Warren County, Tar-Pamlico Portion

The preliminary checkpoint spreadsheets were received from NCGS on August 1, 2001. Two spreadsheets were included for each county, which compared the independent QAQC 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	16.1	72	All	
95	14.4	68	All	25
17	12.5	12	Grass	
17	17.2	12	Weeds/Crop	
17	12.9	12	Scrub	
29	14.6	21	Forest	
15	14.2	11	Built-up	

The LIDAR data for Warren County 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 within the smaller data set of 72 checkpoints.

Figure 1 illustrates the RMSE by specific land cover type.
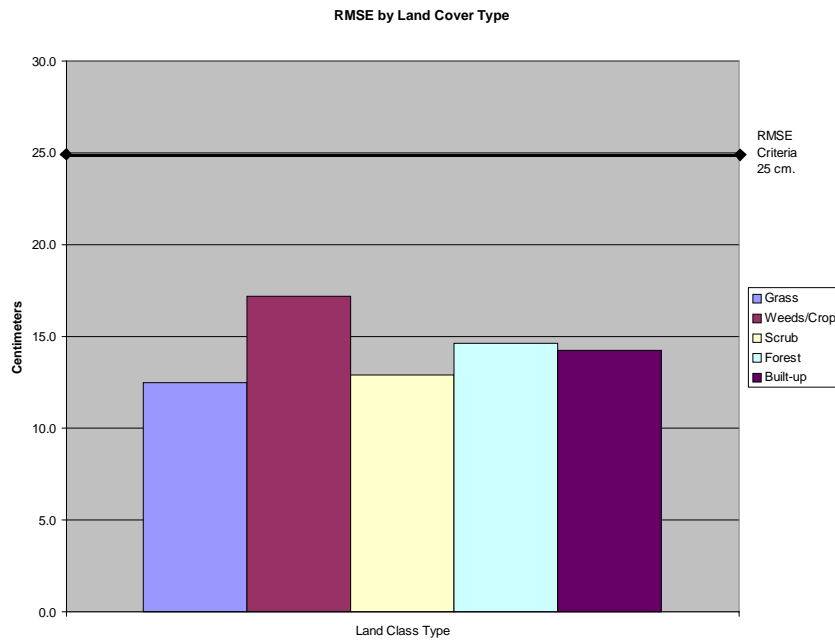
RMSE by Land Cover Type

Figure 1

Figure 2 illustrates the magnitude of the differences between the checkpoints and LIDAR data by specific land class type and sorted from lowest to highest.
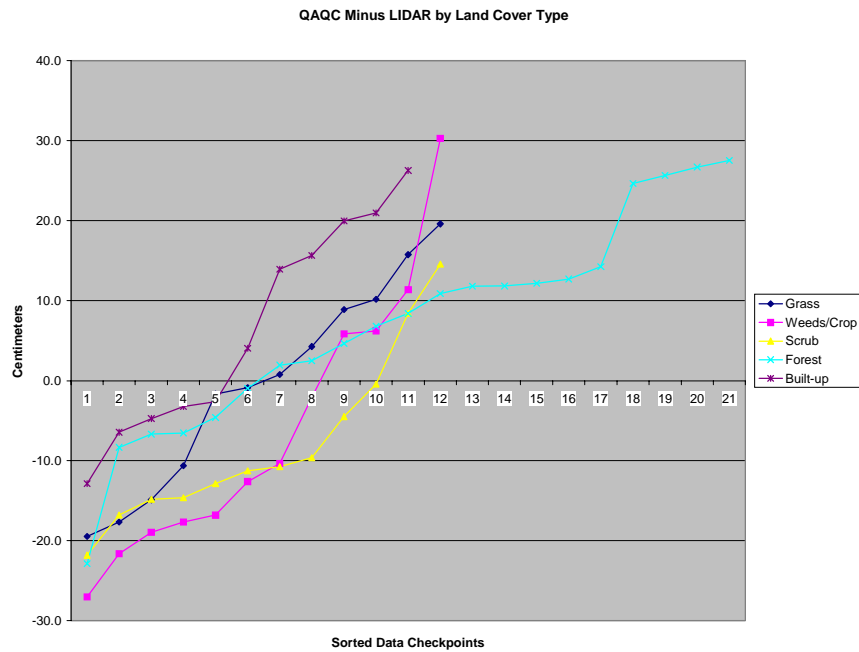
QAQC Minus LIDAR by Land Cover Type

Figure 2

Table 2 illustrates the Delta between the QAQC survey checkpoints and that of the interpolated LIDAR.

Table 2. Elevation Delta	
Delta (cm)	**Land Cover**
-19.5	Grass
-17.7	Grass
-14.9	Grass
-10.6	Grass
-1.7	Grass
-0.9	Grass
0.8	Grass
4.3	Grass
8.9	Grass
10.2	Grass
15.8	Grass
19.6	Grass
-27.0	Weeds/Crop
-21.6	Weeds/Crop
-18.9	Weeds/Crop
-17.7	Weeds/Crop
-16.8	Weeds/Crop
-12.6	Weeds/Crop
-10.4	Weeds/Crop
-2.1	Weeds/Crop
5.8	Weeds/Crop
6.2	Weeds/Crop
11.4	Weeds/Crop
30.3	Weeds/Crop
-21.8	Scrub
-16.8	Scrub
-14.8	Scrub
-14.6	Scrub
-12.9	Scrub
-11.3	Scrub
-10.7	Scrub
-9.6	Scrub
-4.5	Scrub
-0.4	Scrub
8.4	Scrub
14.6	Scrub
-22.9	Forest
-8.3	Forest
-6.7	Forest
-6.5	Forest
-4.6	Forest
-0.9	Forest
1.9	Forest
2.5	Forest
4.7	Forest
6.8	Forest
8.4	Forest
10.9	Forest
11.8	Forest
11.8	Forest
12.2	Forest
12.7	Forest
14.3	Forest
24.6	Forest
25.6	Forest
26.7	Forest
27.5	Forest
-12.9	Built-up
-6.4	Built-up
-4.7	Built-up
-3.2	Built-up
-2.6	Built-up
4.1	Built-up
13.9	Built-up
15.7	Built-up
20.0	Built-up
21.0	Built-up
26.3	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	**14.4**	0.7	-0.6	0.2	14.5	68	-27.0	30.3
Grass	**12.5**	-0.5	-0.1	-0.1	13.0	12	-19.5	19.6
Weeds/Crop	**17.2**	-6.1	-11.5	0.9	16.8	12	-27.0	30.3
Scrub	**12.9**	-7.9	-11.0	1.1	10.7	12	-21.8	14.6
Forest	**14.6**	7.3	8.4	-0.3	13.0	21	-22.9	27.5
Built-up	**14.2**	6.5	4.1	0.1	13.3	11	-12.9	26.3