Lee County, Cape Fear Basin

The preliminary checkpoint spreadsheets were received from NCGS on June 21, 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	23.5	128	All	
95	**17.8**	**122**	**All**	**25**
16	17.9	20	Grass	
19	20.5	25	Weeds/Crop	
16	12.2	21	Scrub	
30	19.4	37	Forest	
15	15.2	19	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.
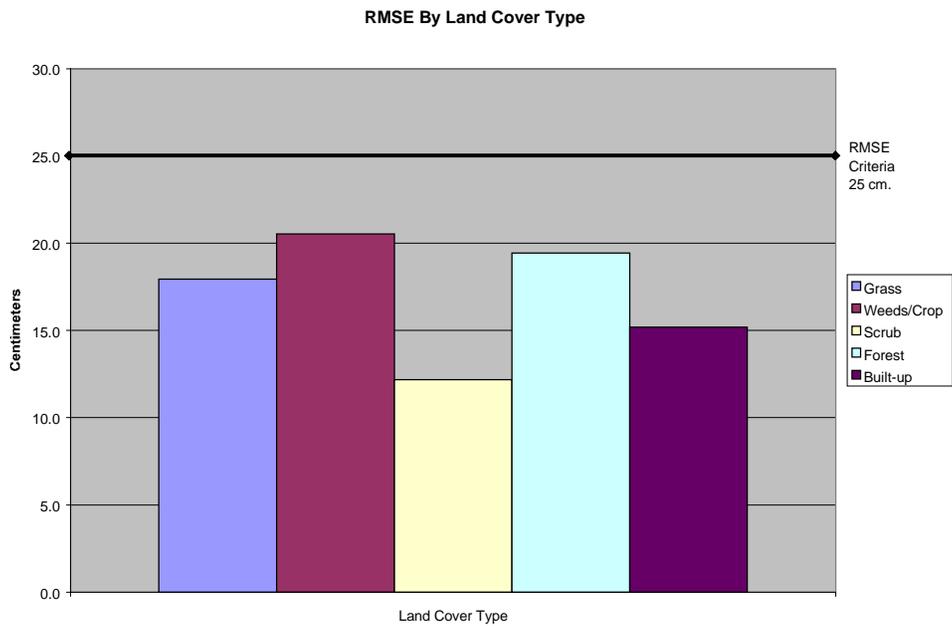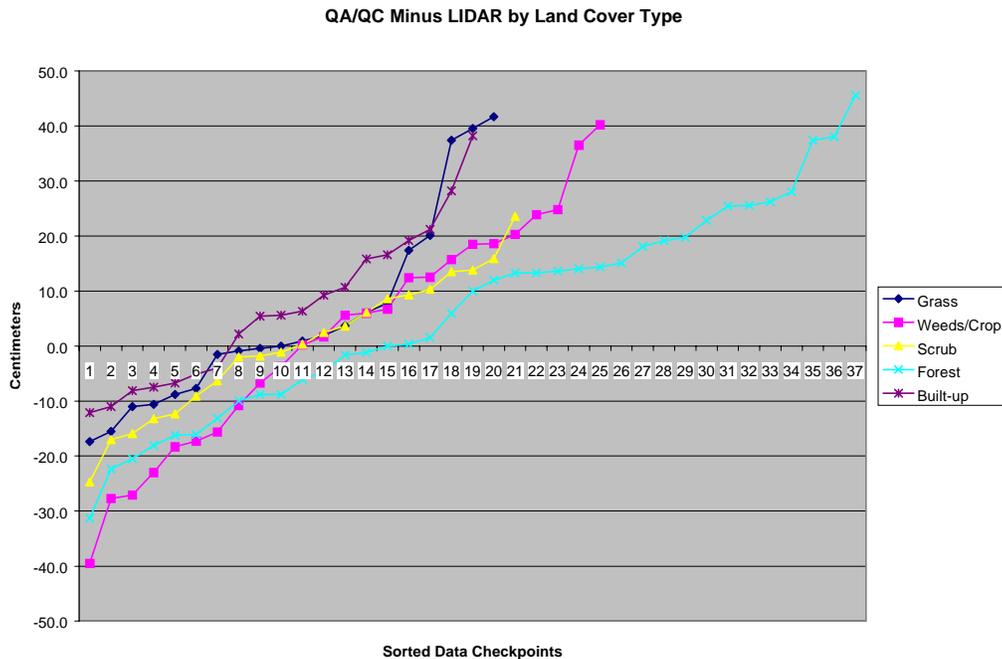
RMSE By Land Cover Type

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	Land Cover		Delta	Land Cover
Delta (cm)	**Land Cover**		20.3	Weeds/Crop		1.6	Forest
-17.4	Grass		23.9	Weeds/Crop		5.9	Forest
-15.5	Grass		24.8	Weeds/Crop		10.0	Forest
-11.0	Grass		36.5	Weeds/Crop		12.0	Forest
-10.6	Grass		40.2	Weeds/Crop		13.3	Forest
-8.8	Grass		-24.7	Scrub		13.3	Forest
-7.7	Grass		-17.0	Scrub		13.6	Forest
-1.5	Grass		-15.9	Scrub		14.0	Forest
-0.9	Grass		-13.2	Scrub		14.4	Forest
-0.4	Grass		-12.3	Scrub		15.1	Forest
0.0	Grass		-9.1	Scrub		18.1	Forest
0.9	Grass		-6.3	Scrub		19.1	Forest
1.9	Grass		-2.0	Scrub		19.7	Forest
3.7	Grass		-1.8	Scrub		22.8	Forest
6.1	Grass		-1.1	Scrub		25.4	Forest
7.8	Grass		0.3	Scrub		25.6	Forest
17.4	Grass		2.5	Scrub		26.2	Forest
20.1	Grass		3.6	Scrub		28.0	Forest
37.4	Grass		6.1	Scrub		37.4	Forest
39.5	Grass		8.6	Scrub		38.0	Forest
41.7	Grass		9.3	Scrub		45.6	Forest
-39.5	Weeds/Crop		10.3	Scrub		-12.1	Built-up
-27.7	Weeds/Crop		13.5	Scrub		-11.0	Built-up
-27.1	Weeds/Crop		13.8	Scrub		-8.1	Built-up
-23.0	Weeds/Crop		15.9	Scrub		-7.5	Built-up
-18.3	Weeds/Crop		23.6	Scrub		-6.7	Built-up
-17.3	Weeds/Crop		-31.3	Forest		-5.1	Built-up
-15.6	Weeds/Crop		-22.3	Forest		-4.0	Built-up
-10.8	Weeds/Crop		-20.5	Forest		2.2	Built-up
-6.7	Weeds/Crop		-18.1	Forest		5.4	Built-up
-3.7	Weeds/Crop		-16.2	Forest		5.6	Built-up
0.2	Weeds/Crop		-16.1	Forest		6.3	Built-up
1.7	Weeds/Crop		-13.2	Forest		9.2	Built-up
5.6	Weeds/Crop		-10.0	Forest		10.7	Built-up
6.0	Weeds/Crop		-8.8	Forest		15.8	Built-up
6.7	Weeds/Crop		-8.8	Forest		16.6	Built-up
12.4	Weeds/Crop		-6.1	Forest		19.2	Built-up
12.5	Weeds/Crop		-4.7	Forest		21.2	Built-up
15.7	Weeds/Crop		-1.6	Forest		28.2	Built-up
18.5	Weeds/Crop		-1.2	Forest		38.2	Built-up
18.6	Weeds/Crop		0.0	Forest			
			0.3	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	17.8	4.3	3.1	0.2	17.3	122	-39.5	45.6
Grass	17.9	5.1	0.5	1.0	17.6	20	-17.4	41.7
Weeds/Crop	20.5	2.2	5.6	-0.1	20.9	25	-39.5	40.2
Scrub	12.2	0.2	0.3	-0.2	12.5	21	-24.7	23.6
Forest	19.4	6.5	10.0	0.0	18.6	37	-31.3	45.6
Built Up	15.2	6.5	5.6	0.6	14.1	19	-12.1	38.2

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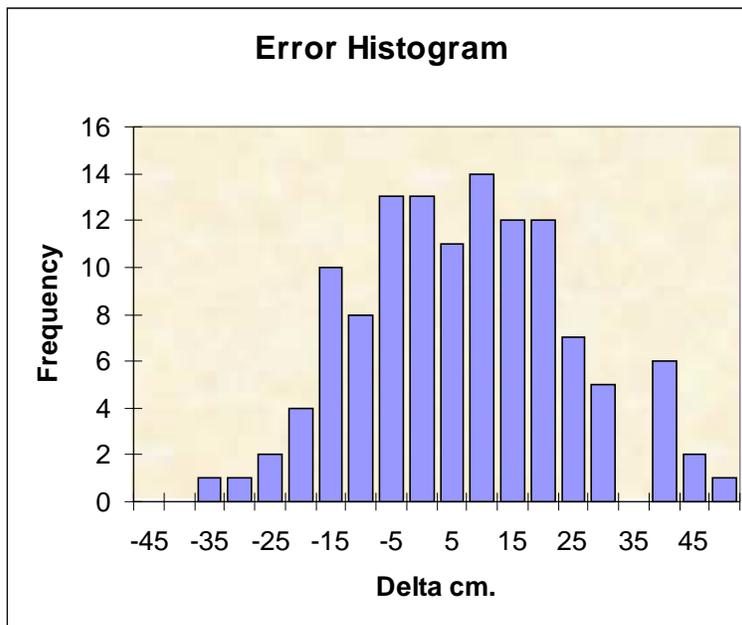

Figure 3