Dare County, Pasquotank Basin

The preliminary checkpoint spreadsheets were received from NCGS on February 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	30.9	210	All	
95	**16.0**	**199**	**All**	**20**
25	14.2	52	Grass	
16	15.1	33	Weeds/Crop	
18	14.8	39	Scrub	
20	21.2	42	Forest	
16	12.8	33	Built-up	

The LIDAR data for Dare County, Pasquotank Basin <u>meets the specification</u> as per the RMSE criteria of 20 cm.

All figures represent the data with the 95% data set and uses 210 checkpoints, double that of other counties. The data is of good quality.

Figure 1 illustrates the RMSE by specific land cover type.

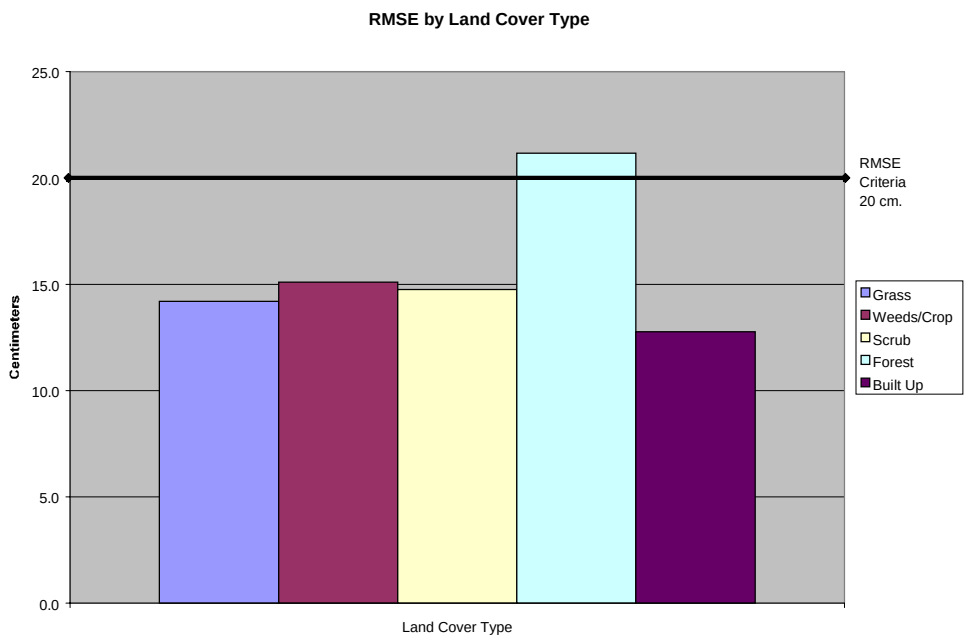

Figure 1

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.

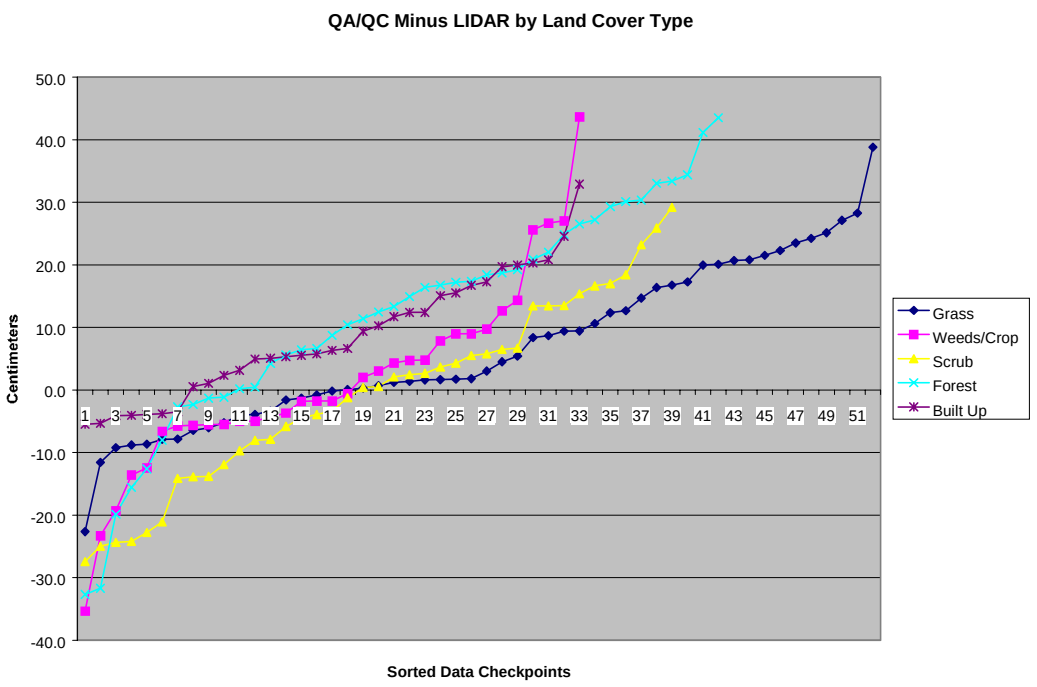

Figure 2

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
-22.7	Grass
-11.6	Grass
-9.2	Grass
-8.8	Grass
-8.7	Grass
-7.9	Grass
-7.8	Grass
-6.5	Grass
-6.1	Grass
-5.2	Grass
-4.1	Grass
-3.9	Grass
-3.4	Grass
-1.6	Grass
-1.3	Grass
-0.8	Grass
-0.2	Grass
0.1	Grass
0.3	Grass
0.7	Grass
1.2	Grass
1.4	Grass
1.6	Grass
1.6	Grass
1.7	Grass
1.8	Grass
3.0	Grass
4.5	Grass
5.4	Grass
8.4	Grass
8.7	Grass
9.4	Grass
9.4	Grass
10.6	Grass
12.4	Grass
12.7	Grass
14.7	Grass
16.4	Grass
16.8	Grass
17.3	Grass
20.0	Grass
20.1	Grass
20.7	Grass
20.8	Grass
21.5	Grass
22.3	Grass
23.5	Grass
24.2	Grass
25.1	Grass
27.1	Grass
28.3	Grass
38.8	Grass
-35.3	Weeds/Crop
-23.3	Weeds/Crop
-19.3	Weeds/Crop
-13.6	Weeds/Crop
-12.5	Weeds/Crop
-6.6	Weeds/Crop
-5.7	Weeds/Crop
-5.7	Weeds/Crop
-5.5	Weeds/Crop
-5.5	Weeds/Crop
-5.0	Weeds/Crop
-5.0	Weeds/Crop
-4.3	Weeds/Crop
-3.7	Weeds/Crop
-1.8	Weeds/Crop
-1.7	Weeds/Crop
-1.7	Weeds/Crop
-0.6	Weeds/Crop
2.0	Weeds/Crop
3.0	Weeds/Crop
4.3	Weeds/Crop
4.8	Weeds/Crop
4.8	Weeds/Crop
7.9	Weeds/Crop
9.0	Weeds/Crop
9.0	Weeds/Crop
9.7	Weeds/Crop
12.7	Weeds/Crop
14.3	Weeds/Crop
25.6	Weeds/Crop
26.7	Weeds/Crop
27.0	Weeds/Crop
43.7	Weeds/Crop
-27.4	Scrub
-24.9	Scrub
-24.4	Scrub
-24.2	Scrub
-22.7	Scrub
-21.1	Scrub
-14.1	Scrub
-13.8	Scrub
-13.8	Scrub
-11.9	Scrub
-9.7	Scrub
-8.0	Scrub
-7.9	Scrub
-5.8	Scrub
-4.5	Scrub
-3.9	Scrub
-3.4	Scrub
-1.2	Scrub
0.4	Scrub
0.6	Scrub
2.1	Scrub
2.4	Scrub
2.7	Scrub
3.7	Scrub
4.3	Scrub
5.5	Scrub
5.8	Scrub
6.5	Scrub
6.7	Scrub
13.4	Scrub
13.4	Scrub
13.5	Scrub
15.4	Scrub
16.7	Scrub
17.0	Scrub
18.4	Scrub
23.2	Scrub
25.9	Scrub
29.2	Scrub
-32.7	Forest
-31.7	Forest
-19.8	Forest
-15.5	Forest
-12.6	Forest
-8.0	Forest

-2.7	Forest
-2.3	Forest
-1.3	Forest
-1.2	Forest
0.2	Forest
0.4	Forest
4.2	Forest
5.6	Forest
6.4	Forest
6.6	Forest
8.7	Forest
10.4	Forest
11.4	Forest
12.5	Forest
13.4	Forest
14.9	Forest
16.4	Forest
16.8	Forest
17.2	Forest
17.4	Forest
18.4	Forest
18.7	Forest
19.2	Forest
20.9	Forest

22.0	Forest
24.9	Forest
26.5	Forest
27.2	Forest
29.3	Forest
30.1	Forest
30.3	Forest
33.0	Forest
33.4	Forest
34.4	Forest
41.2	Forest
43.5	Forest
-5.5	Built-up
-5.3	Built-up
-4.1	Built-up
-4.1	Built-up
-3.9	Built-up
-3.8	Built-up
-3.5	Built-up
0.5	Built-up
1.1	Built-up
2.3	Built-up
3.1	Built-up
5.0	Built-up

5.1	Built-up
5.3	Built-up
5.5	Built-up
5.8	Built-up
6.3	Built-up
6.6	Built-up
9.4	Built-up
10.3	Built-up
11.7	Built-up
12.4	Built-up
12.4	Built-up
15.1	Built-up
15.5	Built-up
16.7	Built-up
17.3	Built-up
19.7	Built-up
20.0	Built-up
20.3	Built-up
20.8	Built-up
24.6	Built-up
32.9	Built-up

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	**16.0**	5.7	4.8	0.0	14.9	199.0	-35.3	43.7
Grass	**14.2**	6.6	2.4	0.3	12.7	52.0	-22.7	38.8
Weeds/Crop	**15.1**	1.4	-1.7	0.4	15.3	33.0	-35.3	43.7
Scrub	**14.8**	-0.4	0.6	0.0	14.9	39.0	-27.4	29.2
Forest	**21.2**	11.6	14.1	-0.6	17.9	42.0	-32.7	43.5
Built Up	**12.8**	8.4	6.3	0.4	9.8	33.0	-5.5	32.9

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

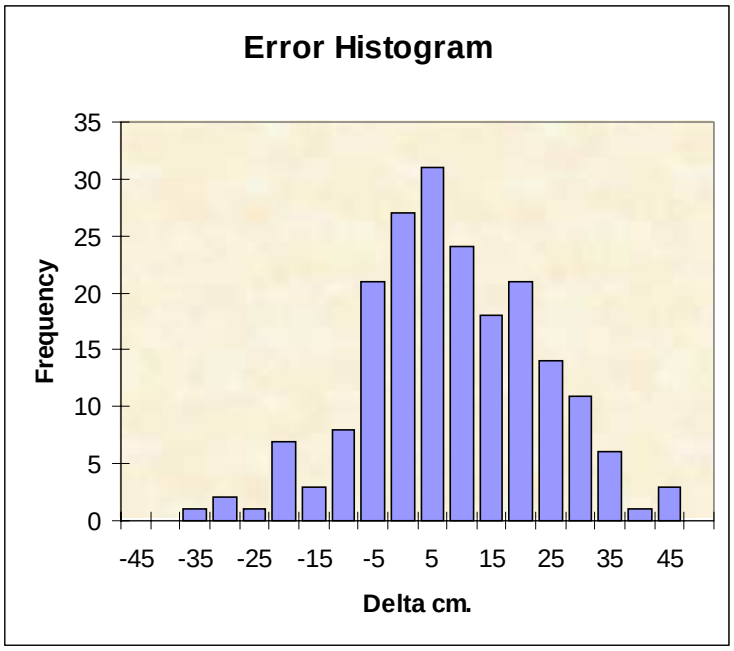

Figure 3