 Urban Area

Survey X: 845363.04, Survey Y: 430907.26, Z1: 909.34, Z DEM: 909.12, Z LAS: 909.22, LC Type: 2, ΔZ DEM: -0.22, ΔZ LAS: -0.12



North



South



East



West



Point: 1118 Forest

Survey X: 845638.34, Survey Y: 430849.75, Z1: 909.47, Z DEM: 909.54, Z LAS: 909.91, LC Type: 5, AZ DEM: 0.07, AZ LAS: 0.44



North



South



East



West



Point: 1119 Swamp

Survey X: 845464.55, Survey Y: 430772.54, Z1: 900.09, Z DEM: 900.54, Z LAS: 900.78, LC Type: 7, ΔZ DEM: 0.45, ΔZ LAS: 0.69



North



South



East



West



Point: 1123 Tall Weeds

Survey X: 750434.56, Survey Y: 419548.89, Z1: 909.46, Z DEM: 909.77, Z LAS: 909.68, LC Type: 3, ΔZ DEM: 0.31, ΔZ LAS: 0.22



North



South



East



West



Point: 1124 Bare Earth

Survey X: 750500.44, Survey Y: 419586.2, Z1: 912.1, Z DEM: 912.35, Z LAS: 912.23, LC Type: 1, ΔZ DEM: 0.25, ΔZ LAS: 0.13



North



South



East



West



Point: 1125 Forest

Survey X: 750222.29, Survey Y: 418492.74, Z1: 907.28, Z DEM: 907.42, Z LAS: 907.62, LC Type: 5, ΔZ DEM: 0.14, ΔZ LAS: 0.34



North



South



East



West



Point: 1126 Bare Earth

Survey X: 732243.36, Survey Y: 408959.89, Z1: 1106.46, Z DEM: 1106.73, Z LAS: 1106.79, LC Type: 1, ΔZ DEM: 0.27, ΔZ LAS: 0.33



North



South



East



West



Point: 1127 Urban Area

Survey X: 732231.73, Survey Y: 409354.66, Z1: 1129.78, Z DEM: 1129.67, Z LAS: 1129.65, LC Type: 2, ΔZ DEM: -0.11, ΔZ LAS: -0.13



North



South



East



West



Point: 1128 Forest

Survey X: 732312.44, Survey Y: 408843.61, Z1: 1102.45, Z DEM: 1102.78, Z LAS: 1103.01, LC Type: 5, ΔZ DEM: 0.33, ΔZ LAS: 0.56



North



South



East



West



Point: 1132 Bare Earth

Survey X: 705525.41, Survey Y: 425621.28, Z1: 1105.99, Z DEM: 1106, Z LAS: 1105.95, LC Type: 1, ΔZ DEM: 0.01, ΔZ LAS: -0.04



North



South



East



West



Point: 1134 Forest

Survey X: 705568.33, Survey Y: 425708.01, Z1: 1101.34, Z DEM: 1101.47, Z LAS: 1101.37, LC Type: 5, ΔZ DEM: 0.13, ΔZ LAS: 0.03



North



South



East



West



Point: 1135 Urban Area

Survey X: 705287.73, Survey Y: 424418.5, Z1: 1147.91, Z DEM: 1148.01, Z LAS: 1147.93, LC Type: 2, ΔZ DEM: 0.1, ΔZ LAS: 0.02



North



South



East



West



Point: 1137 Urban Area

Survey X: 748177.91, Survey Y: 436404.47, Z1: 915.35, Z DEM: 915.44, Z LAS: 915.47, LC Type: 2, ΔZ DEM: 0.09, ΔZ LAS: 0.12



North



South



East



West



Point: 1138 Bare Earth

Survey X: 748119.22, Survey Y: 436373.99, Z1: 911.72, Z DEM: 911.99, Z LAS: 911.99, LC Type: 1, ΔZ DEM: 0.27, ΔZ LAS: 0.27



North



South



East



West



Point: 1142 Bare Earth

Survey X: 726889.08, Survey Y: 453902.27, Z1: 1136.51, Z DEM: 1136.42, Z LAS: 1136.54, LC Type: 1, ΔZ DEM: -0.09, ΔZ LAS: 0.03



North



South



East



West



Point: 1143 Urban Area

Survey X: 726865.62, Survey Y: 453735.34, Z1: 1137.92, Z DEM: 1137.91, Z LAS: 1137.83, LC Type: 2, ΔZ DEM: -0.01, ΔZ LAS: -0.09



North



South



East



West



Point: 1144 Forest

Survey X: 726851.1, Survey Y: 454004.52, Z1: 1141.44, Z DEM: 1141.26, Z LAS: 1141.58, LC Type: 5, ΔZ DEM: -0.18, ΔZ LAS: 0.14



North



South



East



West



Point: 1145 Tall Weeds

Survey X: 727272.79, Survey Y: 454197.42, Z1: 1144.98, Z DEM: 1145.3, Z LAS: 1145.33, LC Type: 3, ΔZ DEM: 0.32, ΔZ LAS: 0.35



North



South



East



West

Point: 1149 Urban Area

Survey X: 773329.49, Survey Y: 453122.47, Z1: 978.85, Z DEM: 978.77, Z LAS: 978.75, LC Type: 2, ΔZ DEM: -0.08, ΔZ LAS: -0.1



North



South



East



West



Point: 1150 Tall Weeds

Survey X: 773351.82, Survey Y: 453118.69, Z1: 980.55, Z DEM: 980.73, Z LAS: 980.53, LC Type: 3, ΔZ DEM: 0.18, ΔZ LAS: -0.02



North



South



East



West



Point: 1151 Bare Earth

Survey X: 773268.33, Survey Y: 453060.31, Z1: 980.13, Z DEM: 980.26, Z LAS: 980.24, LC Type: 1, ΔZ DEM: 0.13, ΔZ LAS: 0.11



North



South



East



West



Point: 1154 Urban Area

Survey X: 775380.7, Survey Y: 476873.38, Z1: 1096.12, Z DEM: 1095.93, Z LAS: 1095.89, LC Type: 2, ΔZ DEM: -0.19, ΔZ LAS: -0.23



North



South



East



West



Point: 1155 Tall Weeds

Survey X: 775301.91, Survey Y: 476927.15, Z1: 1098.44, Z DEM: 1098.74, Z LAS: 1098.78, LC Type: 3, ΔZ DEM: 0.3, ΔZ LAS: 0.34



North



South



East



West

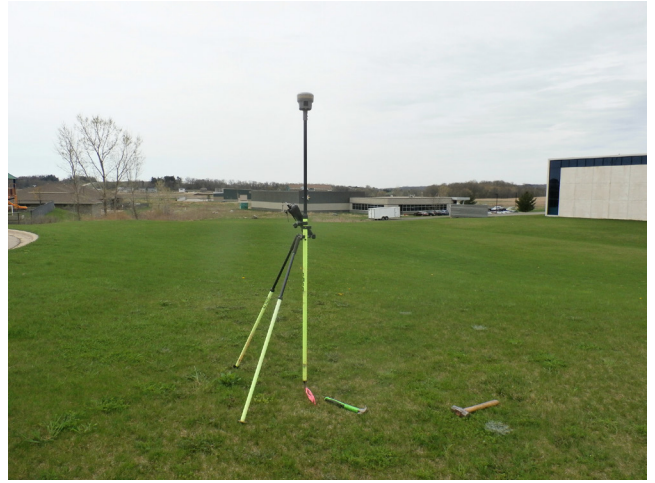


Point: 1156 Bare Earth

Survey X: 775338.11, Survey Y: 476791.05, Z1: 1096.81, Z DEM: 1097.04, Z LAS: 1097.03, LC Type: 1, ΔZ DEM: 0.23, ΔZ LAS: 0.22



North



South



East



West



Point: 1157 Forest

Survey X: 774738.65, Survey Y: 478001.64, Z1: 1122.84, Z DEM: 1123.19, Z LAS: 1123.31, LC Type: 5, ΔZ DEM: 0.35, ΔZ LAS: 0.47



North



South



East



West



Point: 1158 Bare Earth

Survey X: 774953.63, Survey Y: 478035.48, Z1: 1129.82, Z DEM: 1130.04, Z LAS: 1130.08, LC Type: 1, ΔZ DEM: 0.22, ΔZ LAS: 0.26



North



South



East



West



Point: 1159 Urban Area

Survey X: 775058.07, Survey Y: 477997.75, Z1: 1127.51, Z DEM: 1127.49, Z LAS: 1127.49, LC Type: 2, ΔZ DEM: -0.02, ΔZ LAS: -0.02



North



South



East



West



Point: 1160 Tall Weeds

Survey X: 736652.48, Survey Y: 473909.47, Z1: 1109.74, Z DEM: 1109.7, Z LAS: 1109.7, LC Type: 3, ΔZ DEM: -0.04, ΔZ LAS: -0.04



North



South



East



West



Point: 1162 Bare Earth

Survey X: 741386.36, Survey Y: 477905.24, Z1: 1148.9, Z DEM: 1148.96, Z LAS: 1148.89, LC Type: 1, ΔZ DEM: 0.06, ΔZ LAS: -0.01



North



South



East



West



Point: 1164 Forest

Survey X: 741348.88, Survey Y: 477872.15, Z1: 1147.23, Z DEM: 1147.55, Z LAS: 1147.72, LC Type: 5, ΔZ DEM: 0.32, ΔZ LAS: 0.49



North



South



East



West



Point: 1167 Urban Area

Survey X: 751293.43, Survey Y: 496792.32, Z1: 880.85, Z DEM: 880.91, Z LAS: 880.83, LC Type: 2, ΔZ DEM: 0.06, ΔZ LAS: -0.02



North



South



East



West



Point: 1168 Bare Earth

Survey X: 751256.48, Survey Y: 496784.62, Z1: 880.75, Z DEM: 881.05, Z LAS: 881.16, LC Type: 1, ΔZ DEM: 0.3, ΔZ LAS: 0.41



North



South



East



West



Point: 1169 Tall Weeds

Survey X: 727567.6, Survey Y: 505119.25, Z1: 825.52, Z DEM: 826.1, Z LAS: 825.86, LC Type: 3, ΔZ DEM: 0.58, ΔZ LAS: 0.34



North



South



East



West



Point: 1172 Urban Area

Survey X: 725408.84, Survey Y: 505766.15, Z1: 815.55, Z DEM: 815.69, Z LAS: 815.64, LC Type: 2, ΔZ DEM: 0.14, ΔZ LAS: 0.09



North



South



East



West



Point: 1173 Bare Earth

Survey X: 725362.04, Survey Y: 505833.79, Z1: 814.85, Z DEM: 814.85, Z LAS: 814.88, LC Type: 1, ΔZ DEM: 0, ΔZ LAS: 0.03



North



South



East



West



Point: 1174 Bare Earth

Survey X: 714313.21, Survey Y: 516256.81, Z1: 785.59, Z DEM: 785.33, Z LAS: 785.32, LC Type: 1, ΔZ DEM: -0.26, ΔZ LAS: -0.27



North



South



East



West



Point: 1175 Tall Weeds

Survey X: 714398.25, Survey Y: 516454.95, Z1: 777.19, Z DEM: 777.2, Z LAS: 777.39, LC Type: 3, ΔZ DEM: 0.01, ΔZ LAS: 0.2



North



South



East



West



Point: 1176 Forest

Survey X: 714482.94, Survey Y: 516175.19, Z1: 780.55, Z DEM: 780.47, Z LAS: 780.54, LC Type: 5, ΔZ DEM: -0.08, ΔZ LAS: -0.01



North



South



East



West



Point: 1177 Swamp

Survey X: 713936.85, Survey Y: 517492.8, Z1: 775.54, Z DEM: 775.69, Z LAS: 775.71, LC Type: 5, ΔZ DEM: 0.15, ΔZ LAS: 0.17



North



South



East



West



Point: 1179 Urban Area

Survey X: 711693.97, Survey Y: 519898.6, Z1: 777.39, Z DEM: 777.57, Z LAS: 777.54, LC Type: 2, ΔZ DEM: 0.18, ΔZ LAS: 0.15



North



South



East



West



Point: 1187 Urban Area

Survey X: 812264.81, Survey Y: 440794.25, Z1: 977.91, Z DEM: 977.78, Z LAS: 977.67, LC Type: 2, ΔZ DEM: -0.13, ΔZ LAS: -0.24



North



South



East



West



Point: 1190 Swamp

Survey X: 804653.44, Survey Y: 454537.47, Z1: 1023.38, Z DEM: 1023.75, Z LAS: 1023.95, LC Type: 7, ΔZ DEM: 0.37, ΔZ LAS: 0.57



North



South



East



West

Point: 1191 Tall Weeds

Survey X: 804868.78, Survey Y: 454561.07, Z1: 1025.2, Z DEM: 1025.34, Z LAS: 1025.43, LC Type: 3, ΔZ DEM: 0.14, ΔZ LAS: 0.23



North



South



East



West



Point: 1192 Urban Area

Survey X: 804578.08, Survey Y: 454274.63, Z1: 1029.71, Z DEM: 1029.7, Z LAS: 1029.57, LC Type: 2, ΔZ DEM: -0.01, ΔZ LAS: -0.14



North



South



East



West



Point: 1193 Bare Earth

Survey X: 804711.69, Survey Y: 454201.64, Z1: 1029.86, Z DEM: 1029.82, Z LAS: 1029.72, LC Type: 1, ΔZ DEM: -0.04, ΔZ LAS: -0.14



North



South



East



West



Point: 2001 Bare Earth

Survey X: 882884.75, Survey Y: 553347.35, Z1: 948.59, Z DEM: 948.6, Z LAS: 948.7, LC Type: 1, ΔZ DEM: 0.01, ΔZ LAS: 0.11



North



South



East



West



Point: 2002 Urban Area

Survey X: 882422.49, Survey Y: 553142.94, Z1: 949.93, Z DEM: 949.98, Z LAS: 949.96, LC Type: 2, ΔZ DEM: 0.05, ΔZ LAS: 0.03



North



South



East



West



Point: 2003 Urban Area

Survey X: 881314.55, Survey Y: 554028.43, Z1: 938.65, Z DEM: 938.68, Z LAS: 938.48, LC Type: 2, ΔZ DEM: 0.03, ΔZ LAS: -0.17



North



South



East



West



Point: 2005 Forest

Survey X: 881411.57, Survey Y: 554077.97, Z1: 937.11, Z DEM: 937.27, Z LAS: 937.29, LC Type: 5, ΔZ DEM: 0.16, ΔZ LAS: 0.18



North



South



East



West

Point: 2006 Tall Weeds

Survey X: 884250.98, Survey Y: 553453.45, Z1: 912.63, Z DEM: 913.29, Z LAS: 913.35, LC Type: 3, ΔZ DEM: 0.66, ΔZ LAS: 0.72



North



South



East



West

Point: 2007 Bare Earth

Survey X: 867229.12, Survey Y: 558650.73, Z1: 973.31, Z DEM: 973.62, Z LAS: 973.71, LC Type: 1, ΔZ DEM: 0.31, ΔZ LAS: 0.4



North



South



East



West



Point: 2010 Urban Area

Survey X: 861788.98, Survey Y: 558570.11, Z1: 934.45, Z DEM: 934.35, Z LAS: 934.3, LC Type: 2, ΔZ DEM: -0.1, ΔZ LAS: -0.15



North



South



East



West



Point: 2011 Forest

Survey X: 861904.88, Survey Y: 558668.71, Z1: 931.52, Z DEM: 931.58, Z LAS: 931.52, LC Type: 5, ΔZ DEM: 0.06, ΔZ LAS: 0



North



South



East



West



Point: 2012 Swamp

Survey X: 862015.38, Survey Y: 558753, Z1: 930.43, Z DEM: 931.01, Z LAS: 930.97, LC Type: 7, ΔZ DEM: 0.58, ΔZ LAS: 0.54



North



South



East



West



Point: 2016 Forest

Survey X: 859146, Survey Y: 542559.25, Z1: 967.34, Z DEM: 967.51, Z LAS: 967.54, LC Type: 5, ΔZ DEM: 0.17, ΔZ LAS: 0.2



North



South



East



West



Point: 2017 Bare Earth

Survey X: 859176.73, Survey Y: 542671.09, Z1: 967.4, Z DEM: 967.7, Z LAS: 967.8, LC Type: 1, ΔZ DEM: 0.3, ΔZ LAS: 0.4



North



South



East



West



Point: 2018 Swamp

Survey X: 857895.94, Survey Y: 542381.74, Z1: 928.69, Z DEM: 929.19, Z LAS: 929.6, LC Type: 7, ΔZ DEM: 0.5, ΔZ LAS: 0.91



North



South



East



West



Point: 2020 Urban Area

Survey X: 858306.6, Survey Y: 545309.54, Z1: 981.8, Z DEM: 981.92, Z LAS: 981.95, LC Type: 2, AZ DEM: 0.12, AZ LAS: 0.15



North



South



East



West



Point: 2021 Urban Area

Survey X: 829733.05, Survey Y: 534574.79, Z1: 880.87, Z DEM: 880.8, Z LAS: 880.83, LC Type: 2, ΔZ DEM: -0.07, ΔZ LAS: -0.04



North



South



East



West



Point: 2022 Tall Weeds

Survey X: 829763.9, Survey Y: 534633.84, Z1: 880.96, Z DEM: 881.37, Z LAS: 881.45, LC Type: 3, ΔZ DEM: 0.41, ΔZ LAS: 0.49



North



South



East



West



Point: 2024 Bare Earth

Survey X: 830150.18, Survey Y: 534557.64, Z1: 875.29, Z DEM: 875.56, Z LAS: 875.54, LC Type: 1, ΔZ DEM: 0.27, ΔZ LAS: 0.25



North



South



East



West



Point: 2027 Forest

Survey X: 828853.1, Survey Y: 535627.63, Z1: 906.03, Z DEM: 906.02, Z LAS: 906.02, LC Type: 5, ΔZ DEM: -0.01, ΔZ LAS: -0.01



North



South



East



West

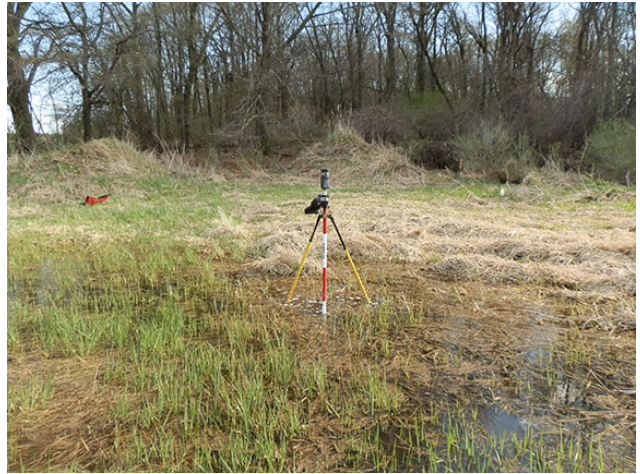


Point: 2028 Swamp

Survey X: 828847.48, Survey Y: 535793.63, Z1: 892.27, Z DEM: 892.89, Z LAS: 893.01, LC Type: 7, ΔZ DEM: 0.62, ΔZ LAS: 0.74



North



South



East



West



Point: 2029 Bare Earth

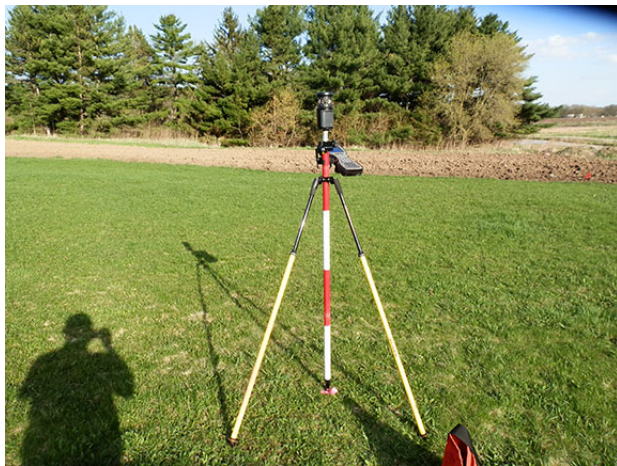
Survey X: 829027.85, Survey Y: 535964.16, Z1: 897.52, Z DEM: 897.51, Z LAS: 897.47, LC Type: 1, ΔZ DEM: -0.01, ΔZ LAS: -0.05



North



South



East



West



Point: 2031 Urban Area

Survey X: 794052.44, Survey Y: 552237.37, Z1: 1051.8, Z DEM: 1051.79, Z LAS: 1051.72, LC Type: 2, ΔZ DEM: -0.01, ΔZ LAS: -0.08



North



South



East



West



Point: 2032 Bare Earth

Survey X: 793877.08, Survey Y: 552195.61, Z1: 1043.49, Z DEM: 1043.49, Z LAS: 1043.57, LC Type: 1, ΔZ DEM: 0, ΔZ LAS: 0.08



North



South



East



West



Point: 2034 Tall Weeds

Survey X: 793683.82, Survey Y: 552190.05, Z1: 1040.44, Z DEM: 1040.86, Z LAS: 1040.86, LC Type: 3, ΔZ DEM: 0.42, ΔZ LAS: 0.42



North



South



East



West



Point: 2037 Forest

Survey X: 794866.87, Survey Y: 552083.23, Z1: 1083.38, Z DEM: 1083.53, Z LAS: 1083.59, LC Type: 5, ΔZ DEM: 0.15, ΔZ LAS: 0.21



North



South



East



West



Point: 2038 Urban Area

Survey X: 787760.09, Survey Y: 546595.93, Z1: 1127.15, Z DEM: 1127.04, Z LAS: 1127.05, LC Type: 2, ΔZ DEM: -0.11, ΔZ LAS: -0.1



North



South



East



West



Point: 2039 Bare Earth

Survey X: 787686.73, Survey Y: 546646.88, Z1: 1129.52, Z DEM: 1129.84, Z LAS: 1129.76, LC Type: 1, ΔZ DEM: 0.32, ΔZ LAS: 0.24



North



South



East



West



Point: 2040 Bare Earth

Survey X: 772880.04, Survey Y: 525529.24, Z1: 965.47, Z DEM: 965.44, Z LAS: 965.55, LC Type: 1, ΔZ DEM: -0.03, ΔZ LAS: 0.08



North



South



East



West

Point: 2041 Urban Area

Survey X: 773088.74, Survey Y: 525883.23, Z1: 968.9, Z DEM: 968.89, Z LAS: 968.89, LC Type: 2, ΔZ DEM: -0.01, ΔZ LAS: -0.01



North



South



East



West



Point: 2043 Urban Area

Survey X: 732884.66, Survey Y: 552758.71, Z1: 768.91, Z DEM: 769.08, Z LAS: 769.12, LC Type: 2, ΔZ DEM: 0.17, ΔZ LAS: 0.21



North



South



East



West



Point: 2044 Bare Earth

Survey X: 733020.74, Survey Y: 552845.46, Z1: 771.89, Z DEM: 772.21, Z LAS: 772.16, LC Type: 1, ΔZ DEM: 0.32, ΔZ LAS: 0.27



North



South



East



West



Point: 2045 Forest

Survey X: 732627.79, Survey Y: 552756.1, Z1: 739.78, Z DEM: 740.02, Z LAS: 739.94, LC Type: 5, ΔZ DEM: 0.24, ΔZ LAS: 0.16



North



South



East



West



Point: 2046 Tall Weeds

Survey X: 732231.4, Survey Y: 549785.23, Z1: 746.26, Z DEM: 746.93, Z LAS: 746.68, LC Type: 3, ΔZ DEM: 0.67, ΔZ LAS: 0.42



North



South



East



West

