



Vertical Accuracy Report

Wisconsin WROC - 3DEP 2020

Rock County Lidar

Ingenuity, Integrity, and Intelligence.

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Vertical Accuracy Report

Project Information

Prepared By: Ayres

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

Sensor Info: Riegl 1560l

Required Nominal Pulse Spacing: 0.7

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

Units: U.S. Survey Feet

Date of Acquisition: Start: 4/16/2020 | Finish: 4/26/2020

Report Information

This report documents the absolute vertical accuracy of the lidar data collected for the Rock County, WI, QL2 lidar project. Independent vertical checkpoints were collected by land surveyors using Trimble GNSS equipment connected to WISCRS base stations. The checkpoints were collected from February 27, 2020, to March 3, 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, 47 NVA points and 43 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.

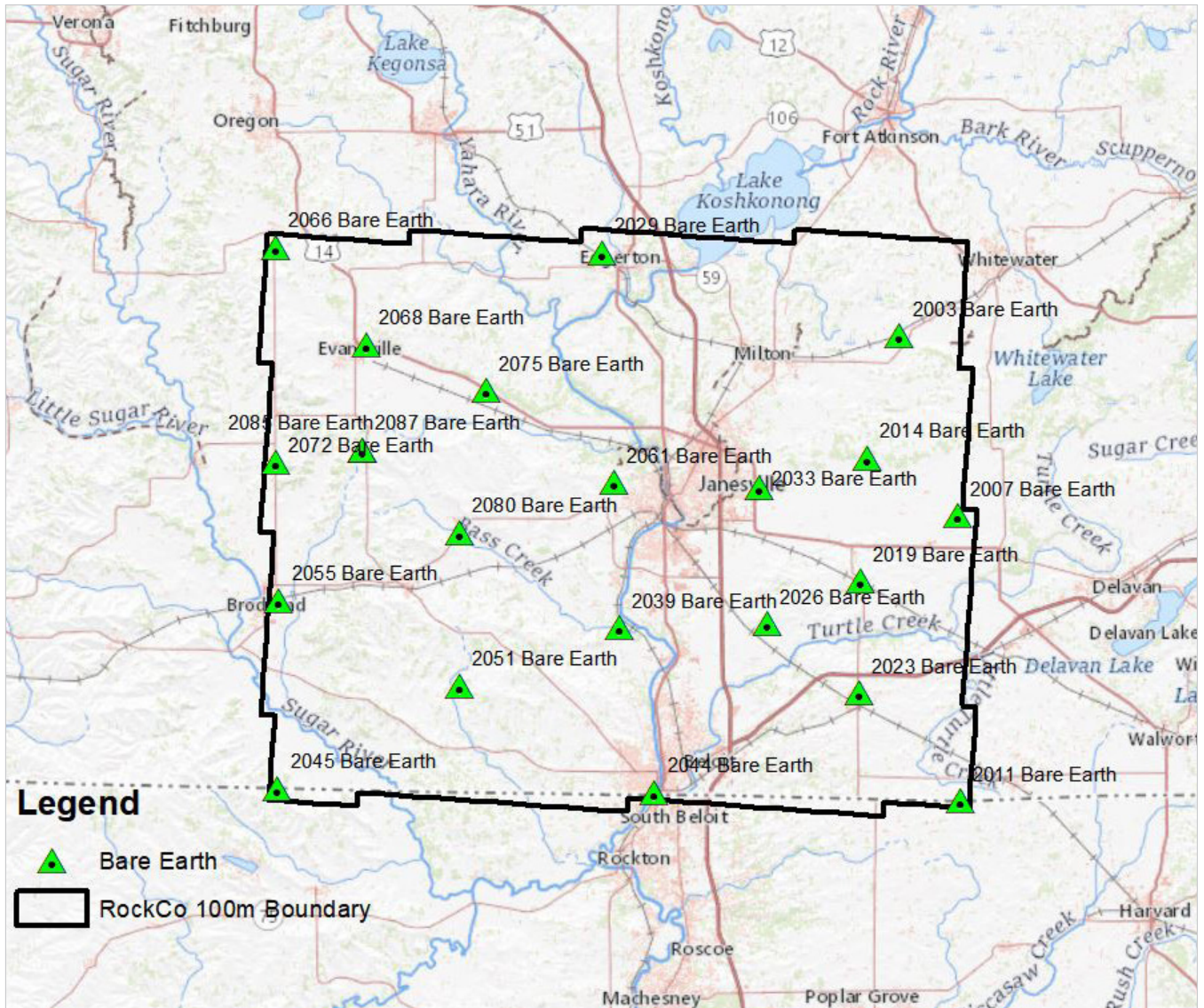
The NVA and VVA statistics for this project are within the above stated specifications.

Lidar Accuracy Assessment Summary

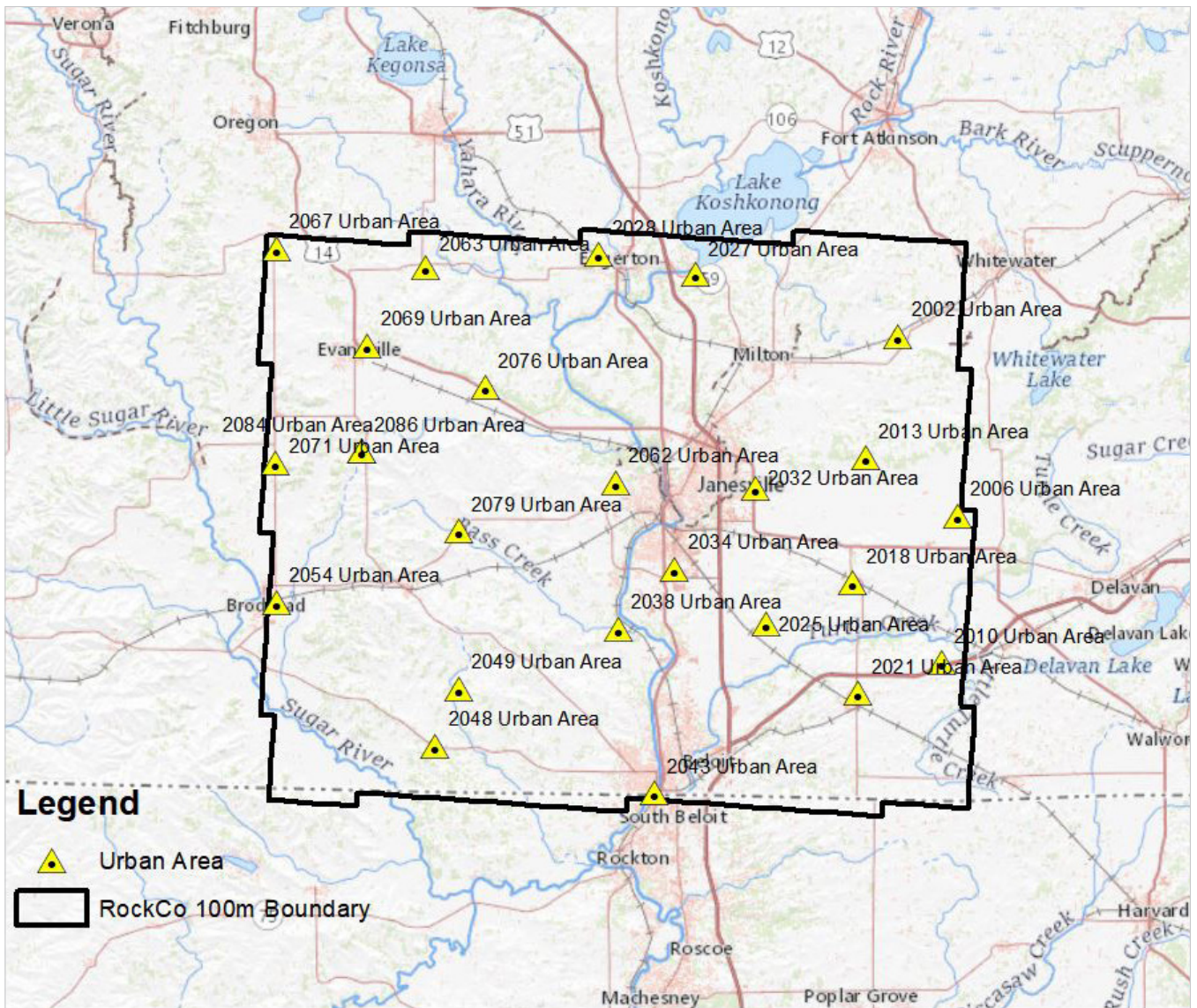
LAND COVER TYPE	# OF POINTS	NVA	VVA
LAS		95% confidence	
Bare Earth	22	0.220	N/A
Urban Area	25	0.238	N/A
Forest	29	N/A	N/A
Tall Weeds	14	N/A	N/A
Total	90	0.230	N/A
DEM		95% confidence	95th percentile
Bare Earth	22	0.255	N/A
Urban Area	25	0.215	N/A
Forest	29	N/A	0.301
Tall Weeds	14	N/A	0.376
Total	90	0.235	0.376

Units: U.S. Survey Feet

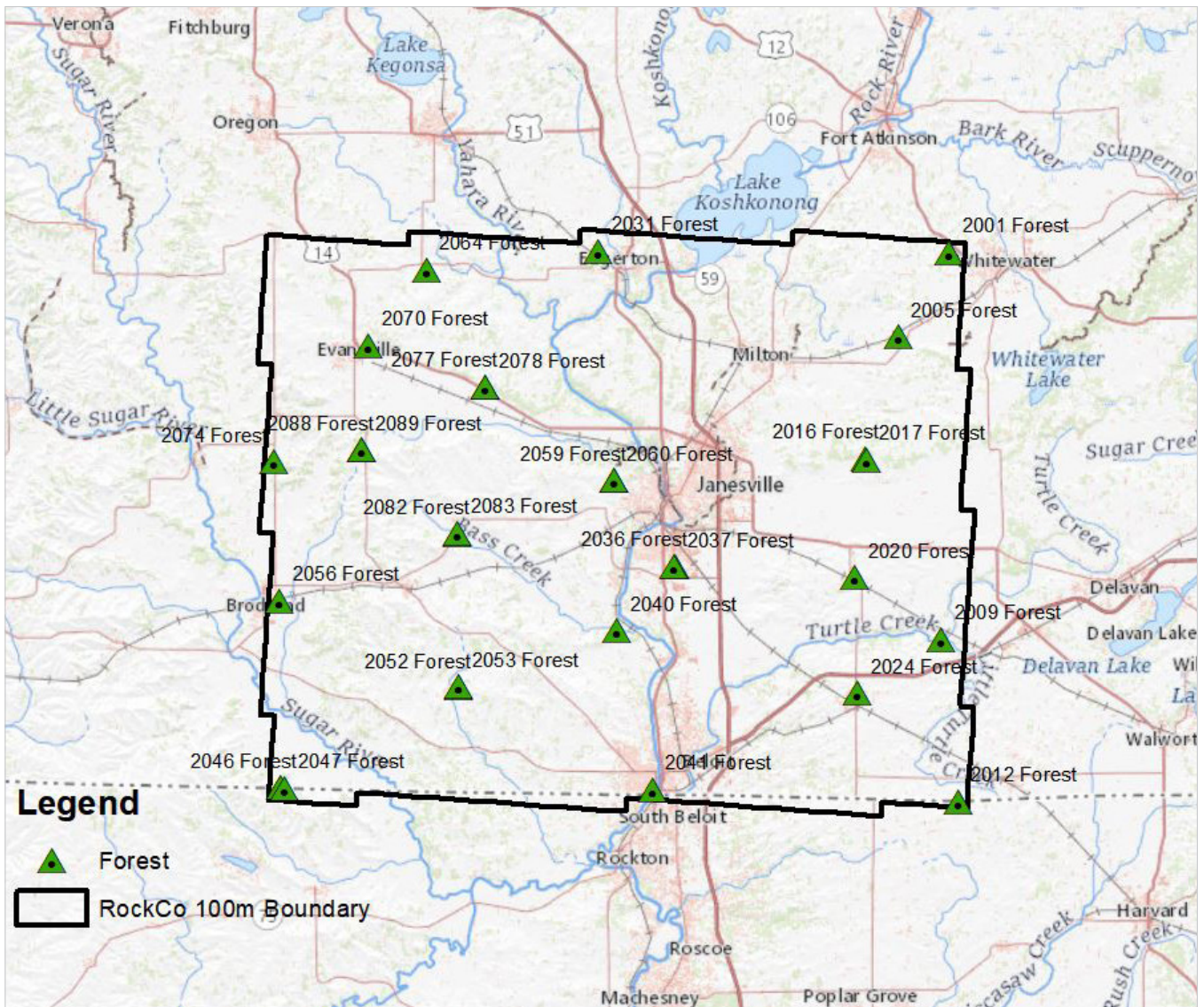
Map of NVA Checkpoint Locations - Bare Earth



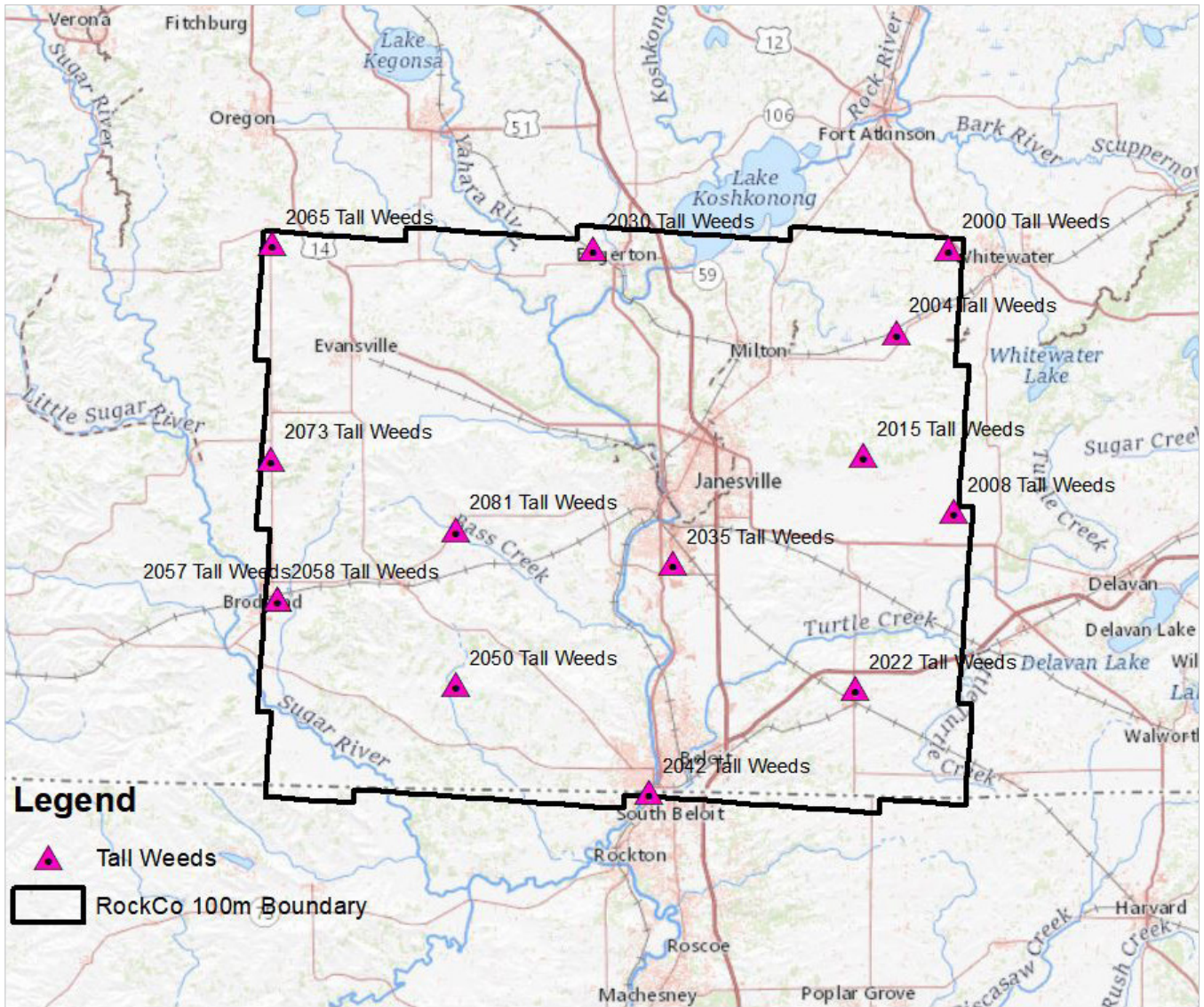
Map of NVA Checkpoint Locations - Urban Areas



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	-0.27
Maximum DZ	0.321
Mean DZ	0.01
Mean Magnitude DZ	0.3
Number Observations	47
Standard Deviation DZ	0.118
RMSE Z	0.117
95% Confidence Level Z	0.23
Units	U.S. Survey Feet

DEM

NONVEGETATED VERTICAL ACCURACY	
LAND COVER TYPE	BARE EARTH, URBAN AREA
Minimum DZ	-0.305
Maximum DZ	0.387
Mean DZ	0.007
Mean Magnitude DZ	0.295
Number Observations	47
Standard Deviation DZ	0.121
RMSE Z	0.12
95% Confidence Level Z	0.235
Units	U.S. Survey Feet

DEM (Continued)

VEGETATED VERTICAL ACCURACY	
LAND COVER TYPE	FOREST
Minimum DZ	-0.177
Maximum DZ	0.452
Mean DZ	0.089
Mean Magnitude DZ	0.327
Number Observations	29
Standard Deviation DZ	0.122
RMSE Z	0.15
95th percentile	0.301
Units	U.S. Survey Feet

VEGETATED VERTICAL ACCURACY	
LAND COVER TYPE	TALL WEEDS
Minimum DZ	-0.01
Maximum DZ	0.558
Mean DZ	0.192
Mean Magnitude DZ	0.439
Number Observations	14
Standard Deviation DZ	0.156
RMSE Z	0.244
95th percentile	0.376
Units	U.S. Survey Feet

Point: 2000 Tall Weeds

Survey X: 557973.94, Survey Y: 327383.59, Z1: 841.33, Z DEM: 841.42, Z LAS: 841.48, ΔZ DEM: 0.09, ΔZ LAS: 0.15



North



South



East



West

Point: 2001 Forested

Survey X: 557750.55, Survey Y: 327366.5, Z1: 832.85, Z DEM: 833.04, Z LAS: 833.1, ΔZ DEM: 0.19, ΔZ LAS: 0.25



North



South



East



West

Point: 2002 Urban Area

Survey X: 545626.88, Survey Y: 307919.79, Z1: 894.93, Z DEM: 894.95, Z LAS: 894.91, ΔZ DEM: 0.02, ΔZ LAS: -0.02



North



South



East



West

Point: 2003 Bare Earth

Survey X: 545670.61, Survey Y: 307790.22, Z1: 893.99, Z DEM: 893.88, Z LAS: 893.91, ΔZ DEM: -0.11, ΔZ LAS: -0.08



North



South



East



West

Point: 2004 Tall Weeds

Survey X: 545744.29, Survey Y: 307960.33, Z1: 897.74, Z DEM: 897.97, Z LAS: 898.01, ΔZ DEM: 0.23, ΔZ LAS: 0.27



North



South



East



West

Point: 2005 Forested

Survey X: 545762.98, Survey Y: 307831.9, Z1: 896.54, Z DEM: 896.58, Z LAS: 896.79, ΔZ DEM: 0.04, ΔZ LAS: 0.26



North



South



East



West

Point: 2006 Urban Area

Survey X: 559366.01, Survey Y: 266156.27, Z1: 947.78, Z DEM: 947.75, Z LAS: 947.76, ΔZ DEM: -0.03, ΔZ LAS: -0.02



North



South



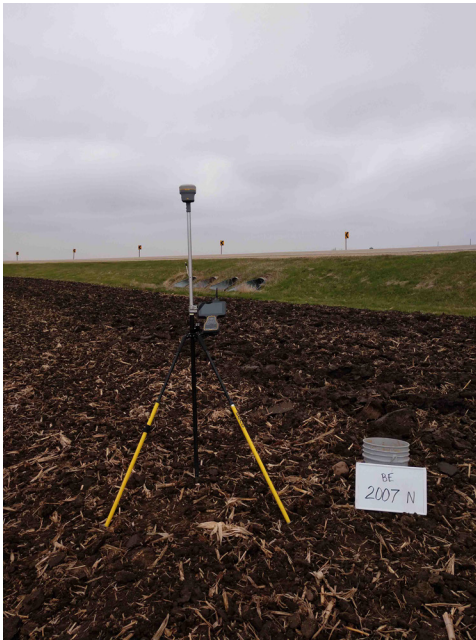
East



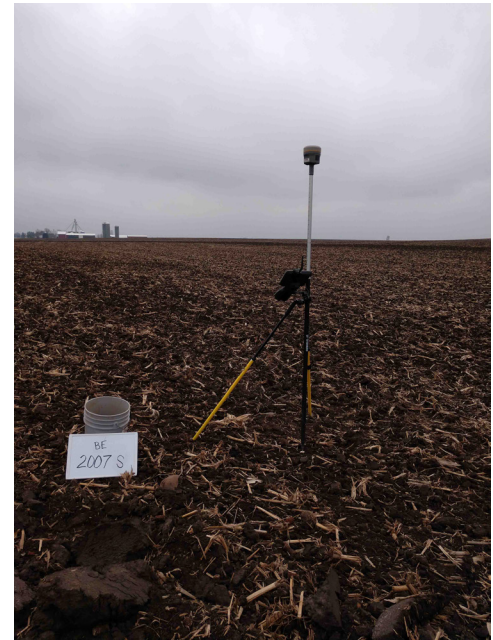
West

Point: 2007 Bare Earth

Survey X: 559226.03, Survey Y: 266025.86, Z1: 939.7, Z DEM: 939.7, Z LAS: 939.73, ΔZ DEM: 0.01, ΔZ LAS: 0.04



North



South



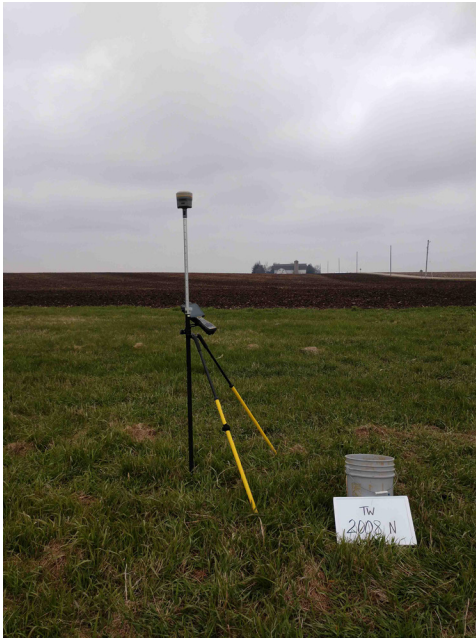
East



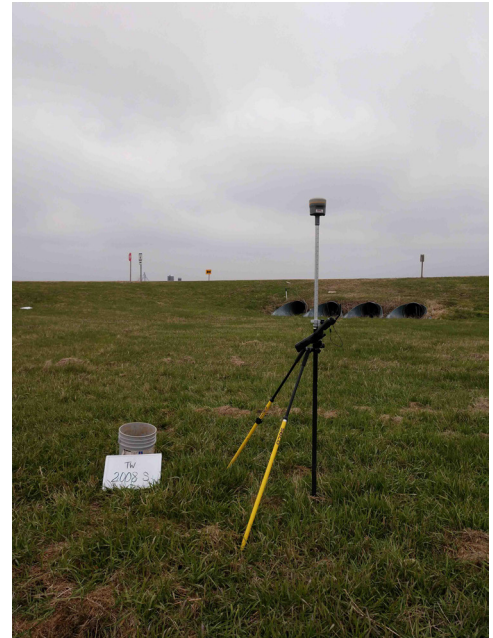
West

Point: 2008 Tall Weeds

Survey X: 559297.83, Survey Y: 266280.65, Z1: 941.03, Z DEM: 941.12, Z LAS: 941.16, ΔZ DEM: 0.09, ΔZ LAS: 0.12



North



South



East



West

Point: 2009 Forested

Survey X: 555891.53, Survey Y: 237342.93, Z1: 842.92, Z DEM: 842.99, Z LAS: 842.96, ΔZ DEM: 0.07, ΔZ LAS: 0.04



North



South



East



West

Point: 2010 Urban Area

Survey X: 555723.54, Survey Y: 231939, Z1: 928.53, Z DEM: 928.64, Z LAS: 928.71, ΔZ DEM: 0.11, ΔZ LAS: 0.18



North



South



East



West

Point: 2011 Bare Earth

Survey X: 559669.44, Survey Y: 199749.43, Z1: 962.05, Z DEM: 962.26, Z LAS: 962.2, ΔZ DEM: 0.21, ΔZ LAS: 0.14



North



South



East



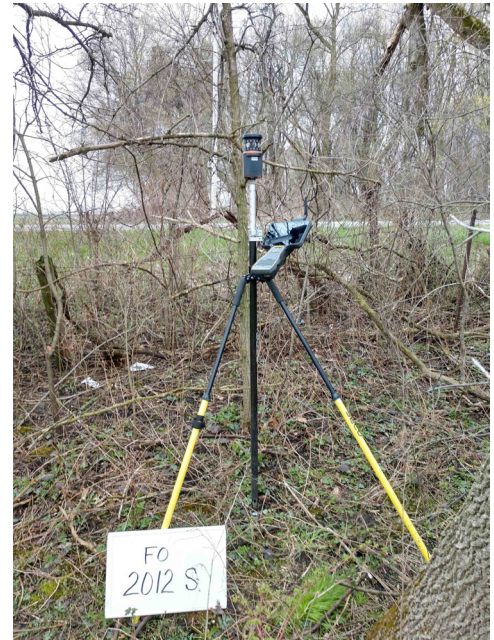
West

Point: 2012 Forested

Survey X: 559698.4, Survey Y: 199695.37, Z1: 962.71, Z DEM: 962.98, Z LAS: 962.98, ΔZ DEM: 0.27, ΔZ LAS: 0.27



North



South



East



West

Point: 2013 Urban Area

Survey X: 538062.9, Survey Y: 279645.11, Z1: 980.72, Z DEM: 980.76, Z LAS: 980.67, ΔZ DEM: 0.04, ΔZ LAS: -0.05



North



South



East



West

Point: 2014 Bare Earth

Survey X: 538160.41, Survey Y: 279478.99, Z1: 982.1, Z DEM: 982.15, Z LAS: 982.26, ΔZ DEM: 0.05, ΔZ LAS: 0.16



North



South



East



West

Point: 2015 Tall Weeds

Survey X: 538067.47, Survey Y: 279367.82, Z1: 975.53, Z DEM: 975.52, Z LAS: 975.59, ΔZ DEM: -0.01, ΔZ LAS: 0.05



North



South



East



West

Point: 2016 Forested

Survey X: 538252.64, Survey Y: 279420.5, Z1: 996.02, Z DEM: 996.07, Z LAS: 996.48, ΔZ DEM: 0.05, ΔZ LAS: 0.46



North



South



East



West

Point: 2017 Forested

Survey X: 538380.17, Survey Y: 279131.09, Z1: 995.52, Z DEM: 995.75, Z LAS: 995.74, ΔZ DEM: 0.23, ΔZ LAS: 0.21



North



South



East



West

Point: 2018 Urban Area

Survey X: 535091.27, Survey Y: 250591.67, Z1: 965.82, Z DEM: 965.59, Z LAS: 965.58, ΔZ DEM: -0.24, ΔZ LAS: -0.25



North



South



East



West

Point: 2019 Bare Earth

Survey X: 536573.76, Survey Y: 250920.02, Z1: 949.83, Z DEM: 949.77, Z LAS: 949.81, ΔZ DEM: -0.06, ΔZ LAS: -0.01



North



South



East



West

Point: 2020 Forested

Survey X: 535737.17, Survey Y: 251855.73, Z1: 963.97, Z DEM: 963.95, Z LAS: 964.21, ΔZ DEM: -0.01, ΔZ LAS: 0.24



North



South



East



West

Point: 2021 Urban Area

Survey X: 536355.93, Survey Y: 224821.62, Z1: 1007.04, Z DEM: 1007.07, Z LAS: 1007.1, ΔZ DEM: 0.03, ΔZ LAS: 0.06



North



South



East



West

Point: 2022 Tall Weeds

Survey X: 536378.52, Survey Y: 225193, Z1: 988.09, Z DEM: 988.24, Z LAS: 988.19, ΔZ DEM: 0.15, ΔZ LAS: 0.1



North



South



East



West

Point: 2023 Bare Earth

Survey X: 536247.49, Survey Y: 224824.15, Z1: 1003.36, Z DEM: 1003.45, Z LAS: 1003.48, ΔZ DEM: 0.09, ΔZ LAS: 0.11



North



South



East



West

Point: 2024 Forested

Survey X: 536296.91, Survey Y: 224894.77, Z1: 1002.4, Z DEM: 1002.39, Z LAS: 1002.46, ΔZ DEM: -0.01, ΔZ LAS: 0.06



North



South



East



West

Point: 2025 Urban Area

Survey X: 514856.8, Survey Y: 240924.29, Z1: 857.48, Z DEM: 857.44, Z LAS: 857.34, ΔZ DEM: -0.03, ΔZ LAS: -0.14



North



South



East



West

Point: 2026 Bare Earth

Survey X: 514908.1, Survey Y: 240957.28, Z1: 855.14, Z DEM: 855.17, Z LAS: 855.19, ΔZ DEM: 0.04, ΔZ LAS: 0.05



North



South



East



West

Point: 2027 Urban Area

Survey X: 498481.46, Survey Y: 322461.51, Z1: 795.22, Z DEM: 795.19, Z LAS: 795.24, ΔZ DEM: -0.03, ΔZ LAS: 0.03



North



South



East



West

Point: 2028 Urban Area

Survey X: 476043.65, Survey Y: 327010.11, Z1: 834.17, Z DEM: 834.27, Z LAS: 834.3, ΔZ DEM: 0.1, ΔZ LAS: 0.13



North



South



East



West

Point: 2029 Bare Earth

Survey X: 476465.51, Survey Y: 327106.33, Z1: 833.08, Z DEM: 833.24, Z LAS: 833.22, ΔZ DEM: 0.16, ΔZ LAS: 0.14



North



South



East



West

Point: 2030 Tall Weeds

Survey X: 475433.4, Survey Y: 327403.41, Z1: 828.68, Z DEM: 829.01, Z LAS: 829.02, ΔZ DEM: 0.33, ΔZ LAS: 0.33



North



South



East



West

Point: 2031 Forested

Survey X: 476078.39, Survey Y: 327666.63, Z1: 824.73, Z DEM: 824.88, Z LAS: 825.08, ΔZ DEM: 0.16, ΔZ LAS: 0.35



North



South



East



West

Point: 2032 Urban Area

Survey X: 512465.02, Survey Y: 272677.41, Z1: 866.83, Z DEM: 866.86, Z LAS: 866.85, ΔZ DEM: 0.03, ΔZ LAS: 0.02



North



South



East



West

Point: 2033 Bare Earth

Survey X: 512991.53, Survey Y: 272667.44, Z1: 867.13, Z DEM: 867.25, Z LAS: 867.15, ΔZ DEM: 0.12, ΔZ LAS: 0.02



North



South



East



West

Point: 2034 Urban Area

Survey X: 493751.21, Survey Y: 253790.84, Z1: 833.61, Z DEM: 833.6, Z LAS: 833.74, ΔZ DEM: -0.01, ΔZ LAS: 0.13



North



South



East



West

Point: 2035 Tall Weeds

Survey X: 493790.9, Survey Y: 254184.31, Z1: 825.46, Z DEM: 825.56, Z LAS: 825.45, ΔZ DEM: 0.1, ΔZ LAS: -0.01



North



South



East



West

Point: 2036 Forested

Survey X: 493770.77, Survey Y: 254413.55, Z1: 833.03, Z DEM: 833.14, Z LAS: 833.67, ΔZ DEM: 0.11, ΔZ LAS: 0.64



North



South



East



West

Point: 2037 Forested

Survey X: 493725.23, Survey Y: 254211.87, Z1: 823.83, Z DEM: 823.88, Z LAS: 824.11, ΔZ DEM: 0.05, ΔZ LAS: 0.28



North



South



East



West

Point: 2038 Urban Area

Survey X: 480522.41, Survey Y: 239926.98, Z1: 761.84, Z DEM: 761.78, Z LAS: 761.76, ΔZ DEM: -0.06, ΔZ LAS: -0.08



North



South



East



West

Point: 2039 Bare Earth

Survey X: 480604.71, Survey Y: 240006.51, Z1: 756.86, Z DEM: 756.87, Z LAS: 756.86, ΔZ DEM: 0, ΔZ LAS: 0



North



South



East



West

Point: 2040 Forested

Survey X: 480417.11, Survey Y: 239409.28, Z1: 752.03, Z DEM: 752.48, Z LAS: 752.48, ΔZ DEM: 0.45, ΔZ LAS: 0.45



North



South



East



West

Point: 2041 Forested

Survey X: 488552.34, Survey Y: 202403.9, Z1: 766.11, Z DEM: 766.17, Z LAS: 766.19, ΔZ DEM: 0.07, ΔZ LAS: 0.08



North



South



East



West

Point: 2042 Tall Weeds

Survey X: 488346.25, Survey Y: 201060.32, Z1: 741.77, Z DEM: 741.89, Z LAS: 742.06, ΔZ DEM: 0.12, ΔZ LAS: 0.29



North



South



East



West

Point: 2043 Urban Area

Survey X: 488884.03, Survey Y: 201693.17, Z1: 741.6, Z DEM: 741.63, Z LAS: 741.64, ΔZ DEM: 0.03, ΔZ LAS: 0.04



North



South



East



West

Point: 2044 Bare Earth

Survey X: 488802.31, Survey Y: 201763.93, Z1: 743.89, Z DEM: 743.91, Z LAS: 743.9, ΔZ DEM: 0.02, ΔZ LAS: 0.02



North



South



East



West

Point: 2045 Bare Earth

Survey X: 401173.73, Survey Y: 202716.68, Z1: 817.79, Z DEM: 817.82, Z LAS: 817.87, ΔZ DEM: 0.03, ΔZ LAS: 0.09



North



South



East



West

Point: 2046 Forested

Survey X: 401871.2, Survey Y: 202952.8, Z1: 865.27, Z DEM: 865.35, Z LAS: 865.39, ΔZ DEM: 0.09, ΔZ LAS: 0.12



North



South



East



West

Point: 2047 Forested

Survey X: 402924.19, Survey Y: 202678.67, Z1: 865.21, Z DEM: 865.28, Z LAS: 865.32, ΔZ DEM: 0.07, ΔZ LAS: 0.11



North



South



East



West

Point: 2048 Urban Area

Survey X: 437940.12, Survey Y: 212717.58, Z1: 892.26, Z DEM: 892.35, Z LAS: 892.33, ΔZ DEM: 0.09, ΔZ LAS: 0.07



North



South



East



West

Point: 2049 Urban Area

Survey X: 443434.97, Survey Y: 225996.29, Z1: 829.61, Z DEM: 829.51, Z LAS: 829.52, ΔZ DEM: -0.09, ΔZ LAS: -0.08



North



South



East



West

Point: 2050 Tall Weeds

Survey X: 443491.77, Survey Y: 226025.99, Z1: 828.13, Z DEM: 828.51, Z LAS: 828.37, ΔZ DEM: 0.38, ΔZ LAS: 0.24



North



South



East



West

Point: 2051 Bare Earth

Survey X: 443414.78, Survey Y: 226515.91, Z1: 830.29, Z DEM: 830.23, Z LAS: 830.26, ΔZ DEM: -0.06, ΔZ LAS: -0.04



North



South



East



West

Point: 2052 Forested

Survey X: 443490.52, Survey Y: 226152, Z1: 824.38, Z DEM: 824.38, Z LAS: 824.6, ΔZ DEM: 0, ΔZ LAS: 0.22



North



South



East



West

Point: 2053 Forested

Survey X: 443480.29, Survey Y: 226455.21, Z1: 823.71, Z DEM: 824.01, Z LAS: 824.05, ΔZ DEM: 0.3, ΔZ LAS: 0.34



North



South



East



West

Point: 2054 Urban Area

Survey X: 400959.14, Survey Y: 246115.64, Z1: 795.97, Z DEM: 796.01, Z LAS: 795.99, ΔZ DEM: 0.04, ΔZ LAS: 0.02



North



South



East



West

Point: 2055 Bare Earth

Survey X: 401520.35, Survey Y: 246410.82, Z1: 795.75, Z DEM: 795.73, Z LAS: 795.82, ΔZ DEM: -0.02, ΔZ LAS: 0.06



North



South



East



West

Point: 2056 Forested

Survey X: 401785.48, Survey Y: 246336.51, Z1: 793.04, Z DEM: 793.03, Z LAS: 793.01, ΔZ DEM: -0.01, ΔZ LAS: -0.03



North



South



East



West

Point: 2057 Tall Weeds

Survey X: 402076.41, Survey Y: 246001.62, Z1: 790.14, Z DEM: 790.32, Z LAS: 790.37, ΔZ DEM: 0.18, ΔZ LAS: 0.23



North



South



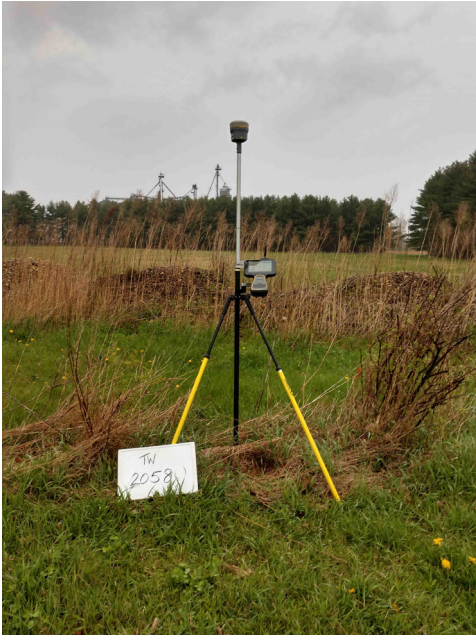
East



West

Point: 2058 Tall Weeds

Survey X: 402090.36, Survey Y: 245997.3, Z1: 790.45, Z DEM: 790.79, Z LAS: 790.54, ΔZ DEM: 0.33, ΔZ LAS: 0.08



North



South



East



West

Point: 2059 Forested

Survey X: 479581.77, Survey Y: 274384.2, Z1: 954.84, Z DEM: 954.96, Z LAS: 954.97, ΔZ DEM: 0.12, ΔZ LAS: 0.14



North



South



East



West

Point: 2060 Forested

Survey X: 479578.83, Survey Y: 274377.94, Z1: 954.71, Z DEM: 954.73, Z LAS: 954.77, ΔZ DEM: 0.02, ΔZ LAS: 0.06



North



South



East



West

Point: 2061 Bare Earth

Survey X: 479316.26, Survey Y: 273742.28, Z1: 948, Z DEM: 947.87, Z LAS: 947.94, ΔZ DEM: -0.13, ΔZ LAS: -0.06



North



South



East



West

Point: 2062 Urban Area

Survey X: 479866.16, Survey Y: 273870.87, Z1: 967.41, Z DEM: 967.41, Z LAS: 967.38, ΔZ DEM: 0, ΔZ LAS: -0.03



North



South



East



West

Point: 2063 Urban Area

Survey X: 435787.68, Survey Y: 323911.39, Z1: 903.95, Z DEM: 903.95, Z LAS: 903.88, ΔZ DEM: 0, ΔZ LAS: -0.06



North



South



East



West

Point: 2064 Forested

Survey X: 435986.85, Survey Y: 323447.07, Z1: 909.73, Z DEM: 909.89, Z LAS: 909.98, ΔZ DEM: 0.16, ΔZ LAS: 0.25



North



South



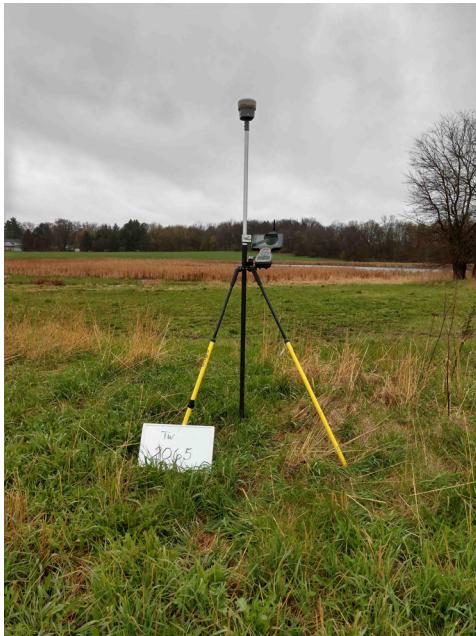
East



West

Point: 2065 Tall Weeds

Survey X: 400784.28, Survey Y: 328474.47, Z1: 960.61, Z DEM: 960.67, Z LAS: 960.52, ΔZ DEM: 0.07, ΔZ LAS: -0.09



North



South



East



West

Point: 2066 Bare Earth

Survey X: 400818.69, Survey Y: 328356.79, Z1: 961.07, Z DEM: 961.21, Z LAS: 961.25, ΔZ DEM: 0.15, ΔZ LAS: 0.19



North



South



East



West

Point: 2067 Urban Area

Survey X: 400939.2, Survey Y: 328329.93, Z1: 962.58, Z DEM: 962.71, Z LAS: 962.67, ΔZ DEM: 0.13, ΔZ LAS: 0.09



North



South



East



West

Point: 2068 Bare Earth

Survey X: 421849.96, Survey Y: 305787.06, Z1: 916.51, Z DEM: 916.32, Z LAS: 916.48, ΔZ DEM: -0.19, ΔZ LAS: -0.03



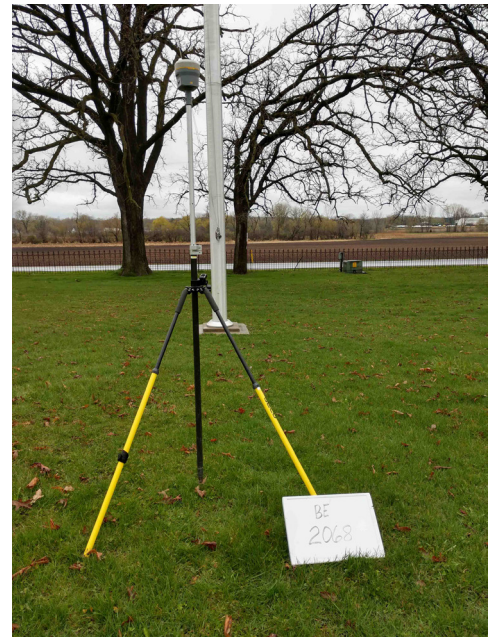
North



South



East



West

Point: 2069 Urban Area

Survey X: 422230.07, Survey Y: 305725.78, Z1: 928.32, Z DEM: 928.28, Z LAS: 928.2, ΔZ DEM: -0.04, ΔZ LAS: -0.12



North



South



East



West

Point: 2070 Forested

Survey X: 422491.96, Survey Y: 305740.1, Z1: 930.53, Z DEM: 930.56, Z LAS: 930.57, ΔZ DEM: 0.03, ΔZ LAS: 0.04



North



South



East



West

Point: 2071 Urban Area

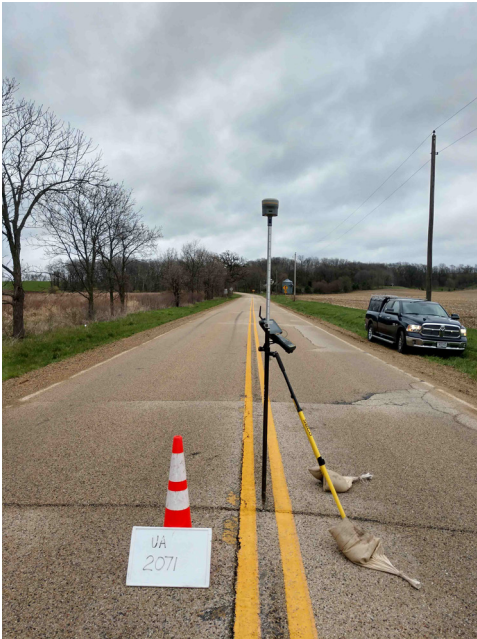
Survey X: 400874.73, Survey Y: 278612.06, Z1: 867.33, Z DEM: 867.39, Z LAS: 867.29, ΔZ DEM: 0.06, ΔZ LAS: -0.04



North



South



East



West

Point: 2072 Bare Earth

Survey X: 400641.15, Survey Y: 278550.72, Z1: 863.15, Z DEM: 863.28, Z LAS: 863.31, ΔZ DEM: 0.13, ΔZ LAS: 0.17



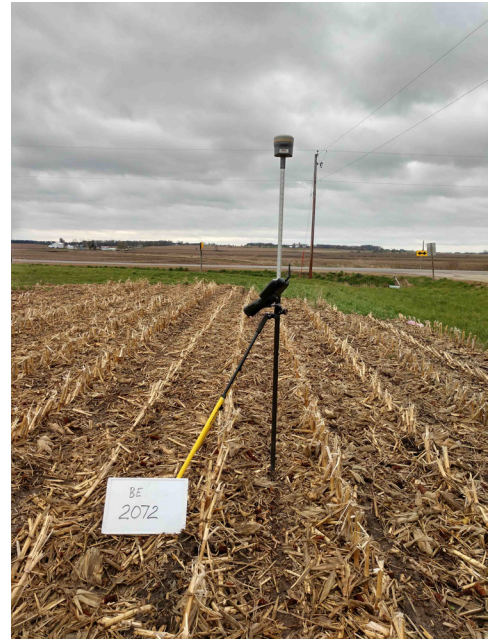
North



South



East



West

Point: 2073 Tall Weeds

Survey X: 400575.84, Survey Y: 278563.49, Z1: 861.8, Z DEM: 861.87, Z LAS: 861.9, ΔZ DEM: 0.07, ΔZ LAS: 0.1



North



South



East



West

Point: 2074 Forested

Survey X: 400579.88, Survey Y: 278727.87, Z1: 860.36, Z DEM: 860.46, Z LAS: 860.44, ΔZ DEM: 0.1, ΔZ LAS: 0.09



North



South



East



West

Point: 2075 Bare Earth

Survey X: 449553.1, Survey Y: 295022.91, Z1: 919.53, Z DEM: 919.92, Z LAS: 919.85, ΔZ DEM: 0.39, ΔZ LAS: 0.32



North



South



East



West

Point: 2076 Urban Area

Survey X: 449517.47, Survey Y: 296079.19, Z1: 946.72, Z DEM: 946.56, Z LAS: 946.51, ΔZ DEM: -0.16, ΔZ LAS: -0.21



North



South



East



West

Point: 2077 Forested

Survey X: 449592.8, Survey Y: 296116.83, Z1: 948.08, Z DEM: 947.9, Z LAS: 948.02, ΔZ DEM: -0.18, ΔZ LAS: -0.06



North



South



East



West

Point: 2078 Forested

Survey X: 449630.62, Survey Y: 296091.52, Z1: 947.81, Z DEM: 947.8, Z LAS: 947.87, ΔZ DEM: -0.01, ΔZ LAS: 0.06



North



South



East



West

Point: 2079 Urban Area

Survey X: 443369.92, Survey Y: 262551.09, Z1: 805.58, Z DEM: 805.35, Z LAS: 805.37, ΔZ DEM: -0.22, ΔZ LAS: -0.2



North



South



East



West

Point: 2080 Bare Earth

Survey X: 443364.75, Survey Y: 262124.05, Z1: 800.96, Z DEM: 801.08, Z LAS: 801.01, ΔZ DEM: 0.12, ΔZ LAS: 0.05



North



South



East



West

Point: 2081 Tall Weeds

Survey X: 443379.94, Survey Y: 262197.11, Z1: 796.76, Z DEM: 797.32, Z LAS: 797.32, ΔZ DEM: 0.56, ΔZ LAS: 0.56



North



South



East



West

Point: 2082 Forested

Survey X: 443207.56, Survey Y: 261862, Z1: 796.94, Z DEM: 797.13, Z LAS: 797.13, ΔZ DEM: 0.19, ΔZ LAS: 0.19



North



South



East



West

Point: 2083 Forested

Survey X: 443110.22, Survey Y: 262079.29, Z1: 797.34, Z DEM: 797.43, Z LAS: 797.46, ΔZ DEM: 0.09, ΔZ LAS: 0.13



North



South



East



West

Point: 2084 Urban Area

Survey X: 420774.52, Survey Y: 281246.79, Z1: 951.3, Z DEM: 951, Z LAS: 951.03, ΔZ DEM: -0.31, ΔZ LAS: -0.27



North



South



East



West

Point: 2085 Bare Earth

Survey X: 420887.16, Survey Y: 281370.79, Z1: 948.3, Z DEM: 948.3, Z LAS: 948.29, ΔZ DEM: 0, ΔZ LAS: 0



North



South



East



West

Point: 2086 Urban Area

Survey X: 420795.54, Survey Y: 281233.95, Z1: 951.89, Z DEM: 951.85, Z LAS: 951.81, ΔZ DEM: -0.05, ΔZ LAS: -0.08



North



South



East



West

Point: 2087 Bare Earth

Survey X: 420845.84, Survey Y: 281323.57, Z1: 948.72, Z DEM: 948.68, Z LAS: 948.72, ΔZ DEM: -0.04, ΔZ LAS: 0



North



South



East



West

Point: 2088 Forested

Survey X: 420909.49, Survey Y: 281516.77, Z1: 940.54, Z DEM: 940.53, Z LAS: 940.63, ΔZ DEM: -0.01, ΔZ LAS: 0.09



North



South



East



West

Point: 2089 Forested

Survey X: 420926.32, Survey Y: 281556.42, Z1: 939, Z DEM: 938.97, Z LAS: 939.06, ΔZ DEM: -0.03, ΔZ LAS: 0.06



North



South



East



West