Guilford County, Cape Fear Basin

The preliminary checkpoint spreadsheets were received from NCGS on June 21, 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
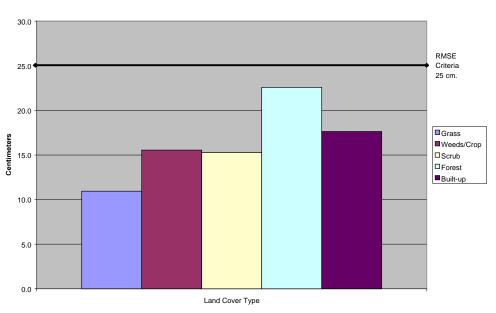- Checkpoints categorized by land cover type

Table 1. RMSE by Land Class				
%	RMSE (cm)	# of Points	Land Class	RMSE Criteria (cm)
100	27.7	120	All	
95	**17.9**	**114**	**All**	**25**
17	10.9	20	Grass	
18	15.6	21	Weeds/Crop	
14	15.3	17	Scrub	
31	22.6	38	Forest	
15	17.6	18	Built-up	

The LIDAR data for Lee County, Cape Fear Basin <u>meets the specification</u> as per the RMSE criteria of 25 cm.

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

Figure 1 illustrates the RMSE by specific land cover type.

RMSE by 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.
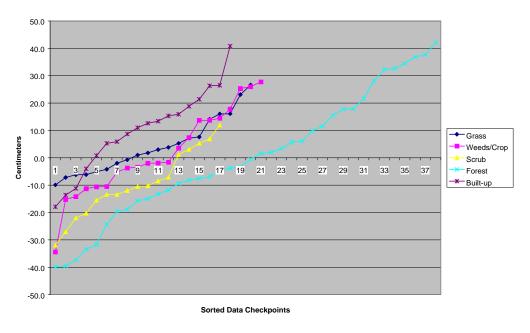
QA/QC Minus LIDAR by Land Cover Type

Figure 2

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	25.3	Weeds/Crop	1.6	Forest
-9.9	Grass	26.0	Weeds/Crop	2.0	Forest
-7.2	Grass	27.7	Weeds/Crop	3.4	Forest
-6.2	Grass	-31.9	Scrub	5.7	Forest
-6.1	Grass	-27.1	Scrub	6.1	Forest
-5.1	Grass	-22.0	Scrub	9.8	Forest
-4.2	Grass	-20.3	Scrub	11.6	Forest
-2.0	Grass	-15.5	Scrub	15.5	Forest
-0.7	Grass	-13.4	Scrub	17.8	Forest
1.0	Grass	-13.4	Scrub	17.9	Forest
1.8	Grass	-12.0	Scrub	21.6	Forest
3.0	Grass	-10.5	Scrub	28.1	Forest
3.8	Grass	-10.2	Scrub	32.3	Forest
5.3	Grass	-8.5	Scrub	32.6	Forest
7.2	Grass	-7.1	Scrub	34.5	Forest
7.6	Grass	1.2	Scrub	36.8	Forest
14.1	Grass	3.1	Scrub	37.7	Forest
16.0	Grass	5.3	Scrub	42.1	Forest
16.1	Grass	6.9	Scrub	-17.9	Built-up
23.1	Grass	12.0	Scrub	-13.6	Built-up
26.6	Grass	-39.8	Forest	-11.2	Built-up
-34.4	Weeds/Crop	-39.5	Forest	-4.0	Built-up
-15.2	Weeds/Crop	-37.3	Forest	0.8	Built-up
-14.2	Weeds/Crop	-33.4	Forest	5.3	Built-up
-11.3	Weeds/Crop	-31.8	Forest	5.9	Built-up
-10.6	Weeds/Crop	-24.3	Forest	8.7	Built-up
-10.5	Weeds/Crop	-19.6	Forest	11.0	Built-up
-5.2	Weeds/Crop	-18.8	Forest	12.6	Built-up
-3.7	Weeds/Crop	-15.7	Forest	13.4	Built-up
-3.4	Weeds/Crop	-15.0	Forest	15.3	Built-up
-2.0	Weeds/Crop	-13.2	Forest	15.9	Built-up
-1.9	Weeds/Crop	-11.8	Forest	18.8	Built-up
-1.6	Weeds/Crop	-9.3	Forest	21.4	Built-up
3.5	Weeds/Crop	-8.2	Forest	26.3	Built-up
7.4	Weeds/Crop	-7.6	Forest	26.5	Built-up
13.7	Weeds/Crop	-6.9	Forest	40.8	Built-up
13.7	Weeds/Crop	-4.8	Forest		
14.5	Weeds/Crop	-3.8	Forest		
17.8	Weeds/Crop	-3.3	Forest		
		-0.6	Forest		

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	**17.9**	1.3	0.9	0.0	17.9	114	-39.8	42.1
Grass	**10.9**	4.2	2.4	0.7	10.4	20	-9.9	26.6
Weeds/Crop	**15.6**	1.7	-1.9	-0.1	15.8	21	-34.4	27.7
Scrub	**15.3**	-9.6	-10.5	0.1	12.2	17	-31.9	12.0
Forest	**22.6**	0.3	-2.0	0.1	22.9	38	-39.8	42.1
Built Up	**17.6**	9.8	11.8	-0.1	15.1	18	-17.9	40.8

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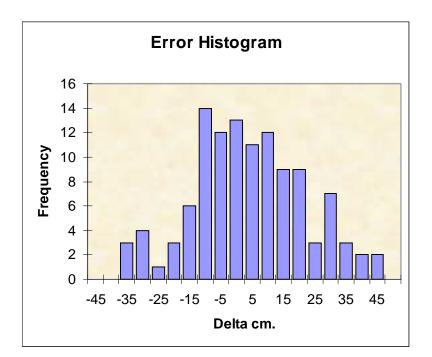

Figure 3