

LIDAR Accuracy Assessment Report—Chatham County

Chatham County, Cape Fear Basin

The preliminary checkpoint spreadsheets were received from NCGS on May 30, 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	27.4	124	All	
95	22.1	118	All	25
17	16.0	21	Grass	
17	22.4	21	Weeds/Crop	
15	21.6	19	Scrub	
31	22.2	39	Forest	
15	27.3	18	Built-up	

The LIDAR data for Chatham 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 satisfactory quality.

LIDAR Accuracy Assessment Report—Chatham County

Figure 1 illustrates the RMSE by specific land cover type.

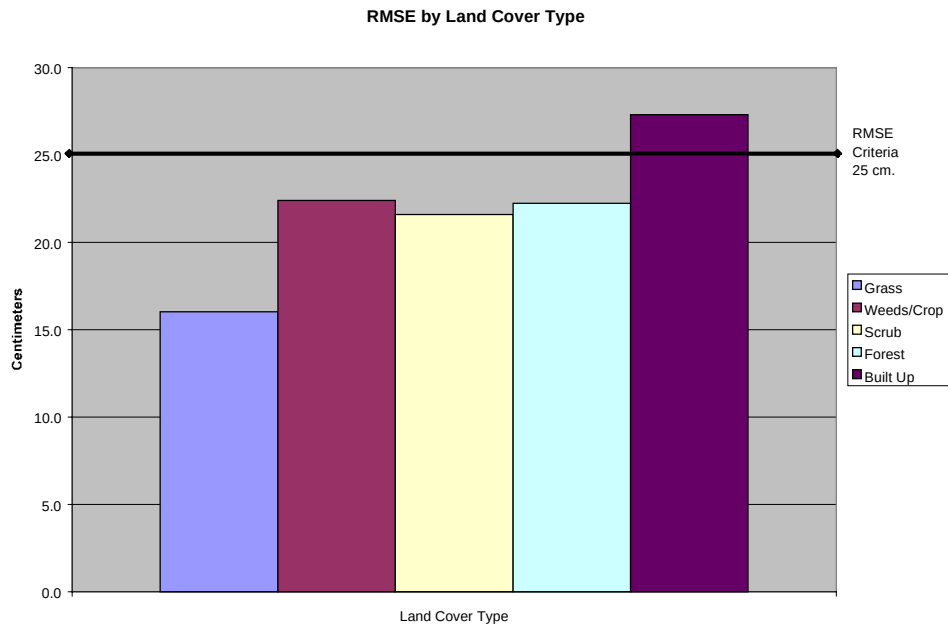


Figure 1

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.

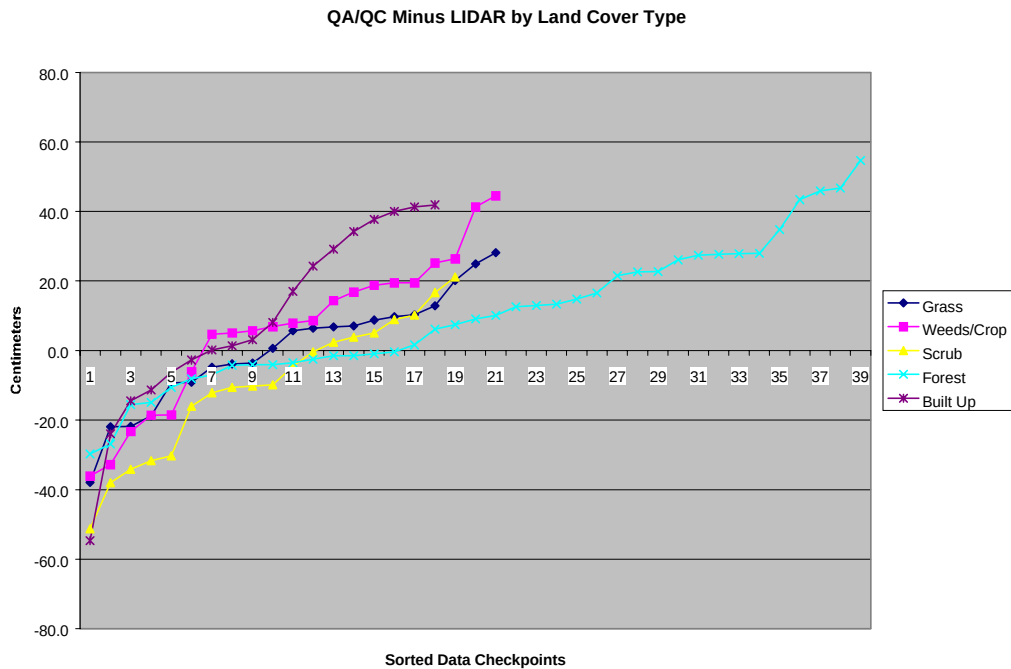


Figure 2

LIDAR Accuracy Assessment Report—Chatham County

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				
-37.9	Grass	26.4	Weeds/Crop	9.1	Forest
-21.9	Grass	41.3	Weeds/Crop	10.1	Forest
-21.8	Grass	44.5	Weeds/Crop	12.6	Forest
-18.8	Grass	-51.3	Scrub	13.0	Forest
-9.3	Grass	-38.0	Scrub	13.3	Forest
-9.1	Grass	-34.1	Scrub	14.8	Forest
-4.8	Grass	-31.6	Scrub	16.6	Forest
-3.8	Grass	-30.3	Scrub	21.5	Forest
-3.6	Grass	-16.0	Scrub	22.6	Forest
0.6	Grass	-12.1	Scrub	22.7	Forest
5.7	Grass	-10.6	Scrub	26.1	Forest
6.4	Grass	-10.2	Scrub	27.4	Forest
6.8	Grass	-9.9	Scrub	27.7	Forest
7.1	Grass	-4.5	Scrub	27.9	Forest
8.8	Grass	-0.4	Scrub	28.0	Forest
9.8	Grass	2.4	Scrub	34.8	Forest
10.3	Grass	3.9	Scrub	43.4	Forest
12.9	Grass	5.1	Scrub	45.9	Forest
20.1	Grass	8.9	Scrub	46.7	Forest
24.9	Grass	10.2	Scrub	54.7	Forest
28.2	Grass	16.7	Scrub	-54.7	Built-up
-36.1	Weeds/Crop	21.2	Scrub	-23.9	Built-up
-32.8	Weeds/Crop	-29.7	Forest	-14.5	Built-up
-23.3	Weeds/Crop	-26.9	Forest	-11.3	Built-up
-18.6	Weeds/Crop	-15.6	Forest	-6.3	Built-up
-18.5	Weeds/Crop	-14.9	Forest	-2.7	Built-up
-6.1	Weeds/Crop	-10.6	Forest	0.2	Built-up
4.7	Weeds/Crop	-8.1	Forest	1.4	Built-up
5.1	Weeds/Crop	-7.0	Forest	3.1	Built-up
5.7	Weeds/Crop	-4.2	Forest	8.1	Built-up
6.9	Weeds/Crop	-4.1	Forest	17.0	Built-up
7.9	Weeds/Crop	-4.1	Forest	24.3	Built-up
8.6	Weeds/Crop	-3.5	Forest	29.2	Built-up
14.4	Weeds/Crop	-2.5	Forest	34.2	Built-up
16.8	Weeds/Crop	-1.5	Forest	37.7	Built-up
18.8	Weeds/Crop	-1.5	Forest	40.0	Built-up
19.5	Weeds/Crop	-0.9	Forest	41.3	Built-up
19.5	Weeds/Crop	-0.4	Forest	41.9	Built-up
25.2	Weeds/Crop	1.6	Forest		
		6.2	Forest		
		7.4	Forest		

LIDAR Accuracy Assessment Report—Chatham County

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	22.1	4.4	5.4	-0.2	21.7	118	-54.7	54.7
Grass	16.0	0.5	5.7	-0.5	16.4	21	-37.9	28.2
Weeds/Crop	22.4	6.2	7.9	-0.4	22.1	21	-36.1	44.5
Scrub	21.6	-9.5	-9.9	-0.5	19.9	19	-51.3	21.2
Forest	22.2	10.2	9.1	0.3	20.0	39	-29.7	54.7
Built Up	27.3	9.2	5.6	-0.6	26.5	18	-54.7	41.9

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

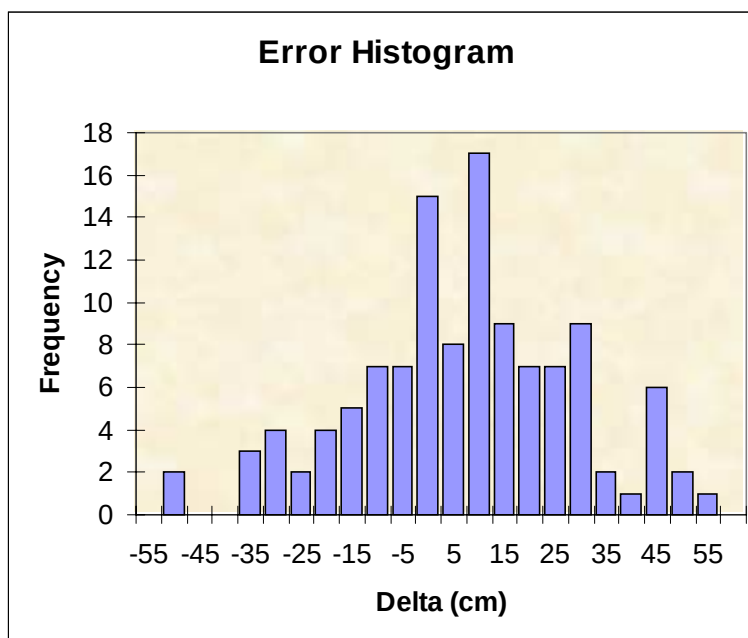


Figure 3