

LIDAR Accuracy Assessment Report—Lenoir County

Lenoir County - Neuse Basin

The preliminary checkpoint spreadsheets were received from NCGS on November 20, 2001. 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	22.3	120	All	
95	17.5	114	All	25
17	15.1	20	Grass	
17	15.7	20	Weeds/Crop	
14	21.5	17	Scrub	
31	19.4	37	Forest	
17	13.8	20	Built-up	

The LIDAR data for Lenoir County, Neuse 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.

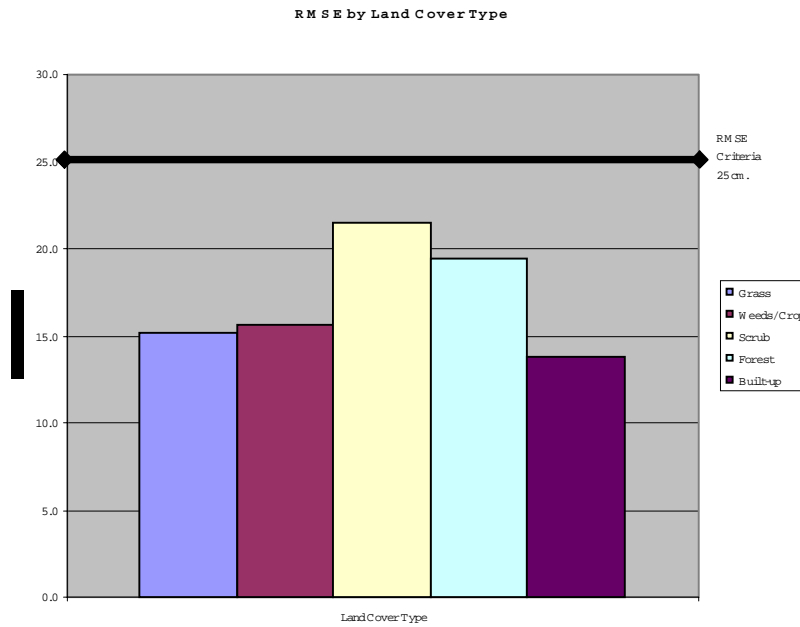


Figure 1

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.

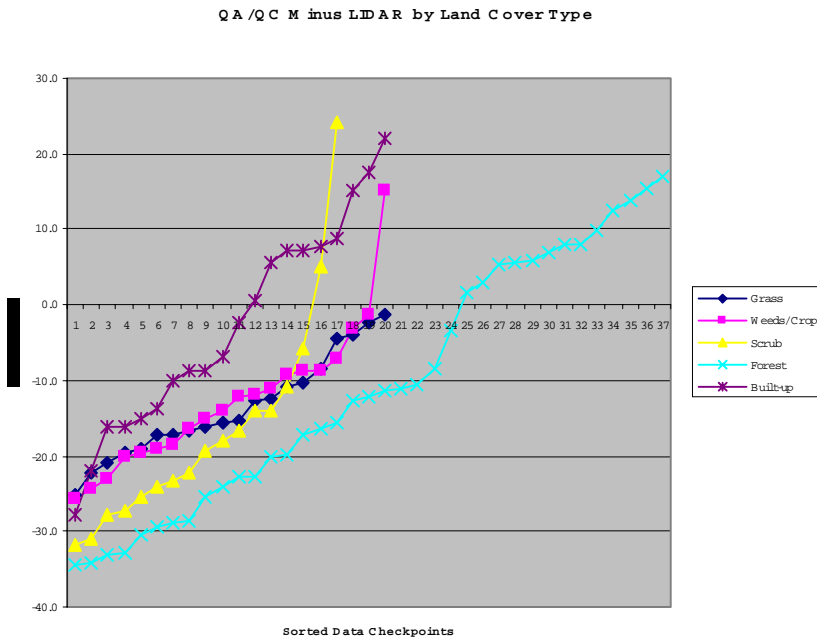


Figure 2

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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				
-25.1	Grass	-1.4	Weeds/Crop	-10.7	Forest
-22.2	Grass	15.1	Weeds/Crop	-8.3	Forest
-21.0	Grass	-31.8	Scrub	-3.4	Forest
-19.5	Grass	-30.9	Scrub	1.8	Forest
-19.1	Grass	-27.8	Scrub	2.9	Forest
-17.3	Grass	-27.2	Scrub	5.2	Forest
-17.2	Grass	-25.3	Scrub	5.7	Forest
-16.6	Grass	-24.1	Scrub	5.8	Forest
-16.0	Grass	-23.3	Scrub	7.0	Forest
-15.7	Grass	-22.4	Scrub	7.9	Forest
-15.3	Grass	-19.3	Scrub	7.9	Forest
-12.6	Grass	-17.9	Scrub	9.9	Forest
-12.4	Grass	-16.7	Scrub	12.4	Forest
-10.8	Grass	-14.1	Scrub	13.9	Forest
-10.3	Grass	-13.9	Scrub	15.5	Forest
-8.4	Grass	-10.8	Scrub	17.1	Forest
-4.6	Grass	-5.8	Scrub	-27.7	Built-up
-4.0	Grass	5.2	Scrub	-22.0	Built-up
-2.4	Grass	24.1	Scrub	-16.2	Built-up
-1.4	Grass	-34.4	Forest	-16.1	Built-up
-25.8	Weeds/Crop	-34.1	Forest	-15.0	Built-up
-24.3	Weeds/Crop	-33.1	Forest	-13.8	Built-up
-23.0	Weeds/Crop	-32.9	Forest	-9.9	Built-up
-20.1	Weeds/Crop	-30.5	Forest	-8.8	Built-up
-19.7	Weeds/Crop	-29.4	Forest	-8.8	Built-up
-19.0	Weeds/Crop	-29.0	Forest	-6.9	Built-up
-18.5	Weeds/Crop	-28.6	Forest	-2.3	Built-up
-16.5	Weeds/Crop	-25.5	Forest	0.6	Built-up
-15.0	Weeds/Crop	-24.1	Forest	5.7	Built-up
-14.1	Weeds/Crop	-22.8	Forest	7.1	Built-up
-12.2	Weeds/Crop	-22.7	Forest	7.2	Built-up
-12.0	Weeds/Crop	-20.1	Forest	7.6	Built-up
-11.1	Weeds/Crop	-19.9	Forest	8.7	Built-up
-9.2	Weeds/Crop	-17.2	Forest	15.3	Built-up
-8.8	Weeds/Crop	-16.5	Forest	17.6	Built-up
-8.7	Weeds/Crop	-15.5	Forest	22.2	Built-up
-7.1	Weeds/Crop	-12.7	Forest		
-3.1	Weeds/Crop	-12.1	Forest		
		-11.5	Forest		
		-11.2	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	Std Dev (cm)	# of Points	Min (cm)	Max (cm)
Total	17.5	-11.0	-13.3	0.6	13.7	114	-34.4	24.1
Grass	15.1	-13.6	-15.5	0.4	6.8	20	-25.1	-1.4
Weeds/Crop	15.7	-12.7	-13.2	1.3	9.4	20	-25.8	15.1
Scrub	21.5	-16.6	-19.3	1.7	14.1	17	-31.8	24.1
Forest	19.4	-10.6	-12.1	0.2	16.4	37	-34.4	17.1
Built-up	13.8	-2.8	-4.6	0.1	13.9	20	-27.7	22.2

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

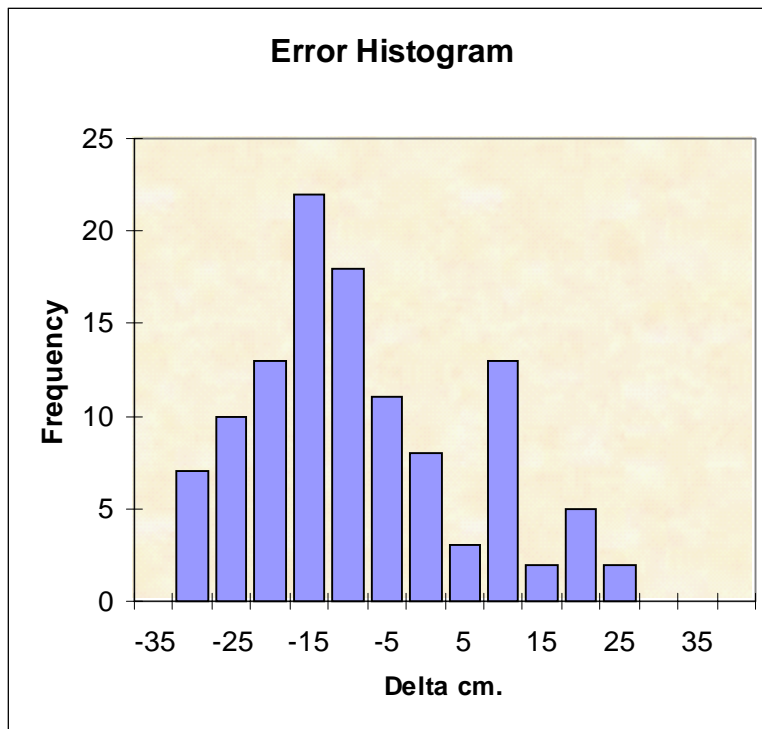


Figure 3