



Region 1: Test results for Charles, Narragansett and adjoining Blackstone areas, MA

Summary

In FEMA-Region 1 the areas of Charles, Narragansett and partially Blackstone encompasses in total about 560 square miles. A LiDAR data acquisition was ordered for a 2' equivalent contour accuracy, which equals the highest specification level. The area was flown and post-processed by Photo Science. CompassData performed the quality control of the collected and processed LiDAR data with a fundamental vertical accuracy (FVA) and a consolidated vertical accuracy (CVA) assessment, respectively. The planning, data collection, data processing, and data testing were successfully accomplished by the STARR members.

Index

- Final Test Results
- FVA Test
- CVA Test
- Distribution of Testing Points
- FVA Test Details
- CVA Test Details

Final Test Results

The vertical accuracy requirements based on flood risk and terrain slope are met with 16.6 cm and 18.6 cm for both FVA and CVA testing. The mandatory requirements for the highest specification for vertical accuracy, 95% confidence level are for FVA < 24.5 cm and CVA < 36.3 cm.

FVA Test

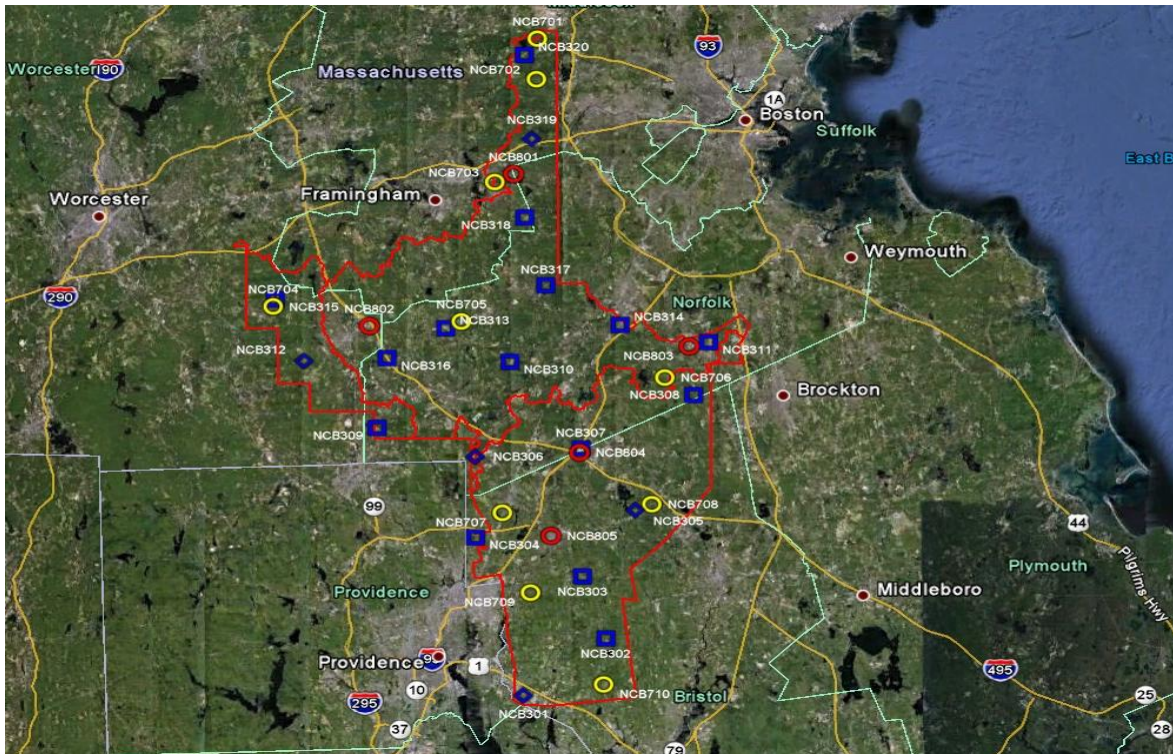
Tested 16.6 cm fundamental vertical accuracy at 95% confidence level in open terrain using $RMSE_{(Z)} \times 1.9600$. The Root Mean Square Error for the elevation differences between GPS control points and LiDAR points is 8.5 cm calculated with 20 FVA points.



CVA Test

Tested 18.6 cm consolidated vertical accuracy at 95th percentile in: open terrain, forest terrain, and urban terrain. The Root Mean Square Error for the elevation differences between GPS control points and LiDAR points is 9.4 cm calculated with 20 supplemental vertical accuracy points (SVA).

Distribution of Testing Points



Region 1, Blackstone, MA

Legend:

-  FVA points in open terrain on hard surface
-  FVA points in open terrain used as well in CVA test
-  SVA points in open terrain
-  SVA points in urban terrain
-  SVA points in forest terrain



According to the area to be tested the 20 FVA points are evenly distributed. Additional 20 SVA points are distributed in respect to the available major land classes.

FVA Test Details

FVA-Points	Date	Northing (GPS)	Easting (GPS)	MSL (GPS)	MSL (LiDAR)	ΔZ
NCB301	10/17/2010	4628494.838	307533.374	10.029	10.00	0.03
NCB302	10/17/2010	4634605.935	315513.463	34.915	34.84	0.07
NCB303	10/17/2010	4641539.998	313490.146	44.364	44.31	0.05
NCB304	10/17/2010	303502.475	4646143.418	36.592	36.58	0.01
NCB305	10/17/2010	4648736.941	318721.900	31.321	31.36	-0.04
NCB306	10/17/2010	303764.026	4655080.966	104.193	104.13	0.06
NCB307	10/17/2010	4655700.389	313765.162	65.519	65.44	0.08
NCB308	10/17/2010	4661311.798	324586.148	70.294	70.28	0.01
NCB309	10/15/2010	294547.718	4658540.495	92.074	92.13	-0.06
NCB310	10/17/2010	4665489.855	307320.864	75.617	75.54	0.08
NCB311	10/15/2010	4667120.100	326162.869	71.197	71.12	0.08
NCB312	10/15/2010	287856.380	4666140.866	152.275	152.33	-0.06
NCB313	10/17/2010	4669381.293	301359.001	62.492	62.54	-0.05
NCB314	10/16/2010	4669278.445	317849.221	40.964	40.91	0.05
NCB315	10/15/2010	4675576.809	298445.293	97.177	97.31	-0.13
NCB316	10/15/2010	4666242.506	295717.649	69.524	69.35	0.17
NCB317	10/17/2010	4673867.749	310950.283	69.647	69.53	0.12
NCB318	10/17/2010	4681441.377	309177.060	56.169	56.31	-0.14
NCB319	10/17/2010	4690139.969	310102.157	62.979	63.09	-0.11
NCB320	10/16/2010	4699469.255	309660.020	66.862	66.93	-0.07

Z Mean	0.07	RMSE:	0.085
Z Min:	-0.14	* 1.9600	0.166
Z Max:	0.17		

UTM Zone 19 North, NAD83, NAVD88

MSL = NAVD88/Geoid09

All units in meters

Note:

All 20 of the FVA points (open terrain) passed. 100% of the points are within the 24.5 cm confidence level. The FVA test is passed.



CVA Test Details

CVAs	Typ	Date	Northing (GPS)	Easting (GPS)	MSL (GPS)	MSL (LiDAR)	Δ Z
NCB301	O	10/17/2010	4628494.838	307533.374	10.029	10.00	0.03
NCB305	O	10/17/2010	4648736.941	318721.900	31.321	31.35	-0.03
NCB306	O	10/17/2010	4655080.966	303764.026	104.193	104.13	0.06
NCB312	O	10/15/2010	4666140.866	287856.380	152.275	152.35	-0.08
NCB319	O	10/17/2010	4690139.969	310102.157	62.979	63.10	-0.12
NCB701	F	11/21/2010	4701210.743	310945.898	83.864	84.05	-0.19
NCB702	F	11/21/2010	4696716.338	310730.807	41.222	41.41	-0.19
NCB703	F	11/21/2010	4685420.328	306465.675	66.446	66.49	-0.04
NCB704	F	11/21/2010	4672245.549	285112.761	87.663	87.72	-0.06
NCB705	F	11/21/2010	4670062.450	302862.852	42.068	42.05	0.02
NCB706	F	11/21/2010	4663291.743	321927.411	93.695	93.75	-0.06
NCB707	F	11/21/2010	4648766.875	306139.995	60.485	60.45	0.03
NCB708	F	11/21/2010	4649309.082	320298.206	24.906	25.03	-0.12
NCB709	F	11/21/2010	4639847.906	308544.841	34.154	34.29	-0.14
NCB710	F	11/21/2010	4629478.233	315161.002	30.520	30.62	-0.10
NCB801	U	11/21/2010	4686251.323	308267.450	38.909	38.90	0.01
NCB802	U	11/21/2010	4669813.904	294164.121	83.204	83.32	-0.12
NCB803	U	11/21/2010	4666682.629	324338.796	56.482	56.53	-0.05
NCB804	U	11/21/2010	4655225.613	313637.080	59.767	59.70	0.07
NCB805	U	11/21/2010	4646074.360	310663.867	38.840	38.76	0.08

Z Mean	-0.11	RMSE:	0.094
Z Min:	-0.19	* 1.9600	0.184
Z Max:	0.08	95-Percentile	0.186

Land Class Types: O = Open, F = Forest, U = Urban

UTM Zone 19 North, NAD83, NAVD88

MSL = NAVD88/Geoid09

All units in meters

Note:

All 20 of the SVA points (open, forest, and urban terrain) passed. 100% of the points are within the 36.3 cm confidence level. The CVA test is passed.

