Orange County, Neuse 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	17.0	72	All	
95	**14.3**	**68**	**All**	**25**
17	6.7	12	Grass	
13	15.8	9	Weeds/Crop	
17	21.0	12	Scrub	
32	11.3	23	Forest	
17	15.6	12	Built-up	

The LIDAR data for Orange 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 with Land Cover type "Scrub" being slightly elevated but within specification.

Figure 1 illustrates the RMSE by specific land cover type.

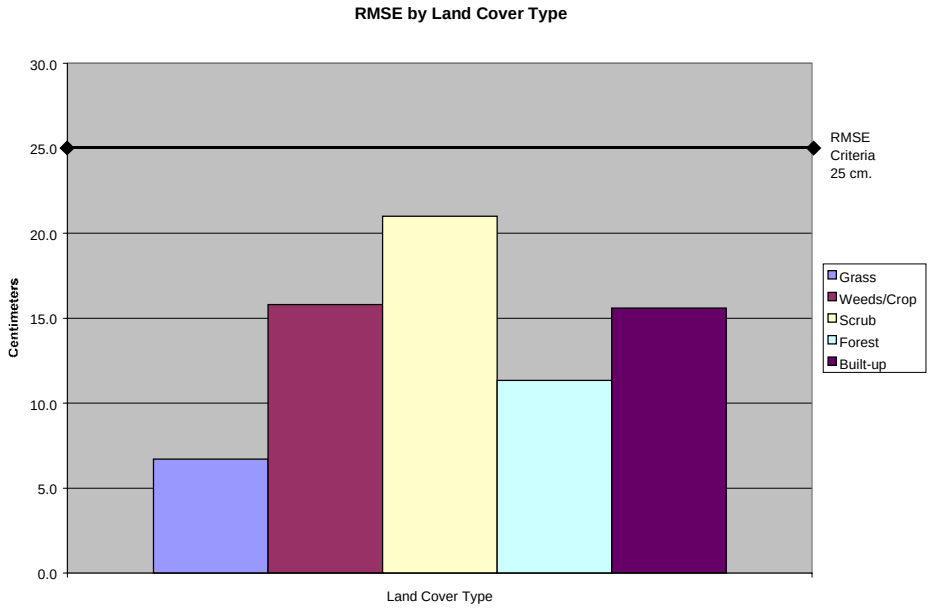

Figure 1

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.

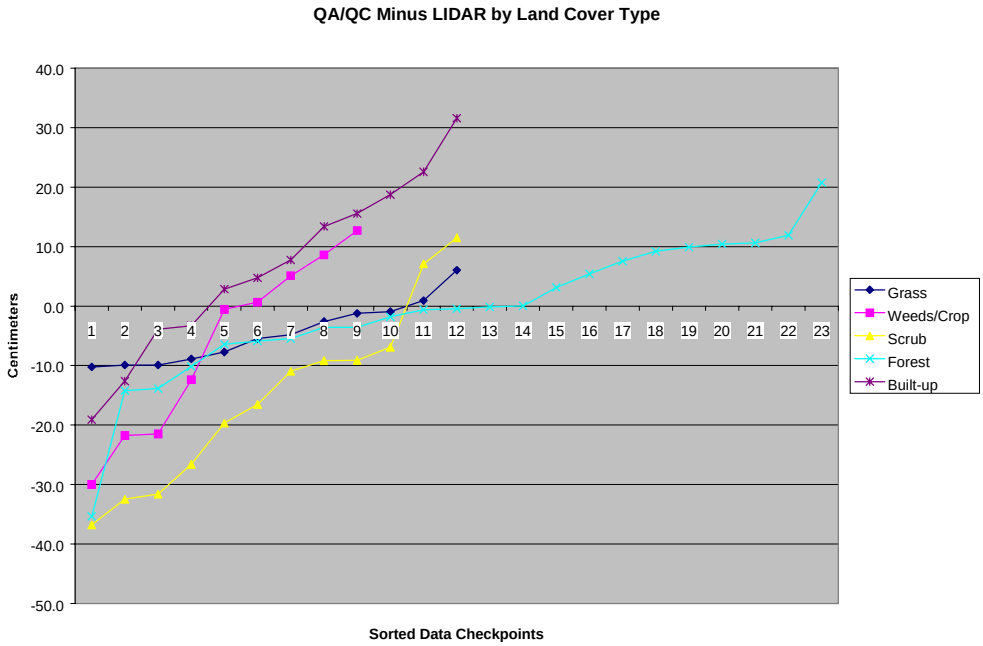

Figure 2

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**
-10.2	Grass
-9.9	Grass
-9.9	Grass
-8.9	Grass
-7.7	Grass
-5.5	Grass
-4.8	Grass
-2.6	Grass
-1.2	Grass
-0.9	Grass
0.9	Grass
6.0	Grass
-30.0	Weeds/Crop
-21.8	Weeds/Crop
-21.5	Weeds/Crop
-12.4	Weeds/Crop
-0.6	Weeds/Crop
0.7	Weeds/Crop
5.1	Weeds/Crop
8.6	Weeds/Crop
12.7	Weeds/Crop
-36.8	Scrub
-32.5	Scrub
-31.6	Scrub
-26.6	Scrub
-19.7	Scrub
-16.5	Scrub
-11.0	Scrub
-9.2	Scrub
-9.1	Scrub
-6.9	Scrub
7.1	Scrub
11.5	Scrub
-35.3	Forest
-14.2	Forest
-13.9	Forest
-10.1	Forest
-6.4	Forest
-5.9	Forest
-5.5	Forest
-3.6	Forest
-3.5	Forest
-1.8	Forest
-0.6	Forest
-0.4	Forest
-0.1	Forest
0.0	Forest
3.1	Forest
5.4	Forest
7.5	Forest
9.2	Forest
9.9	Forest
10.4	Forest
10.6	Forest
11.9	Forest
20.7	Forest
-19.1	Built-up
-12.6	Built-up
-3.9	Built-up
-3.3	Built-up
2.8	Built-up
4.7	Built-up
7.7	Built-up
13.4	Built-up
15.5	Built-up
18.7	Built-up
22.6	Built-up
31.6	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	**14.3**	-3.4	-2.9	-0.3	14.0	68	-36.8	31.6
Grass	**6.7**	-4.6	-5.1	0.7	5.1	12	-10.2	6.0
Weeds/Crop	**15.8**	-6.6	-0.6	-0.3	15.2	9	-30.0	12.7
Scrub	**21.0**	-15.1	-13.7	0.3	15.2	12	-36.8	11.5
Forest	**11.3**	-0.5	-0.4	-1.0	11.6	23	-35.3	20.7
Built-up	**15.6**	6.5	6.2	-0.1	14.8	12	-19.1	31.6

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

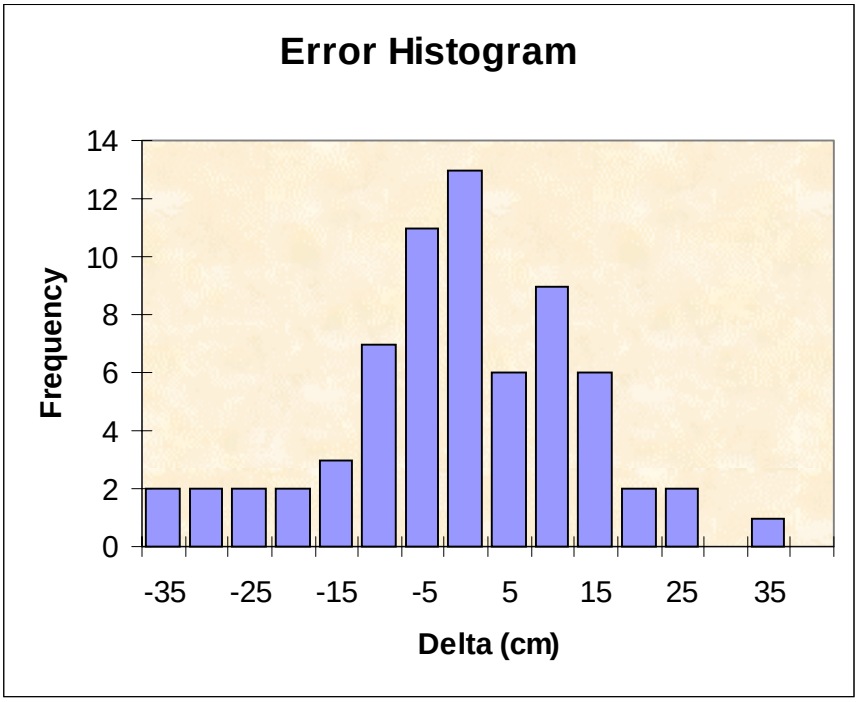

Figure 3