

LIDAR Accuracy Assessment Report Alamance County

Alamance County, Cape Fear Basin

The preliminary checkpoint spreadsheets were received from NCGS on June 12, 2002. Two spreadsheets were included which compared the independent QA/QC survey checkpoints with the interpolated LIDAR "Z" value as provided by the contractors. The spreadsheet summaries included:

1. All the checkpoints with the RMSE calculation for combined land cover
2. 95% of the checkpoints with the RMSE calculation (5% of points having the largest error removed)

All data was reviewed and further analyzed to assess the quality of the data. The review process examined the statistics for the combined land cover and the trends for each specific land cover type. The following graphs and figures illustrate the data quality as per the RMSE criteria.

Table 1 summarizes the RMSE using:

- 100% of the checkpoints
- 95% of the checkpoints
- Checkpoints categorized by land cover type

Table 1. RMSE by Land Class				
%	RMSE (cm)	# of Points	Land Class	RMSE Criteria (cm)
100	21.8	120	All	
95	17.2	114	All	25
19	19.4	23	Grass	
20	17.2	24	Weeds/Crop	
15	19.0	18	Scrub	
33	14.8	39	Forest	
8	17.1	10	Built-up	

The LIDAR data for Alamance County, Cape Fear Basin meets the specification as per the RMSE criteria of 25 cm.

All figures represent the data with the 95% data set. The data is of good quality.

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Figure 1 illustrates the RMSE by specific land cover type.

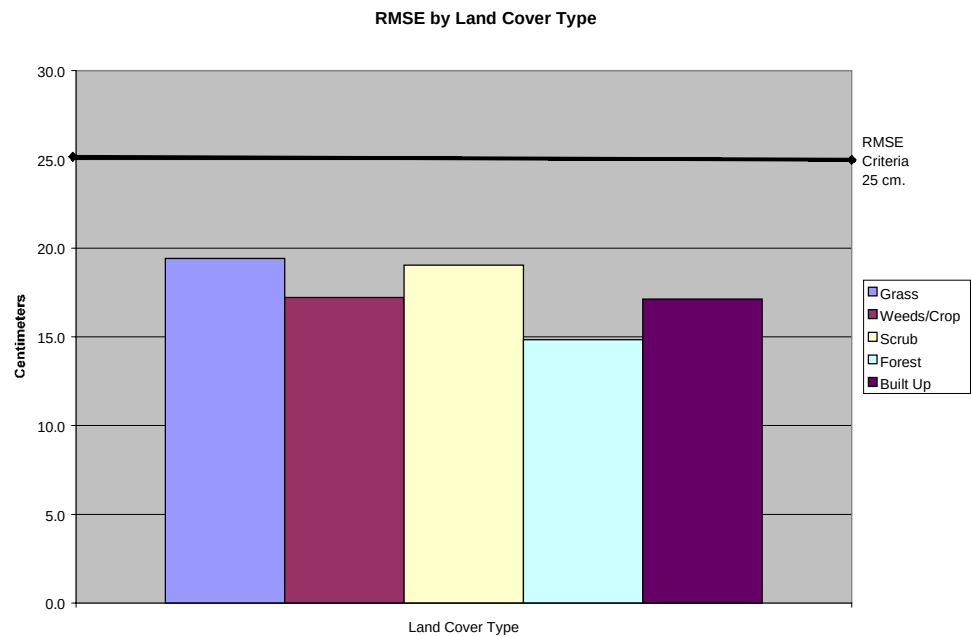


Figure 1

Figure 2 illustrates the magnitude of the differences between the checkpoints and LIDAR data by specific land cover type and sorted from lowest to highest.

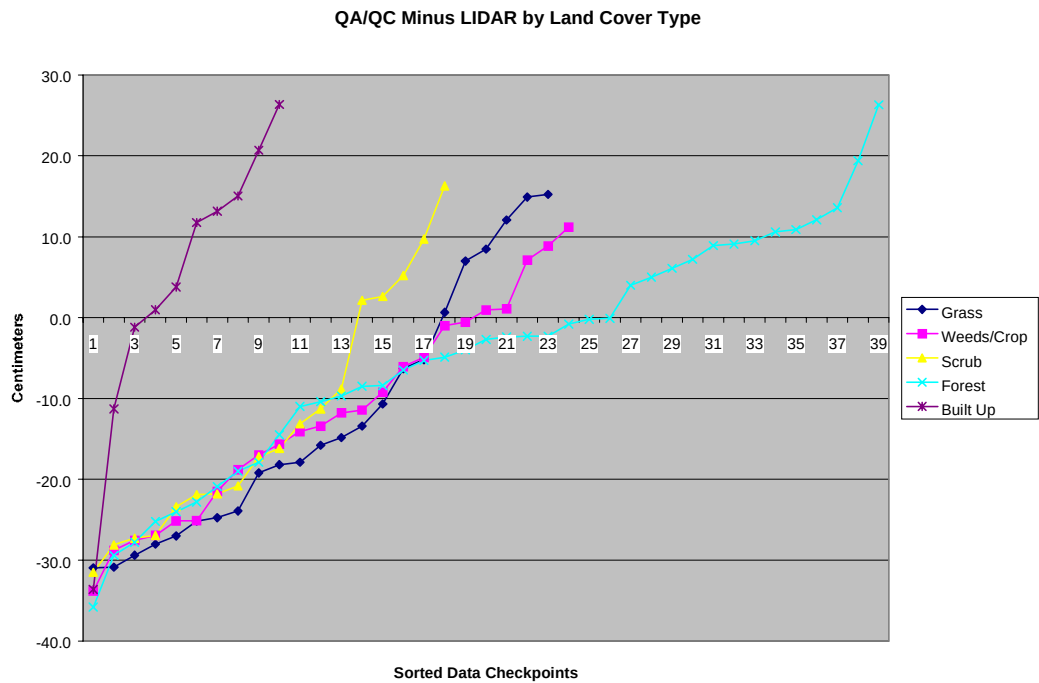


Figure 2

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Table 2 illustrates the Delta between the QA/QC survey checkpoints and that of the interpolated LIDAR.

Table 2. Elevation Delta					
Delta (cm)	Land Cover				
-31.0	Grass	-6.1	Weeds/Crop	-8.5	Forest
-30.9	Grass	-4.9	Weeds/Crop	-8.4	Forest
-29.4	Grass	-1.0	Weeds/Crop	-6.5	Forest
-28.0	Grass	-0.6	Weeds/Crop	-5.3	Forest
-27.0	Grass	1.0	Weeds/Crop	-4.9	Forest
-25.1	Grass	1.1	Weeds/Crop	-4.0	Forest
-24.7	Grass	7.1	Weeds/Crop	-2.7	Forest
-23.9	Grass	8.9	Weeds/Crop	-2.4	Forest
-19.2	Grass	11.2	Weeds/Crop	-2.3	Forest
-18.2	Grass	-31.5	Scrub	-2.3	Forest
-17.9	Grass	-28.1	Scrub	-0.8	Forest
-15.8	Grass	-27.3	Scrub	-0.2	Forest
-14.9	Grass	-26.9	Scrub	-0.1	Forest
-13.4	Grass	-23.4	Scrub	4.0	Forest
-10.7	Grass	-21.9	Scrub	5.0	Forest
-6.3	Grass	-21.8	Scrub	6.1	Forest
-5.2	Grass	-20.8	Scrub	7.2	Forest
0.6	Grass	-17.2	Scrub	8.9	Forest
7.0	Grass	-16.2	Scrub	9.1	Forest
8.5	Grass	-13.1	Scrub	9.5	Forest
12.1	Grass	-11.3	Scrub	10.6	Forest
14.9	Grass	-8.8	Scrub	10.9	Forest
15.2	Grass	2.2	Scrub	12.1	Forest
-33.8	Weeds/Crop	2.6	Scrub	13.6	Forest
-28.8	Weeds/Crop	5.2	Scrub	19.4	Forest
-27.6	Weeds/Crop	9.7	Scrub	26.3	Forest
-26.9	Weeds/Crop	16.3	Scrub	-33.6	Built-up
-25.1	Weeds/Crop	-35.8	Forest	-11.3	Built-up
-25.1	Weeds/Crop	-29.4	Forest	-1.2	Built-up
-21.5	Weeds/Crop	-27.8	Forest	1.0	Built-up
-18.8	Weeds/Crop	-25.2	Forest	3.8	Built-up
-17.0	Weeds/Crop	-24.0	Forest	11.8	Built-up
-15.6	Weeds/Crop	-22.8	Forest	13.2	Built-up
-14.1	Weeds/Crop	-20.9	Forest	15.0	Built-up
-13.4	Weeds/Crop	-19.0	Forest	20.7	Built-up
-11.8	Weeds/Crop	-17.9	Forest	26.4	Built-up
-11.4	Weeds/Crop	-14.5	Forest		
-9.2	Weeds/Crop	-11.0	Forest		
		-10.4	Forest		
		-9.7	Forest		

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Table 3 illustrates the overall statistics for the checkpoint data.

Table 3. Overall Descriptive Statistics								
	RMSE (cm)	Mean (cm)	Median (cm)	Skew (cm)	Std Dev (cm)	# of Points	Min (cm)	Max (cm)
Total	17.2	-8.1	-9.0	0.2	15.3	114	-35.8	26.4
Grass	19.4	-12.3	-15.8	0.6	15.4	23	-31.0	15.2
Weeds/Crop	17.2	-11.8	-12.6	0.1	12.8	24	-33.8	11.2
Scrub	19.0	-12.9	-16.7	0.7	14.4	18	-31.5	16.3
Forest	14.8	-4.5	-2.7	-0.2	14.3	39	-35.8	26.3
Built Up	17.1	4.6	7.8	-1.1	17.4	10	-33.6	26.4

Figure 3 illustrates a histogram of the associated delta errors between the data checkpoints and the interpolated TIN values.

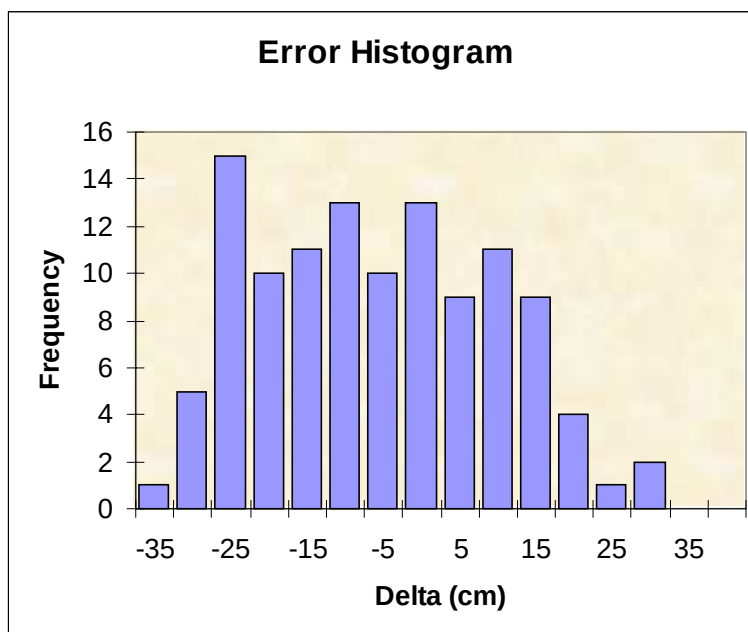


Figure 3