



Vertical Accuracy Report

Wisconsin WROC - 3DEP 2020

Vernon County Lidar

Ingenuity, Integrity, and Intelligence.

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Vertical Accuracy Report

Project Information

Prepared By: Ayres

Project Name: Wisconsin WROC – 3DEP Vernon County Lidar 2020

Sensor Info: Riegl VQ1560i SN4040

Required Nominal Pulse Spacing: 0.7 meters

Consultant Name: Ayres primary and Quantum Spatial (now NV5 Geospatial) as lidar acquisition partner

Units: U.S. Survey Feet

Date of Acquisition: Start: 4/18/2020 | Finish: 4/21/2020

Report Information

This report documents the absolute vertical accuracy of the lidar data collected for the Vernon County, WI, QL2 lidar project. Independent vertical checkpoints were collected by land surveyors using Trimble GNSS equipment connected to WISCORS base stations. The checkpoints were collected from June 18 to June 30, 2020.

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, 56 NVA points and 44 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.

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.

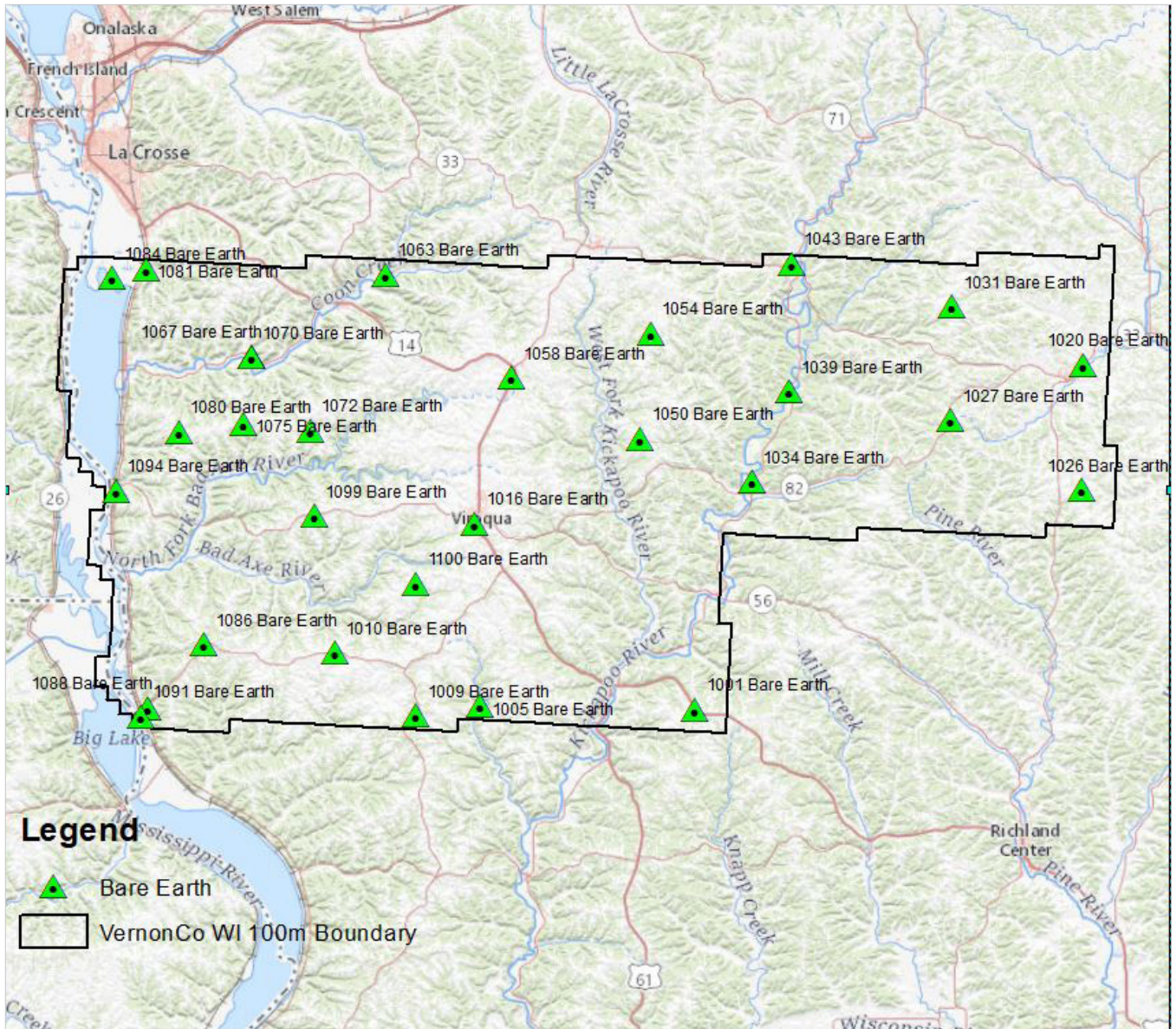
The NVA and VVA statistics for this project are within the above stated specifications.

Lidar Accuracy Assessment Summary

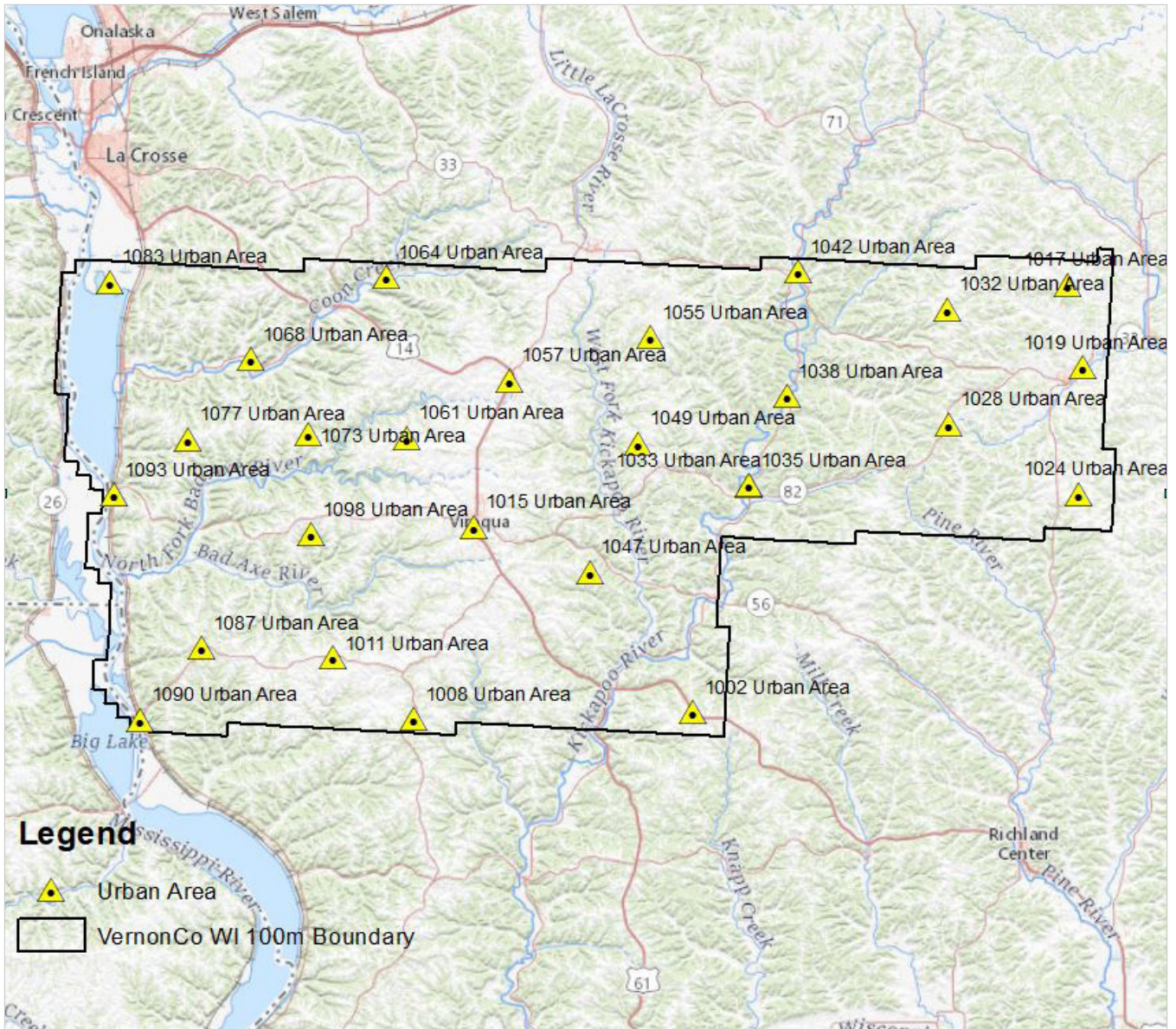
LAND COVER TYPE	# OF POINTS	NVA	VVA
LAS		95% confidence	
Bare Earth	29	0.251	N/A
Urban Area	27	0.146	N/A
Forest	20	N/A	N/A
Tall Weeds	24	N/A	N/A
Total	100	0.207	N/A
DEM		95% confidence	95th percentile
Bare Earth	29	0.260	N/A
Urban Area	27	0.115	N/A
Forest	20	N/A	0.437
Tall Weeds	24	N/A	0.446
Total	100	0.204	0.446

Units: U.S. Survey Feet

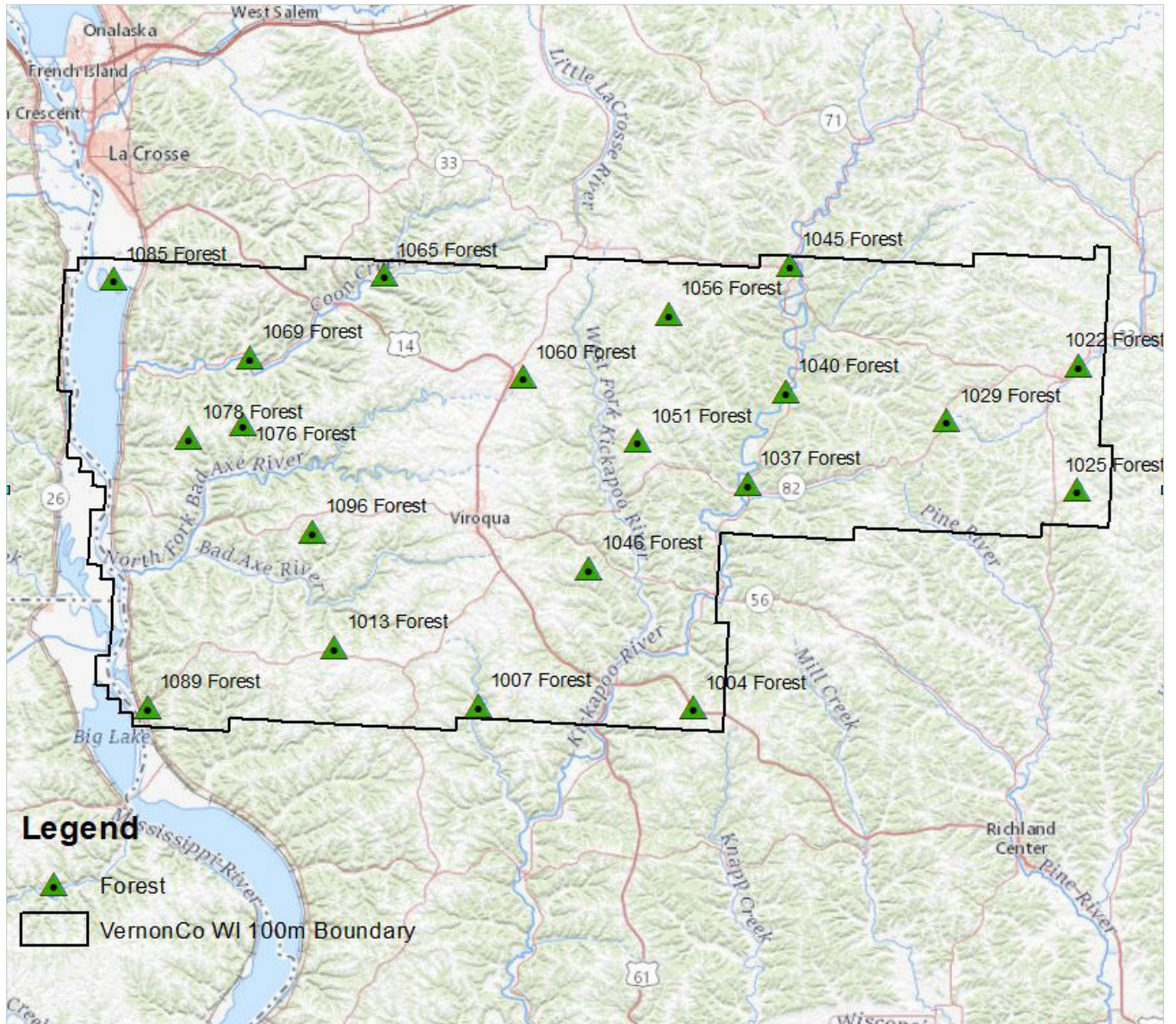
Map of NVA Checkpoint Locations - Bare Earth



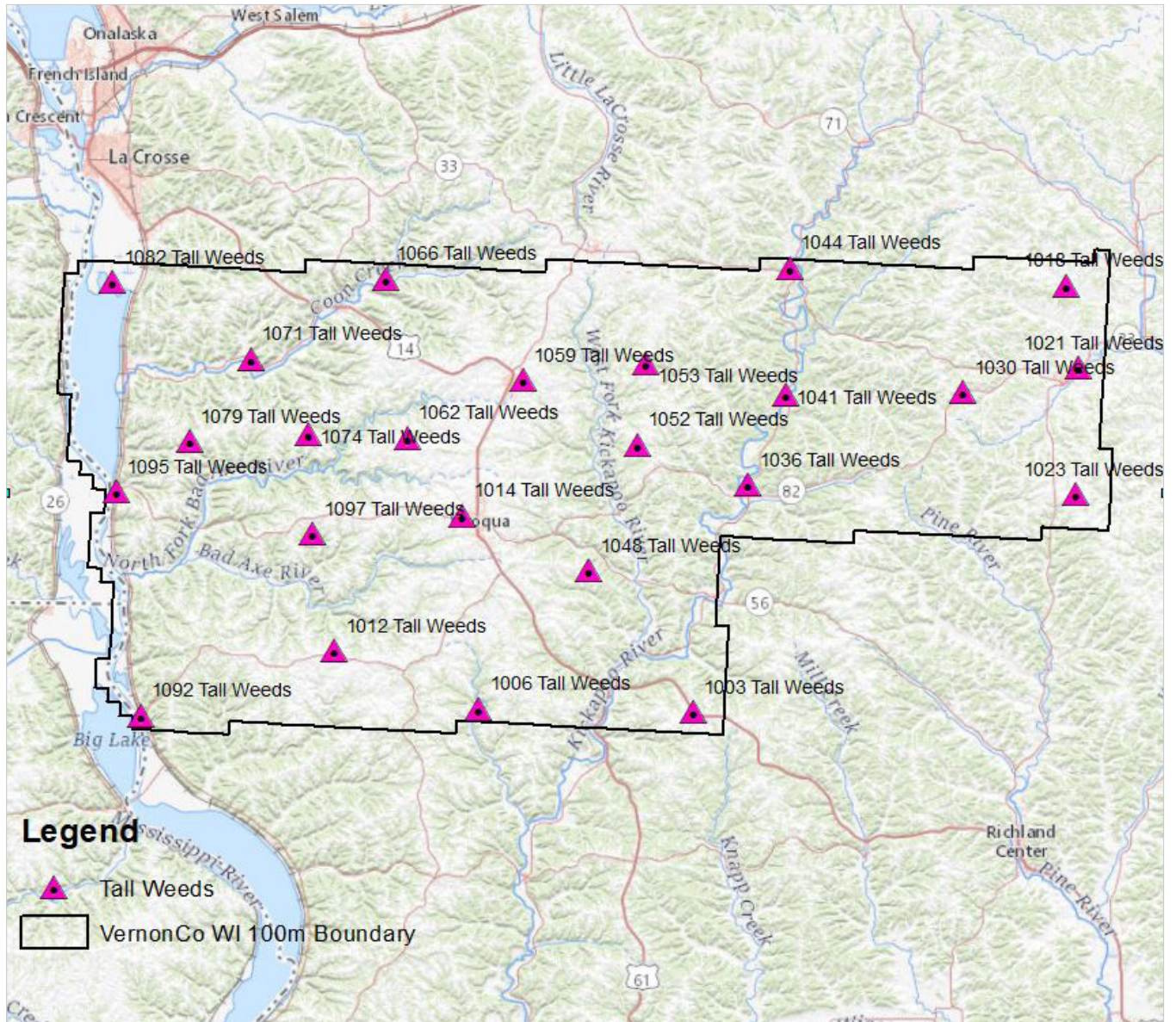
Map of NVA Checkpoint Locations - Urban Areas



Map of NVA Checkpoint Locations - Forested Areas



Map of NVA Checkpoint Locations - Tall Weeds



LAS

NONVEGETATED VERTICAL ACCURACY – OVERALL	
LAND COVER TYPE	BARE EARTH, URBAN AREA
Minimum DZ	-0.302
Maximum DZ	0.247
Mean DZ	0.008
Mean Magnitude DZ	0.278
Number Observations	56
Standard Deviation DZ	0.106
RMSE Z	0.106
95% Confidence Level Z	0.207
Units	U.S. Survey Feet

DEM

NONVEGETATED VERTICAL ACCURACY	
LAND COVER TYPE	BARE EARTH, URBAN AREA
Minimum DZ	-0.246
Maximum DZ	0.312
Mean DZ	0.039
Mean Magnitude DZ	0.276
Number Observations	56
Standard Deviation DZ	0.097
RMSE Z	0.104
95% Confidence Level Z	0.204
Units	U.S. Survey Feet

DEM (Continued)

VEGETATED VERTICAL ACCURACY	
LAND COVER TYPE	FOREST
Minimum DZ	-0.236
Maximum DZ	0.481
Mean DZ	0.204
Mean Magnitude DZ	0.483
Number Observations	20
Standard Deviation DZ	0.183
RMSE Z	0.271
95th percentile	0.437
Units	U.S. Survey Feet

VEGETATED VERTICAL ACCURACY	
LAND COVER TYPE	TALL WEEDS
Minimum DZ	0.017
Maximum DZ	0.599
Mean DZ	0.236
Mean Magnitude DZ	0.486
Number Observations	24
Standard Deviation DZ	0.147
RMSE Z	0.277
95th percentile	0.446
Units	U.S. Survey Feet

Point: 1001 Bare Earth

Survey X: 754951.56, Survey Y: 102732.97, Z1: 1149.11, Z DEM: 1149.02, Z LAS: 1148.9, ΔZ DEM: -0.08, ΔZ LAS: -0.21



North



South



East



West

Point: 1002 Urban Area

Survey X: 754876.33, Survey Y: 102882.98, Z1: 1152.23, Z DEM: 1152.23, Z LAS: 1152.14, ΔZ DEM: 0, ΔZ LAS: -0.09



North



South



East



West

Point: 1003 Tall Weeds

Survey X: 755142.76, Survey Y: 102576.42, Z1: 1152.76, Z DEM: 1152.99, Z LAS: 1153.1, ΔZ DEM: 0.23, ΔZ LAS: 0.34



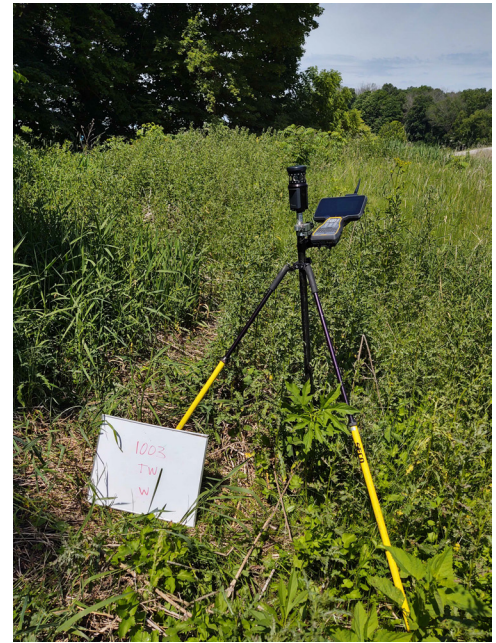
North



South



East



West

Point: 1004 Forested Area

Survey X: 755118.18, Survey Y: 102856.66, Z1: 1169.37, Z DEM: 1169.75, Z LAS: 1169.65, ΔZ DEM: 0.38, ΔZ LAS: 0.28



North



South



East



West

Point: 1005 Bare Earth

Survey X: 702099.6, Survey Y: 103492.73, Z1: 857.04, Z DEM: 856.96, Z LAS: 857.07, ΔZ DEM: -0.08, ΔZ LAS: 0.03



North



South



East



West

Point: 1006 Tall Weeds

Survey X: 702101.94, Survey Y: 103357.71, Z1: 848.1, Z DEM: 848.12, Z LAS: 848.16, ΔZ DEM: 0.02, ΔZ LAS: 0.06



North



South



East



West

Point: 1007 Forested Area

Survey X: 702050.32, Survey Y: 103371.48, Z1: 848.43, Z DEM: 848.59, Z LAS: 848.56, ΔZ DEM: 0.16, ΔZ LAS: 0.13



North



South



East



West

Point: 1008 Urban Area

Survey X: 686283.41, Survey Y: 101211.3, Z1: 1294.92, Z DEM: 1294.9, Z LAS: 1294.9, ΔZ DEM: -0.02, ΔZ LAS: -0.02



North



South



East



West

Point: 1009 Bare Earth

Survey X: 686360.95, Survey Y: 101230.25, Z1: 1293.33, Z DEM: 1293.36, Z LAS: 1293.27, ΔZ DEM: 0.03, ΔZ LAS: -0.06



North



South



East



West

Point: 1010 Bare Earth

Survey X: 666347.21, Survey Y: 116579.43, Z1: 1204.76, Z DEM: 1204.95, Z LAS: 1204.78, ΔZ DEM: 0.18, ΔZ LAS: 0.02



North



South



East



West

Point: 1011 Urban Area

Survey X: 666432.41, Survey Y: 116503.19, Z1: 1204.07, Z DEM: 1204.07, Z LAS: 1204.03, ΔZ DEM: 0.01, ΔZ LAS: -0.04



North



South



East



West

Point: 1012 Tall Weeds

Survey X: 666506.97, Survey Y: 117711.29, Z1: 1191.24, Z DEM: 1191.69, Z LAS: 1191.8, ΔZ DEM: 0.45, ΔZ LAS: 0.56



North



South



East



West

Point: 1013 Forested Area

Survey X: 666560.89, Survey Y: 117726.28, Z1: 1191.08, Z DEM: 1191.21, Z LAS: 1191.26, ΔZ DEM: 0.13, ΔZ LAS: 0.18



North



South



East



West

Point: 1014 Tall Weeds

Survey X: 698049.09, Survey Y: 151040.71, Z1: 1253.68, Z DEM: 1254.12, Z LAS: 1254.25, ΔZ DEM: 0.44, ΔZ LAS: 0.58



North



South



East



West

Point: 1015 Urban Area

Survey X: 700994.77, Survey Y: 148369.92, Z1: 1230.67, Z DEM: 1230.66, Z LAS: 1230.66, ΔZ DEM: -0.01, ΔZ LAS: -0.01



North



South



East



West

Point: 1016 Bare Earth

Survey X: 700855.53, Survey Y: 148462.11, Z1: 1230.5, Z DEM: 1230.59, Z LAS: 1230.58, ΔZ DEM: 0.09, ΔZ LAS: 0.08



North



South



East



West

Point: 1017 Urban Area

Survey X: 846953.42, Survey Y: 207841.18, Z1: 969.76, Z DEM: 969.77, Z LAS: 969.7, ΔZ DEM: 0.01, ΔZ LAS: -0.06



North



South



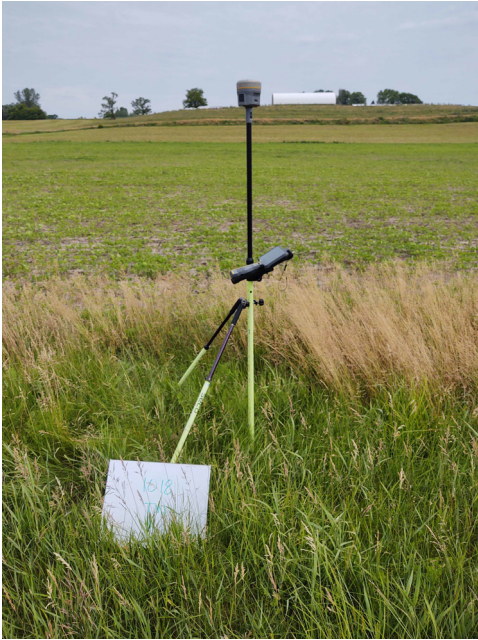
East



West

Point: 1018 Tall Weeds

Survey X: 847116.31, Survey Y: 207871.94, Z1: 967.69, Z DEM: 967.91, Z LAS: 968.02, ΔZ DEM: 0.23, ΔZ LAS: 0.33



North



South



East



West

Point: 1019 Urban Area

Survey X: 850497.34, Survey Y: 187531.7, Z1: 965.63, Z DEM: 965.6, Z LAS: 965.56, ΔZ DEM: -0.03, ΔZ LAS: -0.07



North



South



East



West

Point: 1020 Bare Earth

Survey X: 850384.05, Survey Y: 187442.68, Z1: 963.75, Z DEM: 963.83, Z LAS: 963.73, ΔZ DEM: 0.08, ΔZ LAS: -0.02



North



South



East



West

Point: 1021 Tall Weeds

Survey X: 850291.32, Survey Y: 187544.82, Z1: 961.36, Z DEM: 961.63, Z LAS: 961.78, ΔZ DEM: 0.27, ΔZ LAS: 0.41



North



South



East



West

Point: 1022 Forested Area

Survey X: 850353.96, Survey Y: 187396.45, Z1: 961.57, Z DEM: 961.52, Z LAS: 961.6, ΔZ DEM: -0.05, ΔZ LAS: 0.03



North



South



East



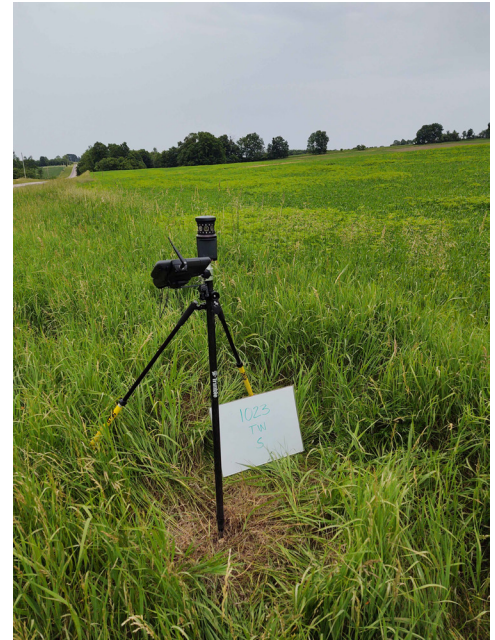
West

Point: 1023 Tall Weeds

Survey X: 849733.99, Survey Y: 156271.11, Z1: 1263.56, Z DEM: 1263.91, Z LAS: 1263.92, ΔZ DEM: 0.34, ΔZ LAS: 0.35



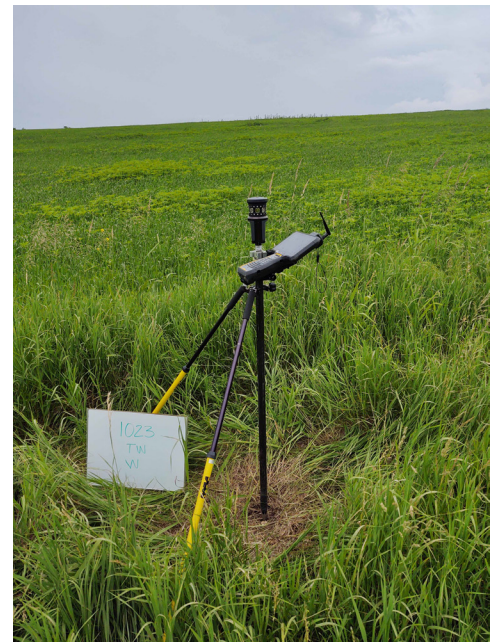
North



South



East



West

Point: 1024 Urban Area

Survey X: 849681.7, Survey Y: 156498.13, Z1: 1277.55, Z DEM: 1277.65, Z LAS: 1277.59, ΔZ DEM: 0.1, ΔZ LAS: 0.04



North



South



East



West

Point: 1025 Forested Area

Survey X: 849827.75, Survey Y: 156584.2, Z1: 1270.68, Z DEM: 1270.89, Z LAS: 1270.94, ΔZ DEM: 0.21, ΔZ LAS: 0.26



North



South



East



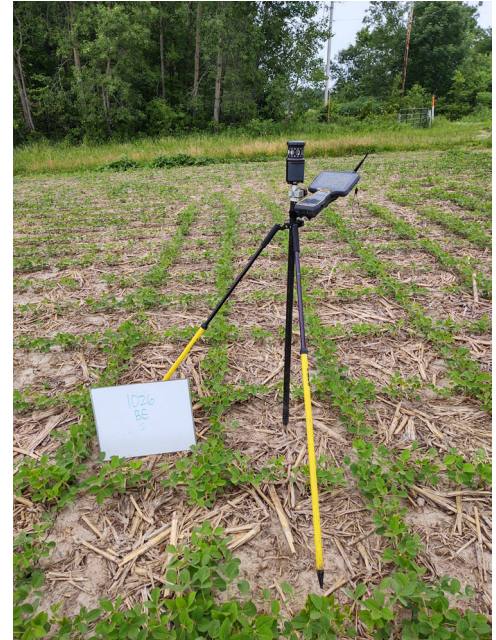
West

Point: 1026 Bare Earth

Survey X: 849817.15, Survey Y: 156679.21, Z1: 1272.95, Z DEM: 1273.13, Z LAS: 1273.19, ΔZ DEM: 0.18, ΔZ LAS: 0.25



North



South



East



West

Point: 1027 Bare Earth

Survey X: 817764.14, Survey Y: 173725.85, Z1: 1347.92, Z DEM: 1347.87, Z LAS: 1347.87, ΔZ DEM: -0.05, ΔZ LAS: -0.04



North



South



East



West

Point: 1028 Urban Area

Survey X: 817684.05, Survey Y: 173646.62, Z1: 1351.28, Z DEM: 1351.29, Z LAS: 1351.25, ΔZ DEM: 0.01, ΔZ LAS: -0.03



North



South



East



West

Point: 1029 Forested Area

Survey X: 817807.15, Survey Y: 173809.86, Z1: 1344.41, Z DEM: 1344.45, Z LAS: 1344.66, ΔZ DEM: 0.04, ΔZ LAS: 0.25



North



South



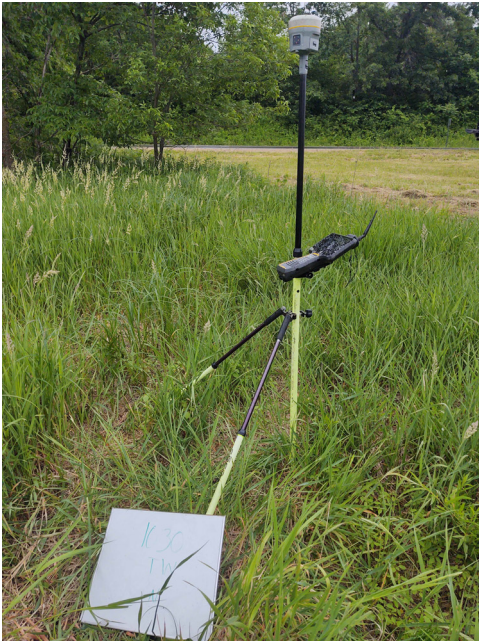
East



West

Point: 1030 Tall Weeds

Survey X: 821710.55, Survey Y: 181482.26, Z1: 1123.14, Z DEM: 1123.74, Z LAS: 1123.85, ΔZ DEM: 0.6, ΔZ LAS: 0.72



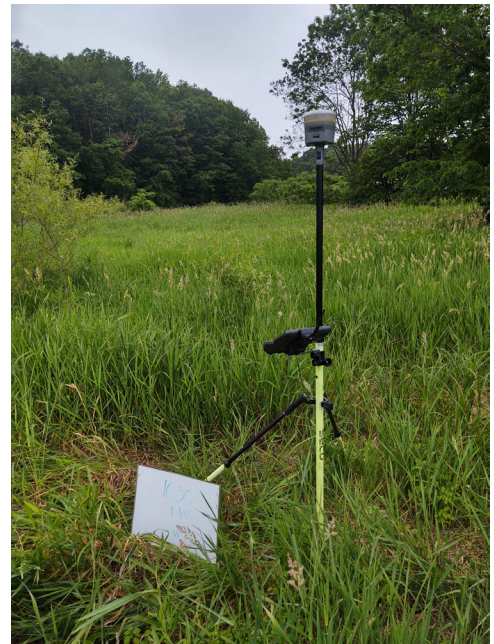
North



South



East



West

Point: 1031 Bare Earth

Survey X: 818033.9, Survey Y: 201689.98, Z1: 1368.6, Z DEM: 1368.91, Z LAS: 1368.8, ΔZ DEM: 0.31, ΔZ LAS: 0.2



North



South



East



West

Point: 1032 Urban Area

Survey X: 817423.61, Survey Y: 201871.53, Z1: 1365.19, Z DEM: 1365.32, Z LAS: 1365.3, ΔZ DEM: 0.13, ΔZ LAS: 0.11



North



South



East



West

Point: 1033 Urban Area

Survey X: 768720.31, Survey Y: 158428.71, Z1: 899.32, Z DEM: 899.28, Z LAS: 899.26, ΔZ DEM: -0.04, ΔZ LAS: -0.05



North



South



East



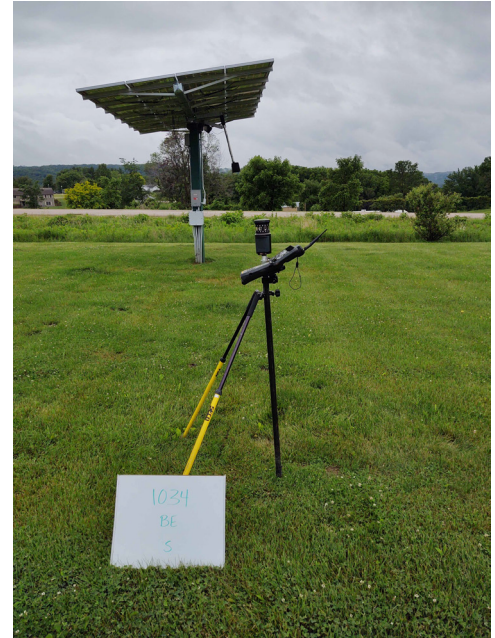
West

Point: 1034 Bare Earth

Survey X: 768863.79, Survey Y: 158573.27, Z1: 903.46, Z DEM: 903.54, Z LAS: 903.45, ΔZ DEM: 0.08, ΔZ LAS: -0.01



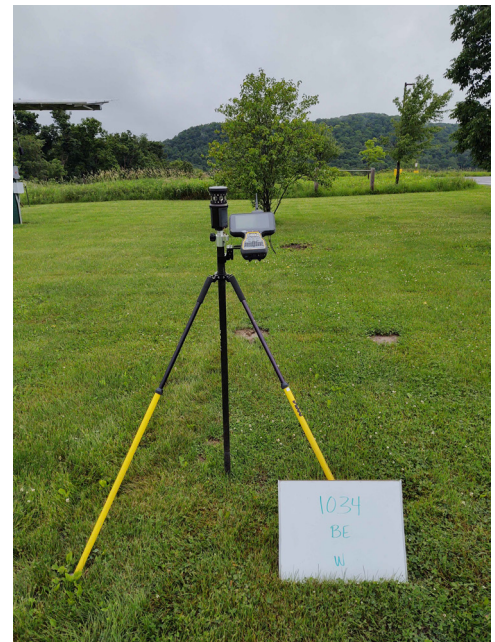
North



South



East



West

Point: 1035 Urban Area

Survey X: 768732.57, Survey Y: 158615.53, Z1: 905.66, Z DEM: 905.59, Z LAS: 905.64, ΔZ DEM: -0.07, ΔZ LAS: -0.02



North



South



East



West

Point: 1036 Tall Weeds

Survey X: 768757.65, Survey Y: 158570.78, Z1: 903.47, Z DEM: 903.61, Z LAS: 903.66, ΔZ DEM: 0.14, ΔZ LAS: 0.19



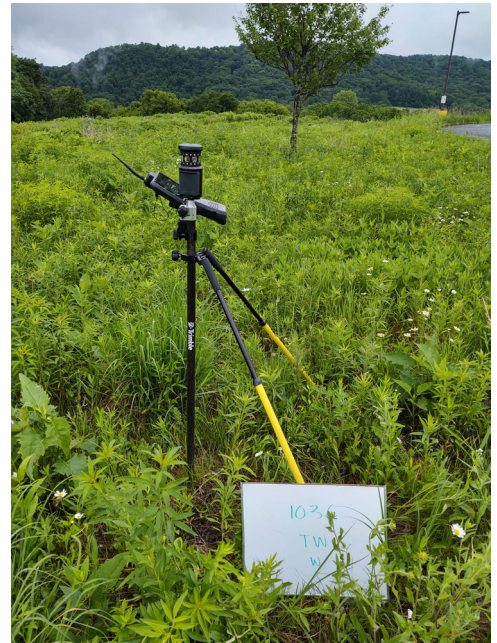
North



South



East



West

Point: 1037 Forested Area

Survey X: 768529.32, Survey Y: 158205.01, Z1: 886.14, Z DEM: 886.16, Z LAS: 886.13, ΔZ DEM: 0.02, ΔZ LAS: -0.01



North



South



East



West

Point: 1038 Urban Area

Survey X: 777845.03, Survey Y: 180514.78, Z1: 885.25, Z DEM: 885.27, Z LAS: 885.28, ΔZ DEM: 0.02, ΔZ LAS: 0.03



North



South



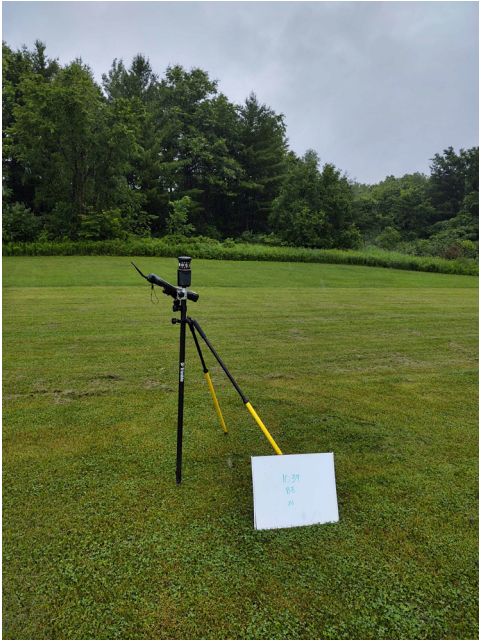
East



West

Point: 1039 Bare Earth

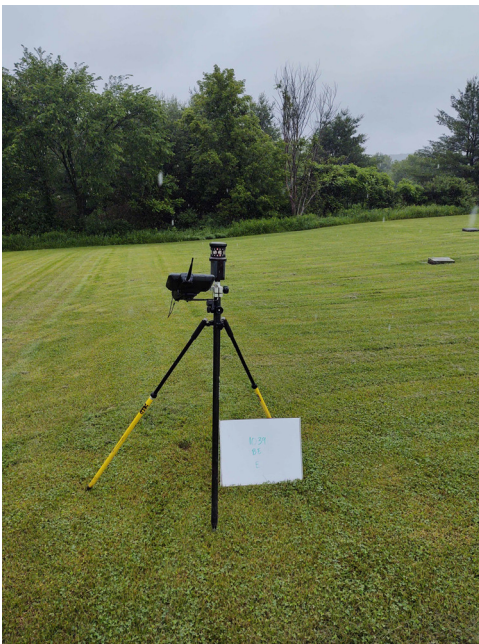
Survey X: 778081.23, Survey Y: 180805.31, Z1: 876.1, Z DEM: 876.21, Z LAS: 876.17, ΔZ DEM: 0.11, ΔZ LAS: 0.07



North



South



East



West

Point: 1040 Forested Area

Survey X: 778032.14, Survey Y: 180955.61, Z1: 866.34, Z DEM: 866.78, Z LAS: 866.76, ΔZ DEM: 0.44, ΔZ LAS: 0.42



North



South



East



West

Point: 1041 Tall Weeds

Survey X: 777955.61, Survey Y: 180906.7, Z1: 863.39, Z DEM: 863.63, Z LAS: 863.81, ΔZ DEM: 0.24, ΔZ LAS: 0.42



North



South



East



West

Point: 1042 Urban Area

Survey X: 780691.59, Survey Y: 211099.63, Z1: 924.5, Z DEM: 924.47, Z LAS: 924.44, ΔZ DEM: -0.03, ΔZ LAS: -0.06



North



South



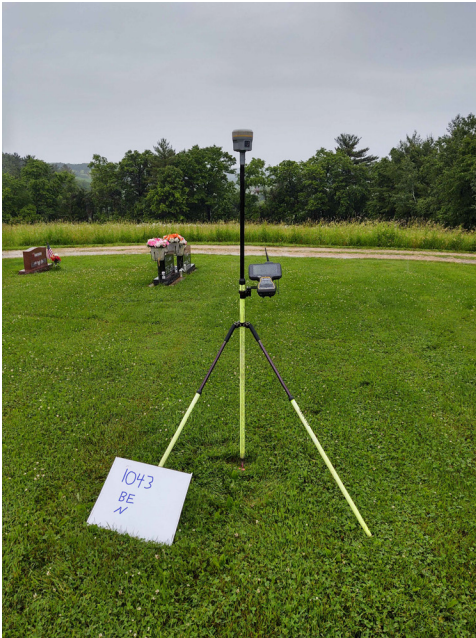
East



West

Point: 1043 Bare Earth

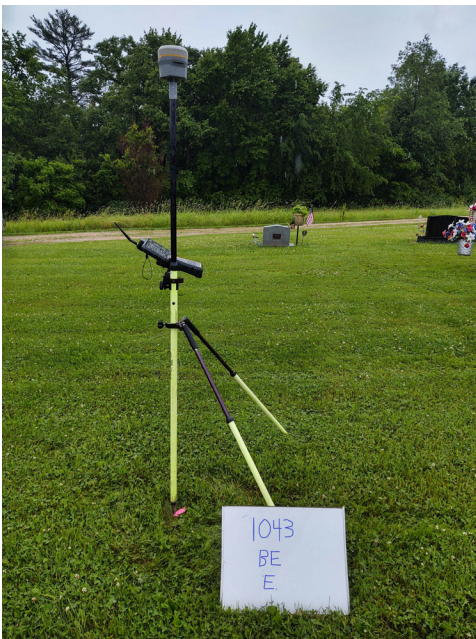
Survey X: 778816.47, Survey Y: 212240.71, Z1: 983.35, Z DEM: 983.44, Z LAS: 983.51, ΔZ DEM: 0.09, ΔZ LAS: 0.17



North



South



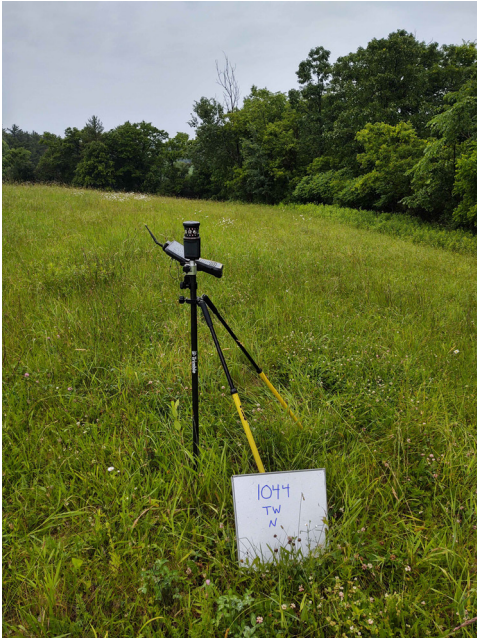
East



West

Point: 1044 Tall Weeds

Survey X: 778918.27, Survey Y: 212226.57, Z1: 979.53, Z DEM: 979.66, Z LAS: 979.68, ΔZ DEM: 0.13, ΔZ LAS: 0.15



North



South



East



West

Point: 1045 Forested Area

Survey X: 778999.81, Survey Y: 212184.61, Z1: 973.94, Z DEM: 974.32, Z LAS: 974.15, ΔZ DEM: 0.38, ΔZ LAS: 0.21



North



South



East



West

Point: 1046 Forested Area

Survey X: 729394.17, Survey Y: 137308.58, Z1: 1199.74, Z DEM: 1199.83, Z LAS: 1200.04, ΔZ DEM: 0.09, ΔZ LAS: 0.3



North



South



East



West

Point: 1047 Urban Area

Survey X: 729448.91, Survey Y: 137363.41, Z1: 1198.07, Z DEM: 1198.08, Z LAS: 1198.01, ΔZ DEM: 0.01, ΔZ LAS: -0.07



North



South



East



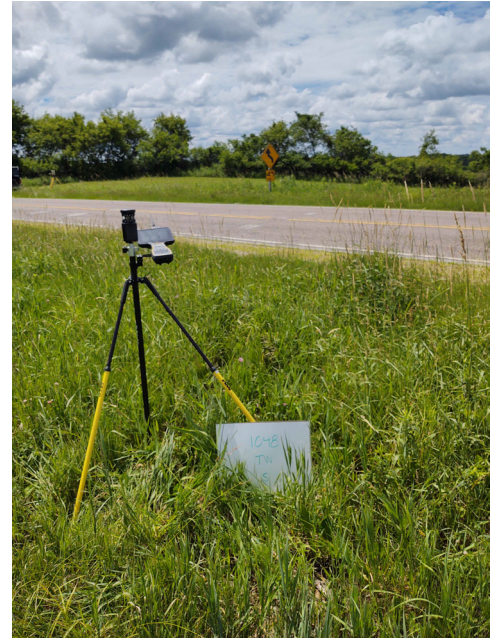
West

Point: 1048 Tall Weeds

Survey X: 729326.25, Survey Y: 137502.33, Z1: 1200.33, Z DEM: 1200.46, Z LAS: 1200.53, ΔZ DEM: 0.13, ΔZ LAS: 0.2



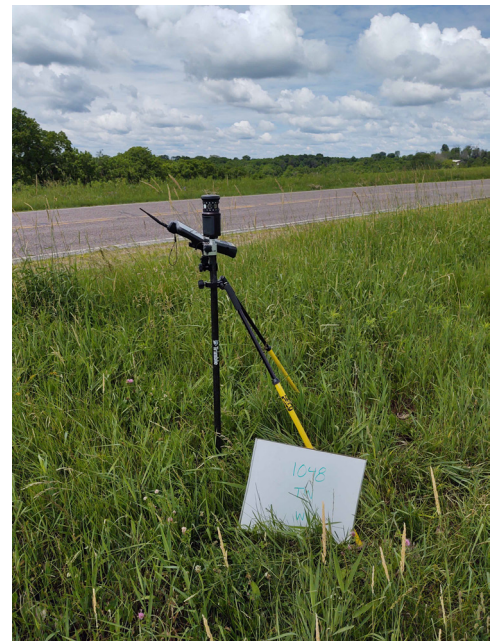
North



South



East



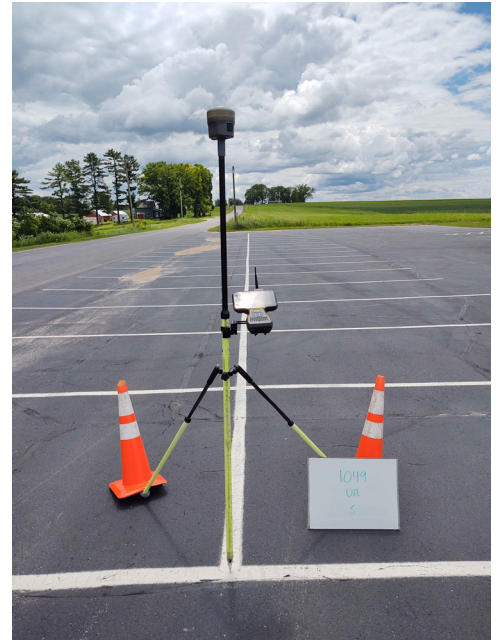
West

Point: 1049 Urban Area

Survey X: 741348.64, Survey Y: 168841.76, Z1: 1265.49, Z DEM: 1265.52, Z LAS: 1265.52, ΔZ DEM: 0.03, ΔZ LAS: 0.04



North



South



East



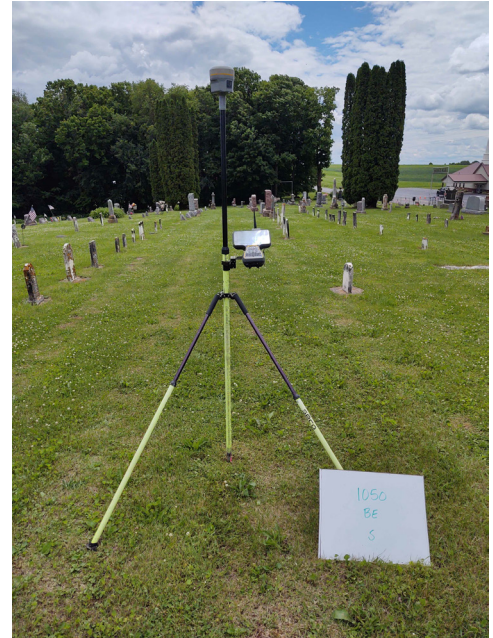
West

Point: 1050 Bare Earth

Survey X: 741487.55, Survey Y: 169153.43, Z1: 1280.96, Z DEM: 1281.08, Z LAS: 1281.02, ΔZ DEM: 0.12, ΔZ LAS: 0.06



North



South



East



West

Point: 1051 Forested Area

Survey X: 741479.15, Survey Y: 168786.51, Z1: 1259.81, Z DEM: 1259.93, Z LAS: 1259.97, ΔZ DEM: 0.12, ΔZ LAS: 0.16



North



South



East



West

Point: 1052 Tall Weeds

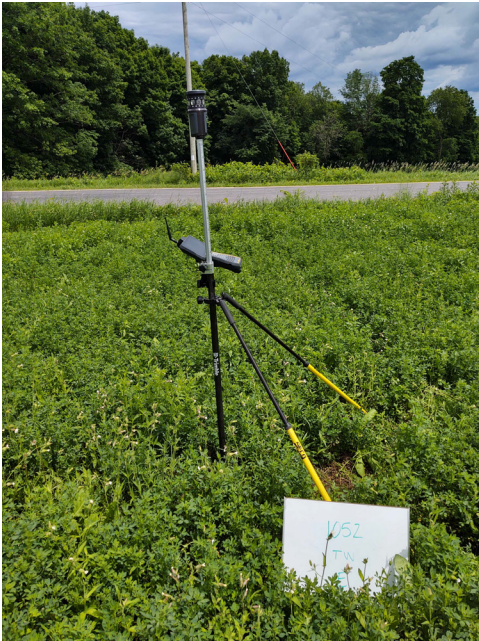
Survey X: 741325.1, Survey Y: 168602.92, Z1: 1263.95, Z DEM: 1264.08, Z LAS: 1264.12, ΔZ DEM: 0.13, ΔZ LAS: 0.16



North



South



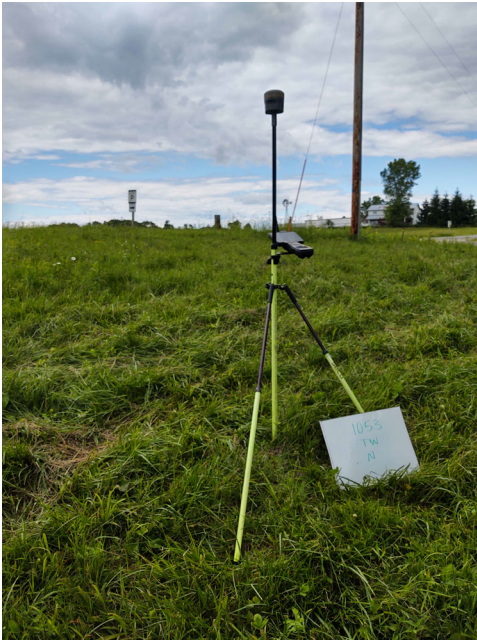
East



West

Point: 1053 Tall Weeds

Survey X: 743558.89, Survey Y: 188503.99, Z1: 1213.03, Z DEM: 1213.1, Z LAS: 1213.36, ΔZ DEM: 0.07, ΔZ LAS: 0.33



North



South



East



West

Point: 1054 Bare Earth

Survey X: 743984.02, Survey Y: 195076.41, Z1: 1224.6, Z DEM: 1224.45, Z LAS: 1224.5, ΔZ DEM: -0.15, ΔZ LAS: -0.11



North



South



East



West

Point: 1055 Urban Area

Survey X: 744321.66, Survey Y: 195013.79, Z1: 1240.7, Z DEM: 1240.75, Z LAS: 1240.68, ΔZ DEM: 0.05, ΔZ LAS: -0.02



North



South



East



West

Point: 1056 Forested Area

Survey X: 749136.1, Survey Y: 200144.46, Z1: 1262.72, Z DEM: 1263.07, Z LAS: 1262.87, ΔZ DEM: 0.35, ΔZ LAS: 0.15



North



South



East



West

Point: 1057 Urban Area

Survey X: 709847.78, Survey Y: 184357.7, Z1: 1282.57, Z DEM: 1282.6, Z LAS: 1282.58, ΔZ DEM: 0.03, ΔZ LAS: 0.01



North



South



East



West

Point: 1058 Bare Earth

Survey X: 709744.05, Survey Y: 184247.56, Z1: 1283.14, Z DEM: 1283.27, Z LAS: 1283.22, ΔZ DEM: 0.13, ΔZ LAS: 0.08



North



South



East



West

Point: 1059 Tall Weeds

Survey X: 713062.94, Survey Y: 184499.9, Z1: 1233.78, Z DEM: 1233.91, Z LAS: 1233.93, ΔZ DEM: 0.13, ΔZ LAS: 0.15



North



South



East



West

Point: 1060 Forested Area

Survey X: 713099.51, Survey Y: 184479.77, Z1: 1228.93, Z DEM: 1229.27, Z LAS: 1229.14, ΔZ DEM: 0.34, ΔZ LAS: 0.21



North



South



East



West

Point: 1061 Urban Area

Survey X: 684560.39, Survey Y: 170204.04, Z1: 1247.58, Z DEM: 1247.67, Z LAS: 1247.69, ΔZ DEM: 0.09, ΔZ LAS: 0.11



North



South



East



West

Point: 1062 Tall Weeds

Survey X: 684518.75, Survey Y: 170252.11, Z1: 1247.57, Z DEM: 1247.76, Z LAS: 1247.9, ΔZ DEM: 0.2, ΔZ LAS: 0.34



North



South



East



West

Point: 1063 Bare Earth

Survey X: 679005.22, Survey Y: 209582.78, Z1: 756.74, Z DEM: 756.83, Z LAS: 756.81, ΔZ DEM: 0.09, ΔZ LAS: 0.07



North



South



East



West

Point: 1064 Urban Area

Survey X: 679544.61, Survey Y: 209747.66, Z1: 759.08, Z DEM: 759.18, Z LAS: 759.16, ΔZ DEM: 0.1, ΔZ LAS: 0.08



North



South



East



West

Point: 1065 Forested Area

Survey X: 678884.47, Survey Y: 209805.34, Z1: 754.02, Z DEM: 754.5, Z LAS: 754.4, ΔZ DEM: 0.48, ΔZ LAS: 0.38



North



South



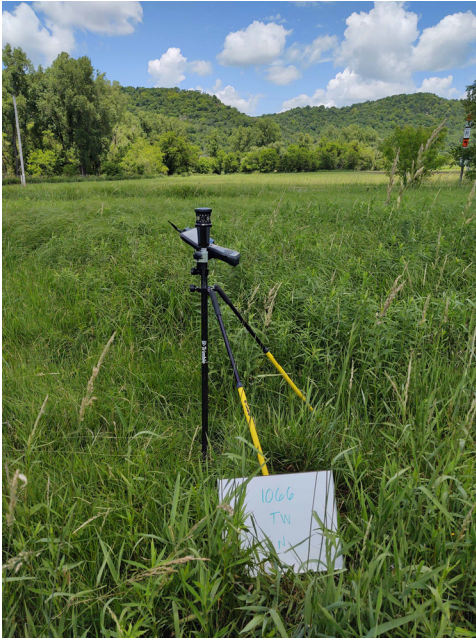
East



West

Point: 1066 Tall Weeds

Survey X: 679066.68, Survey Y: 209567.87, Z1: 755.45, Z DEM: 755.76, Z LAS: 755.8, ΔZ DEM: 0.31, ΔZ LAS: 0.35



North



South



East



West

Point: 1067 Bare Earth

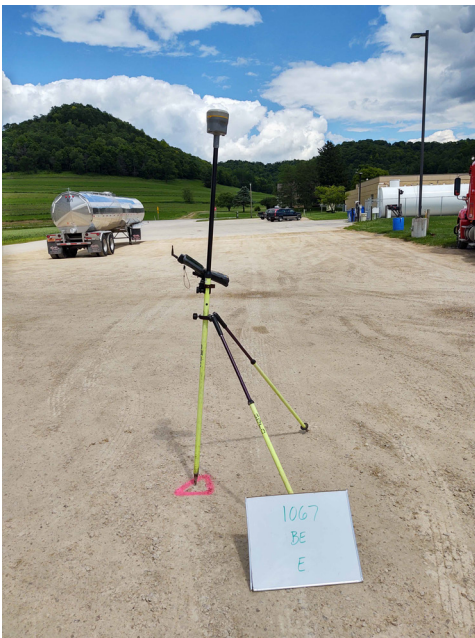
Survey X: 645807.31, Survey Y: 189453.45, Z1: 718.32, Z DEM: 718.24, Z LAS: 718.2, ΔZ DEM: -0.08, ΔZ LAS: -0.12



North



South



East



West

Point: 1068 Urban Area

Survey X: 646128.94, Survey Y: 189504.58, Z1: 723.57, Z DEM: 723.58, Z LAS: 723.56, ΔZ DEM: 0.01, ΔZ LAS: -0.01



North



South



East



West

Point: 1069 Forested Area

Survey X: 645561.75, Survey Y: 189401.18, Z1: 714.42, Z DEM: 714.57, Z LAS: 714.59, ΔZ DEM: 0.15, ΔZ LAS: 0.17



North



South



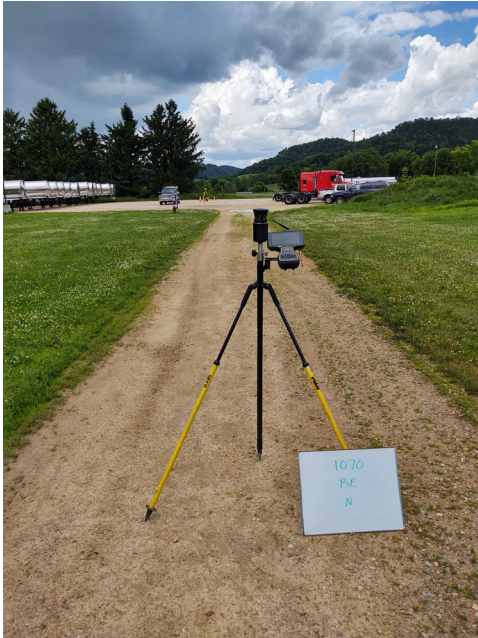
East



West

Point: 1070 Bare Earth

Survey X: 645840.62, Survey Y: 189219.09, Z1: 719.24, Z DEM: 719.23, Z LAS: 719.19, ΔZ DEM: -0.01, ΔZ LAS: -0.05



North



South



East



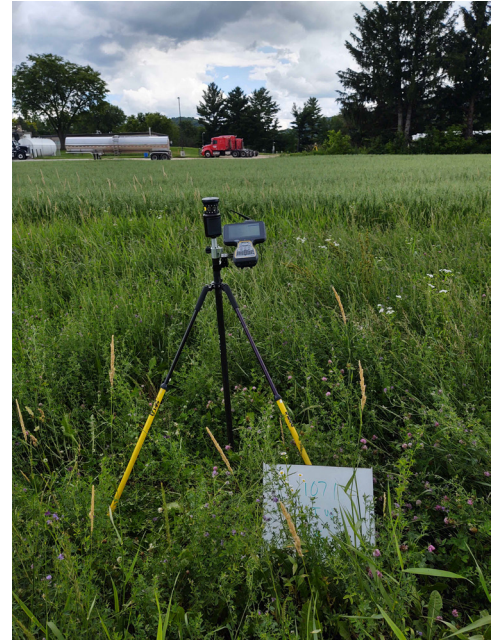
West

Point: 1071 Tall Weeds

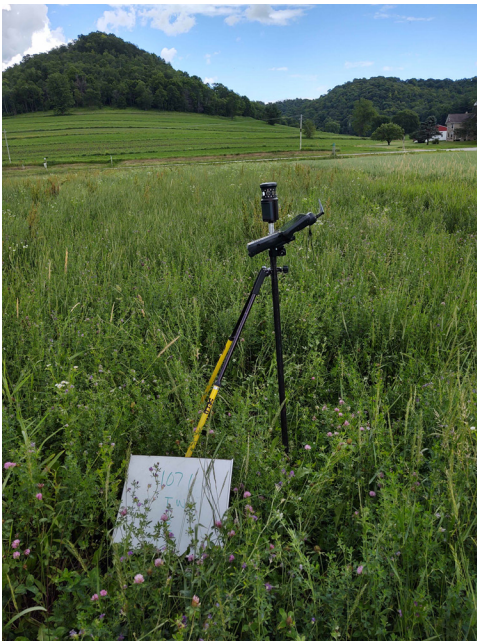
Survey X: 645802.77, Survey Y: 189685.05, Z1: 715.2, Z DEM: 715.24, Z LAS: 715.18, ΔZ DEM: 0.04, ΔZ LAS: -0.02



North



South



East



West

Point: 1072 Bare Earth

Survey X: 660299.93, Survey Y: 171225.55, Z1: 1222.8, Z DEM: 1222.8, Z LAS: 1222.85, ΔZ DEM: 0, ΔZ LAS: 0.04



North



South



East



West

Point: 1073 Urban Area

Survey X: 660226.68, Survey Y: 171176.25, Z1: 1221.46, Z DEM: 1221.54, Z LAS: 1221.48, ΔZ DEM: 0.08, ΔZ LAS: 0.02



North



South



East



West

Point: 1074 Tall Weeds

Survey X: 660137.53, Survey Y: 171155.18, Z1: 1217.78, Z DEM: 1218.09, Z LAS: 1218.07, ΔZ DEM: 0.3, ΔZ LAS: 0.29



North



South



East



West

Point: 1075 Bare Earth

Survey X: 643913.97, Survey Y: 172806.01, Z1: 1206.45, Z DEM: 1206.76, Z LAS: 1206.67, ΔZ DEM: 0.31, ΔZ LAS: 0.22



North



South



East



West

Point: 1076 Forested Area

Survey X: 643788.82, Survey Y: 172797.13, Z1: 1209.42, Z DEM: 1209.62, Z LAS: 1209.58, ΔZ DEM: 0.21, ΔZ LAS: 0.17



North



South



East



West

Point: 1077 Urban Area

Survey X: 630701.56, Survey Y: 169928.27, Z1: 1170.9, Z DEM: 1170.87, Z LAS: 1170.86, ΔZ DEM: -0.03, ΔZ LAS: -0.04



North



South



East



West

Point: 1078 Forested Area

Survey X: 630558.22, Survey Y: 169540.05, Z1: 1159.45, Z DEM: 1159.84, Z LAS: 1159.92, ΔZ DEM: 0.39, ΔZ LAS: 0.48



North



South



East



West

Point: 1079 Tall Weeds

Survey X: 630702.36, Survey Y: 169461.12, Z1: 1169.87, Z DEM: 1169.96, Z LAS: 1170.05, ΔZ DEM: 0.09, ΔZ LAS: 0.17



North



South



East



West

Point: 1080 Bare Earth

Survey X: 628005.98, Survey Y: 170980.84, Z1: 1161.03, Z DEM: 1161.01, Z LAS: 1160.91, ΔZ DEM: -0.02, ΔZ LAS: -0.12



North



South



East



West

Point: 1081 Bare Earth

Survey X: 619879.56, Survey Y: 210666.26, Z1: 642.27, Z DEM: 642.31, Z LAS: 642.29, ΔZ DEM: 0.04, ΔZ LAS: 0.02



North



South



East



West

Point: 1082 Tall Weeds

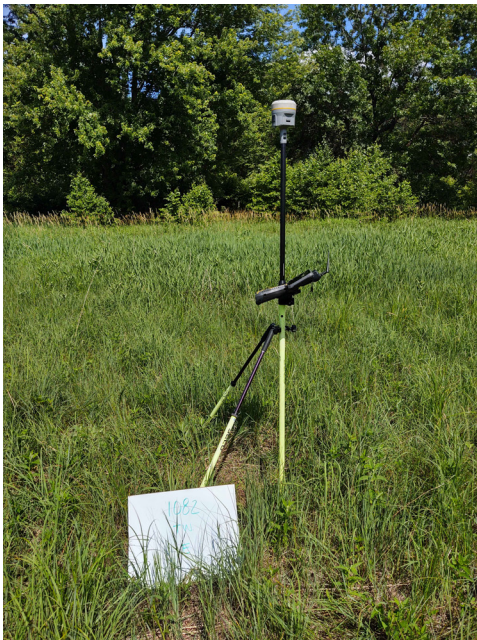
Survey X: 611741.9, Survey Y: 208794.67, Z1: 634.88, Z DEM: 634.98, Z LAS: 635.04, ΔZ DEM: 0.1, ΔZ LAS: 0.16



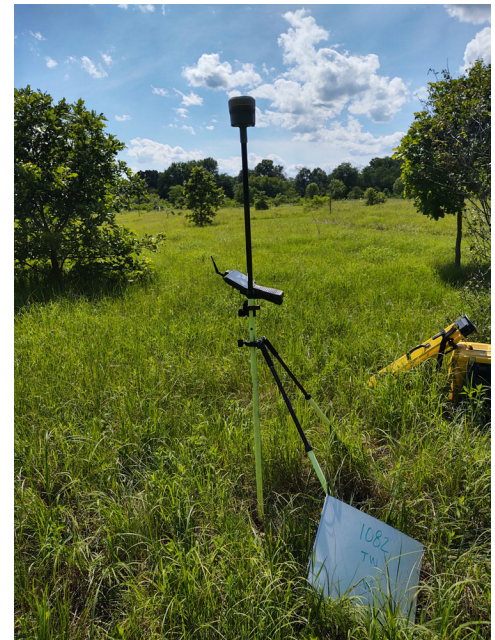
North



South



East



West

Point: 1083 Urban Area

Survey X: 611802.18, Survey Y: 208555.75, Z1: 638.13, Z DEM: 638.07, Z LAS: 637.86, ΔZ DEM: -0.05, ΔZ LAS: -0.27



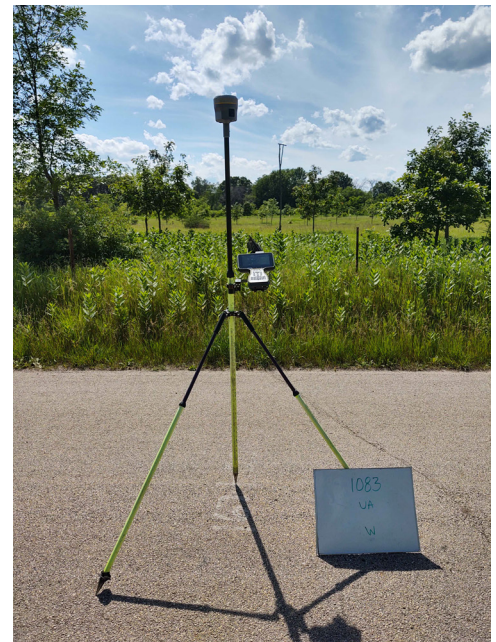
North



South



East



West

Point: 1084 Bare Earth

Survey X: 611793.18, Survey Y: 208767.16, Z1: 634.36, Z DEM: 634.11, Z LAS: 634.05, ΔZ DEM: -0.25, ΔZ LAS: -0.3



North



South



East



West

Point: 1085 Forested Area

Survey X: 611858.92, Survey Y: 208765.82, Z1: 634.82, Z DEM: 634.58, Z LAS: 634.53, ΔZ DEM: -0.24, ΔZ LAS: -0.29



North



South



East



West

Point: 1086 Bare Earth

Survey X: 634208.55, Survey Y: 118641.48, Z1: 1305.34, Z DEM: 1305.42, Z LAS: 1305.42, ΔZ DEM: 0.09, ΔZ LAS: 0.08



North



South



East



West

Point: 1087 Urban Area

Survey X: 634322.64, Survey Y: 118713.38, Z1: 1308.9, Z DEM: 1308.93, Z LAS: 1308.99, ΔZ DEM: 0.02, ΔZ LAS: 0.09



North



South



East



West

Point: 1088 Bare Earth

Survey X: 620386.55, Survey Y: 103056.4, Z1: 732.95, Z DEM: 733.02, Z LAS: 733.02, ΔZ DEM: 0.06, ΔZ LAS: 0.07



North



South



East



West

Point: 1089 Forested Area

Survey X: 620354.28, Survey Y: 102993.4, Z1: 730.82, Z DEM: 730.98, Z LAS: 730.55, ΔZ DEM: 0.16, ΔZ LAS: -0.28



North



South



East



West

Point: 1090 Urban Area

Survey X: 619030.17, Survey Y: 101053.85, Z1: 639.09, Z DEM: 639.11, Z LAS: 639.07, ΔZ DEM: 0.02, ΔZ LAS: -0.02



North



South



East



West

Point: 1091 Bare Earth

Survey X: 618834.29, Survey Y: 101052.45, Z1: 637.04, Z DEM: 637.16, Z LAS: 637.15, ΔZ DEM: 0.12, ΔZ LAS: 0.11



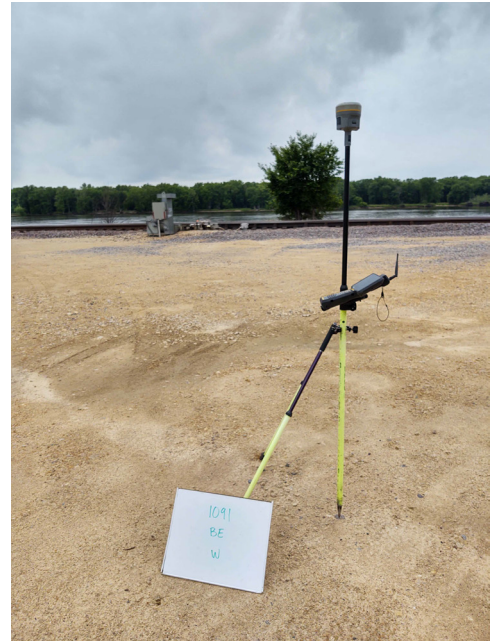
North



South



East



West

Point: 1092 Tall Weeds

Survey X: 618591.66, Survey Y: 101613.18, Z1: 644.67, Z DEM: 645.06, Z LAS: 644.97, ΔZ DEM: 0.39, ΔZ LAS: 0.3



North



South



East



West

Point: 1093 Urban Area

Survey X: 612490.73, Survey Y: 156315.34, Z1: 636.37, Z DEM: 636.34, Z LAS: 636.36, ΔZ DEM: -0.03, ΔZ LAS: -0.01



North



South



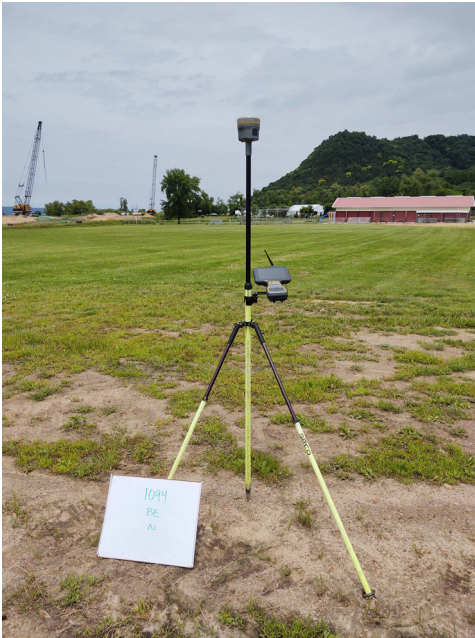
East



West

Point: 1094 Bare Earth

Survey X: 612536.73, Survey Y: 156398.84, Z1: 634.74, Z DEM: 634.74, Z LAS: 634.74, ΔZ DEM: 0, ΔZ LAS: 0.01



North



South



East



West

Point: 1095 Tall Weeds

Survey X: 612493.58, Survey Y: 156991.56, Z1: 631.09, Z DEM: 631.41, Z LAS: 631.4, ΔZ DEM: 0.32, ΔZ LAS: 0.31



North



South



East



West

Point: 1096 Forested Area

Survey X: 661206.38, Survey Y: 146410.64, Z1: 1183.28, Z DEM: 1183.61, Z LAS: 1183.76, ΔZ DEM: 0.33, ΔZ LAS: 0.49



North



South



East



West

Point: 1097 Tall Weeds

Survey X: 661181.96, Survey Y: 146466.04, Z1: 1184.74, Z DEM: 1185.11, Z LAS: 1185.02, ΔZ DEM: 0.37, ΔZ LAS: 0.28



North



South



East



West

Point: 1098 Urban Area

Survey X: 661136.09, Survey Y: 146500.21, Z1: 1186.24, Z DEM: 1186.39, Z LAS: 1186.28, ΔZ DEM: 0.15, ΔZ LAS: 0.04



North



South



East



West

Point: 1099 Bare Earth

Survey X: 661289.2, Survey Y: 150208.65, Z1: 1241.41, Z DEM: 1241.59, Z LAS: 1241.65, ΔZ DEM: 0.17, ΔZ LAS: 0.24



North



South



East



West

Point: 1100 Bare Earth

Survey X: 686361.65, Survey Y: 133591.97, Z1: 1225.49, Z DEM: 1225.55, Z LAS: 1225.49, ΔZ DEM: 0.06, ΔZ LAS: 0.01



North



South



East



West