Brunswick County, Cape Fear Basin

The preliminary checkpoint spreadsheets were received from NCGS on November 7, 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	15.4	52	All	
95	**12.4**	**49**	**All**	**20**
23	12.5	12	Grass	
15	14.4	8	Weeds/Crop	
6	7.8	3	Scrub	
35	12.1	18	Forest	
15	11.7	8	Built-up	

The LIDAR data for Brunswick County, Caper Fear Basin <u>meets the specification</u> as per the RMSE criteria of 20 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.

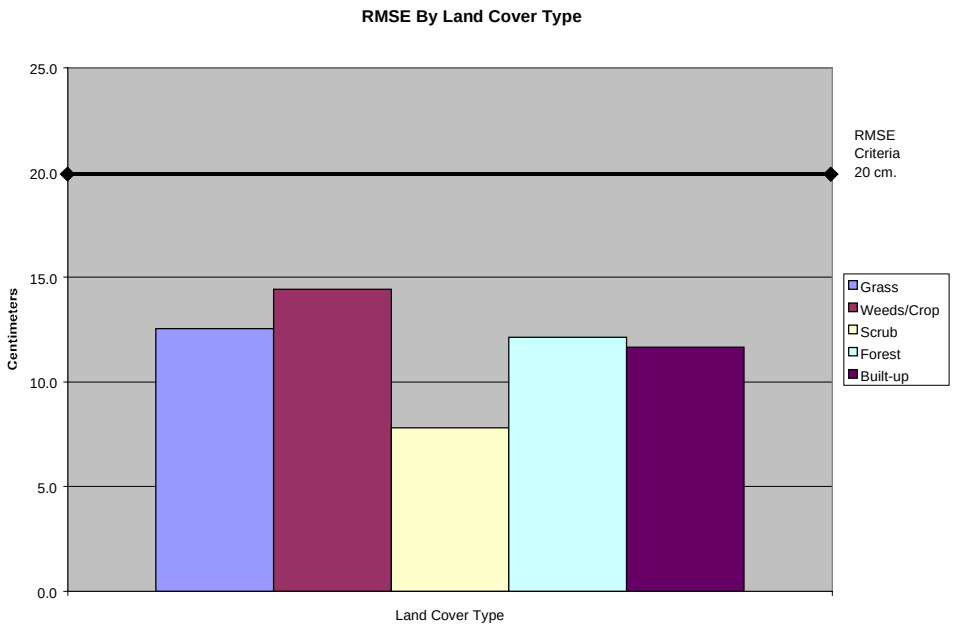

Figure 1

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.

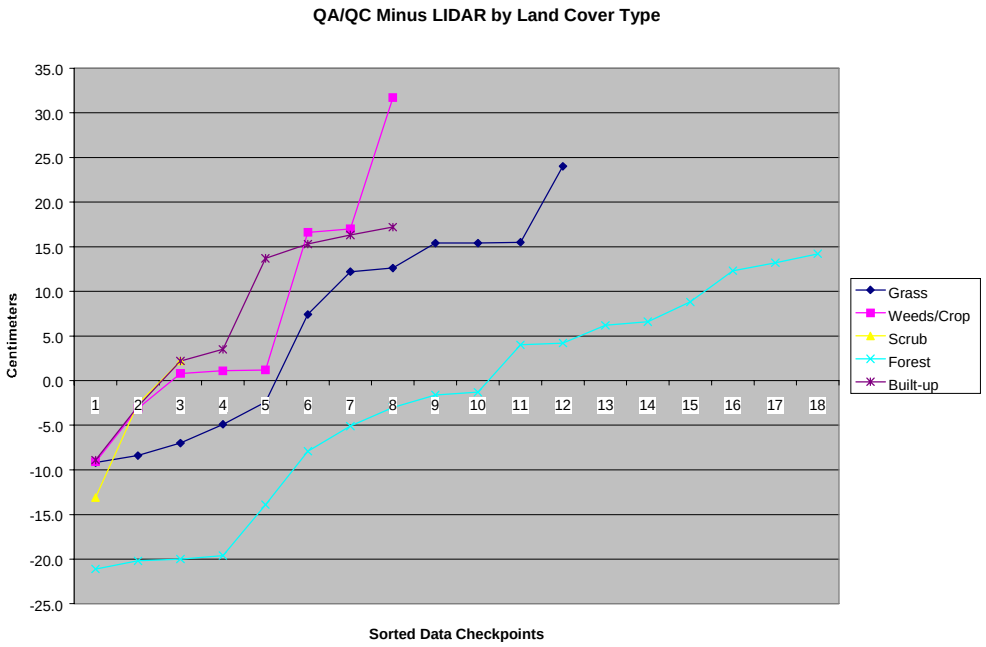

Figure 2

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**
-9.2	Grass
-8.4	Grass
-7.0	Grass
-4.9	Grass
-2.4	Grass
7.4	Grass
12.2	Grass
12.6	Grass
15.4	Grass
15.4	Grass
15.5	Grass
24.0	Grass
-9.1	Weeds/Crop
-3.1	Weeds/Crop
0.8	Weeds/Crop
1.1	Weeds/Crop
1.2	Weeds/Crop
16.6	Weeds/Crop
17.0	Weeds/Crop
31.7	Weeds/Crop
-13.1	Scrub
-2.6	Scrub
2.2	Scrub
-21.1	Forest
-20.2	Forest
-20.0	Forest
-19.6	Forest
-13.9	Forest
-7.9	Forest
-5.1	Forest
-3.0	Forest
-1.6	Forest
-1.3	Forest
4.0	Forest
4.2	Forest
6.2	Forest
6.6	Forest
8.8	Forest
12.3	Forest
13.2	Forest
14.2	Forest
-8.9	Built-up
-2.9	Built-up
2.2	Built-up
3.5	Built-up
13.7	Built-up
15.3	Built-up
16.3	Built-up
17.2	Built-up

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	**12.4**	2.6	2.2	0.0	12.2	49	-21.1	31.7
Grass	**12.5**	5.9	9.8	-0.1	11.6	12	-9.2	24.0
Weeds/Crop	**14.4**	7.0	1.1	0.9	13.5	8	-9.1	31.7
Scrub	**7.8**	-4.5	-2.6	-1.0	7.8	3	-13.1	2.2
Forest	**12.1**	-2.5	-1.5	-0.3	12.2	18	-21.1	14.2
Built-up	**11.7**	7.0	8.6	-0.5	9.9	8	-8.9	17.2

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

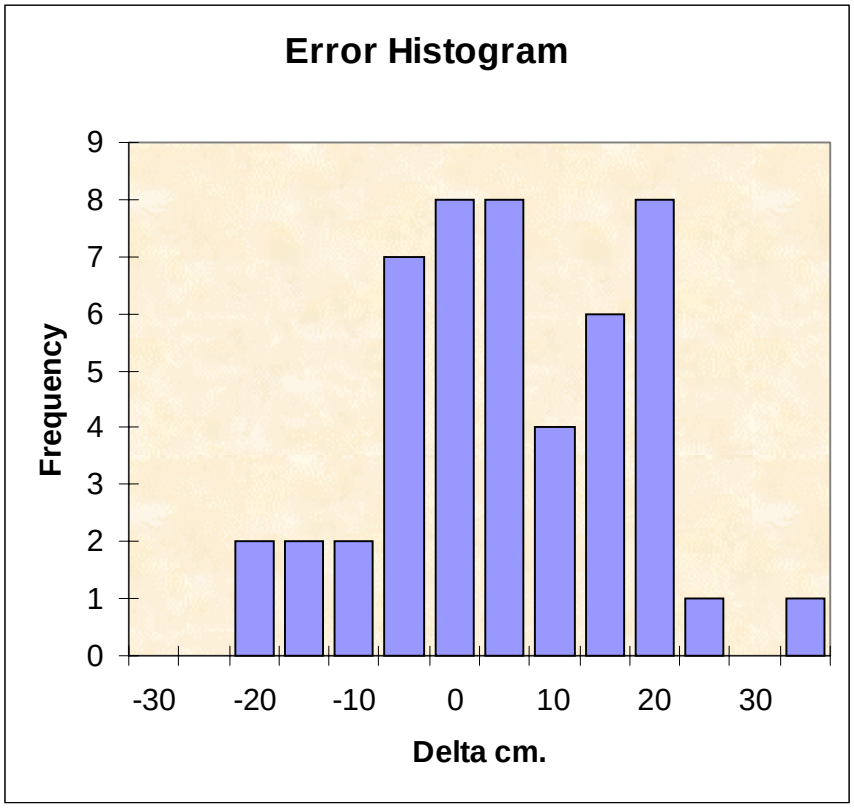

Figure 3