Person County, Neuse Basin

The preliminary checkpoint spreadsheets were received from NCGS on November 7, 2001. Two spreadsheets were included for each county, 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)

As a result of two errors within the checkpoint survey, the two points in question were resurveyed and new values were established. These values were resubmitted by the NCGS on December 5, 2001 which included the standard spreadsheet summaries as listed above. Although the survey errors did not greatly impact the best 95% of the data, the original erroneous values did have a large affect on the 100% of the data statistics.

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	14.6	48	All	
95	**13.8**	**46**	**All**	**25**
16	11.8	8	Grass	
16	10.5	8	Weeds/Crop	
15	15.6	7	Scrub	
31	14.3	15	Forest	
16	15.7	8	Built-up	

The LIDAR data for Person County, Neuse 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.
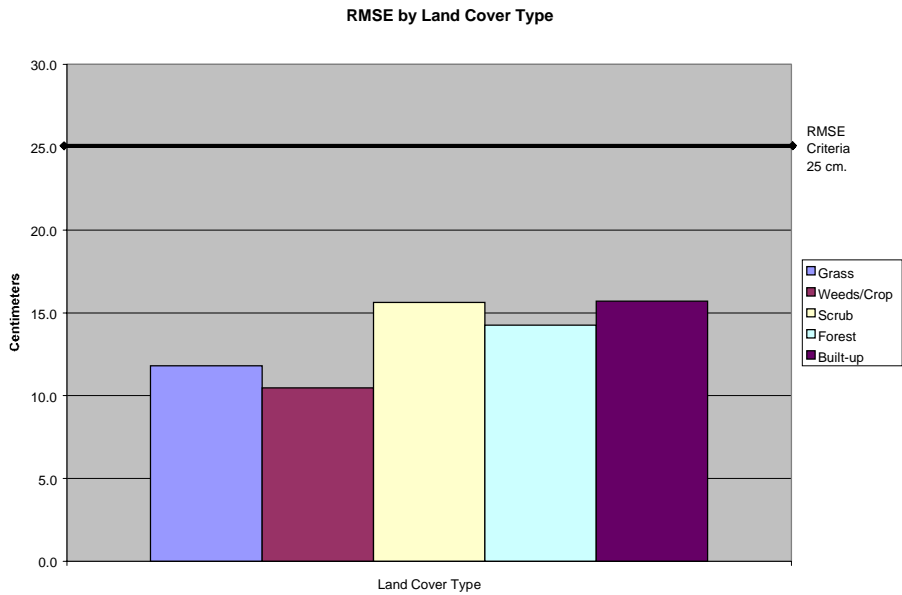
RMSE by Land Cover Type

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.
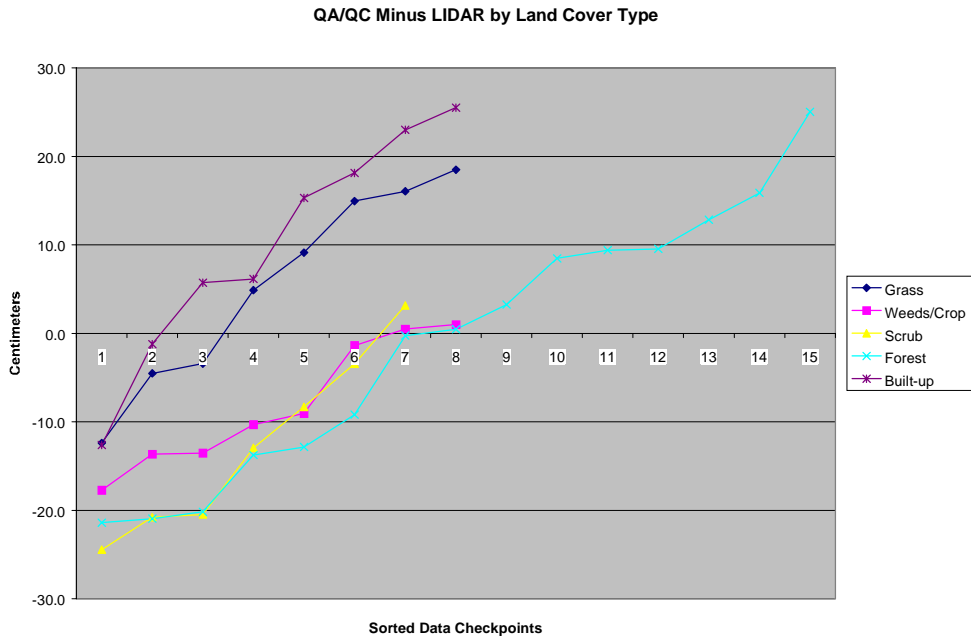
QA/QC Minus LIDAR by Land Cover Type

Figure 2

Table 2 illustrates the Delta between the QA/QC survey checkpoints and that of the interpolated LIDAR.

Table 2. Elevation Delta	
Delta (cm)	Land Cover
-12.4	Grass
-4.5	Grass
-3.4	Grass
4.9	Grass
9.1	Grass
14.9	Grass
16.0	Grass
18.5	Grass
-17.7	Weeds/Crop
-13.7	Weeds/Crop
-13.5	Weeds/Crop
-10.3	Weeds/Crop
-9.1	Weeds/Crop
-1.4	Weeds/Crop

Delta (cm)	Land Cover
0.5	Weeds/Crop
1.0	Weeds/Crop
-24.5	Scrub
-20.8	Scrub
-20.5	Scrub
-13.0	Scrub
-8.3	Scrub
-3.4	Scrub
3.2	Scrub
-21.4	Forest
-20.9	Forest
-20.2	Forest
-13.8	Forest
-12.9	Forest
-9.2	Forest
-0.3	Forest

Delta (cm)	Land Cover
0.5	Forest
3.2	Forest
8.5	Forest
9.4	Forest
9.5	Forest
12.8	Forest
15.9	Forest
25.0	Forest
-12.6	Built-Up
-1.2	Built-Up
5.7	Built-Up
6.1	Built-Up
15.3	Built-Up
18.1	Built-Up
23.0	Built-Up
25.5	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	13.8	-0.9	-0.7	0.1	13.9	46	-24.5	25.5
Grass	11.8	5.4	7.0	-0.4	11.2	8	-12.4	18.5
Weeds/Crop	10.5	-8.0	-9.7	0.2	7.2	8	-17.7	1.0
Scrub	15.6	-12.5	-13.0	0.4	10.2	7	-24.5	3.2
Forest	14.3	-0.9	0.5	0.0	14.7	15	-21.4	25.0
Built-up	15.7	10.0	10.7	-0.6	13.0	8	-12.6	25.5

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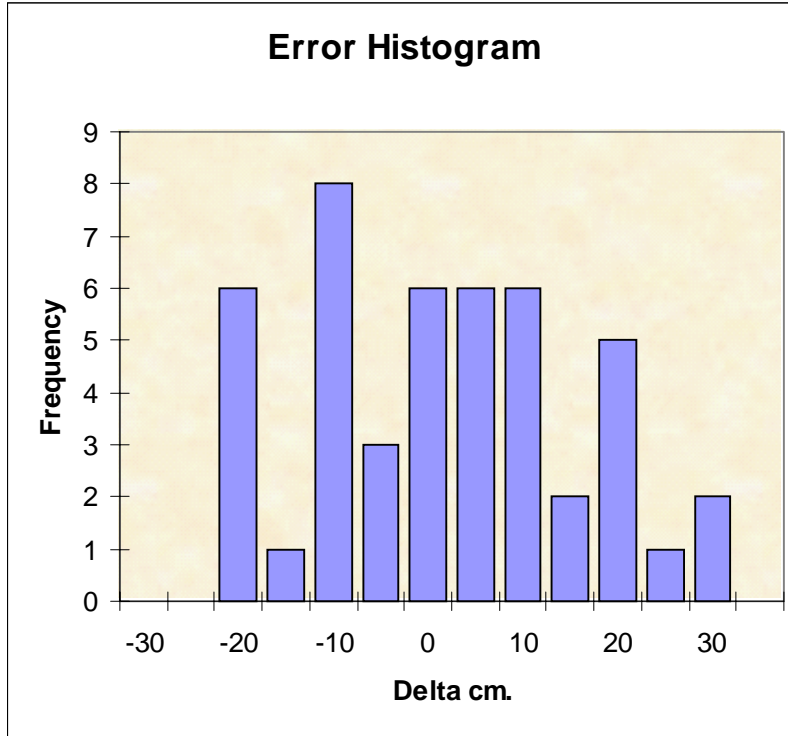
Error Histogram

Figure 3