

# LIDAR Accuracy Assessment Report—Pasquotank County

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## Pasquotank County, Pasquotank Basin

The preliminary checkpoint spreadsheets were received from NCGS on March 25, 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:

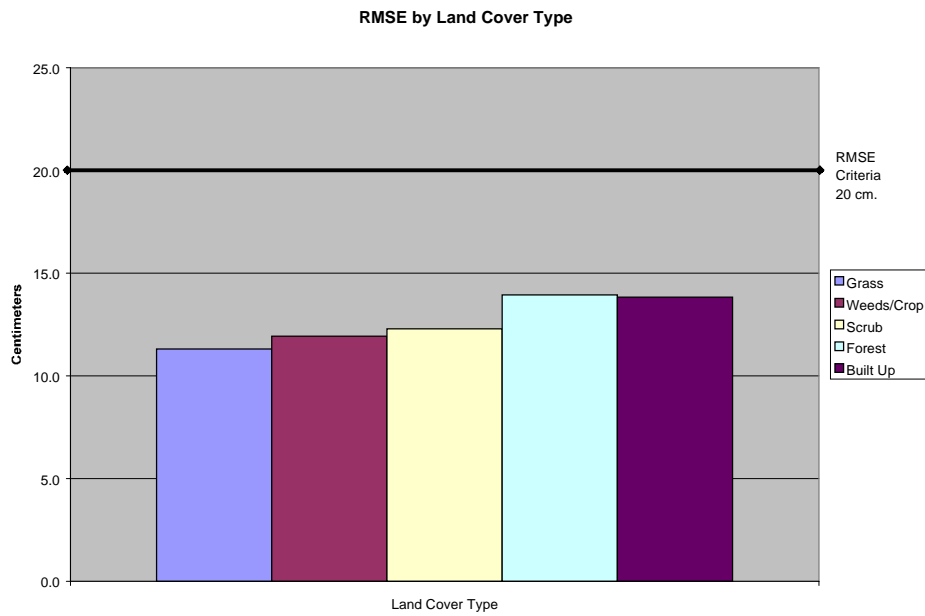
- 100% of the checkpoints
- 95% of the checkpoints
- Checkpoints categorized by land cover type

Table 1. RMSE by Land Class				
%	RMSE (cm)	# of Points	Land Class	RMSE Criteria (cm)
100	14.9	137	All	
<b>95</b>	<b>12.8</b>	<b>130</b>	<b>All</b>	<b>20</b>
19	11.3	26	Grass	
18	11.9	24	Weeds/Crop	
14	12.3	19	Scrub	
27	13.9	37	Forest	
18	13.8	24	Built-up	

The LIDAR data for Pasquotank County, Pasquotank Basin meets the specification as per the RMSE criteria of 20 cm.

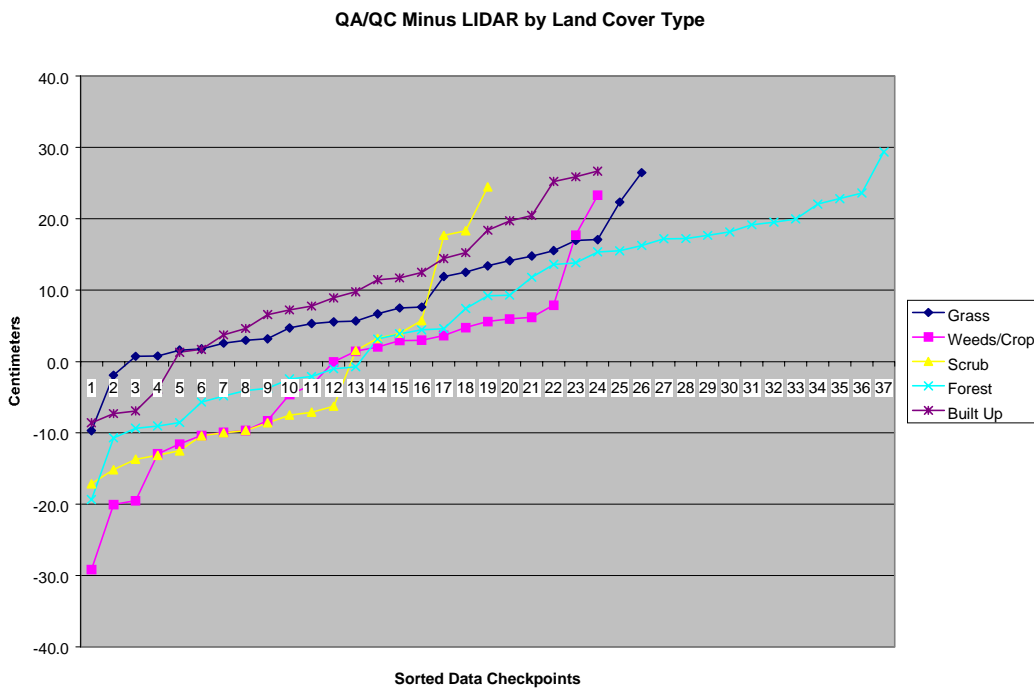
All figures represent the data with the 95% data set. The data is of good quality.

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**

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

<b>Table 2. Elevation Delta</b>			
<b>Delta (cm)</b>	<b>Land Cover</b>		
-9.7	Grass	3.7	Weeds/Crop
-1.9	Grass	4.8	Weeds/Crop
0.7	Grass	5.6	Weeds/Crop
0.8	Grass	6.0	Weeds/Crop
1.6	Grass	6.2	Weeds/Crop
1.8	Grass	7.9	Weeds/Crop
2.6	Grass	17.7	Weeds/Crop
3.0	Grass	23.3	Weeds/Crop
3.2	Grass	-17.1	Scrub
4.7	Grass	-15.1	Scrub
5.3	Grass	-13.7	Scrub
5.5	Grass	-13.2	Scrub
5.7	Grass	-12.5	Scrub
6.7	Grass	-10.4	Scrub
7.5	Grass	-10.0	Scrub
7.6	Grass	-9.7	Scrub
11.9	Grass	-8.6	Scrub
12.5	Grass	-7.5	Scrub
13.4	Grass	-7.1	Scrub
14.1	Grass	-6.3	Scrub
14.8	Grass	1.5	Scrub
15.6	Grass	3.2	Scrub
17.0	Grass	4.0	Scrub
17.1	Grass	5.7	Scrub
22.3	Grass	17.7	Scrub
26.5	Grass	18.3	Scrub
-29.2	Weeds/Crop	24.5	Scrub
-20.0	Weeds/Crop	-19.3	Forest
-19.5	Weeds/Crop	-10.7	Forest
-12.9	Weeds/Crop	-9.4	Forest
-11.6	Weeds/Crop	-9.0	Forest
-10.4	Weeds/Crop	-8.5	Forest
-9.9	Weeds/Crop	-5.7	Forest
-9.7	Weeds/Crop	-4.8	Forest
-8.3	Weeds/Crop	-4.1	Forest
-4.6	Weeds/Crop	-3.8	Forest
-3.3	Weeds/Crop	-2.4	Forest
-0.1	Weeds/Crop	-2.1	Forest
1.4	Weeds/Crop	-1.0	Forest
2.0	Weeds/Crop	-0.8	Forest
2.9	Weeds/Crop	3.1	Forest
3.0	Weeds/Crop	3.9	Forest
		4.5	Forest
		4.6	Forest
		7.4	Forest
		9.2	Forest
		9.3	Forest
		11.8	Forest
		13.6	Forest
		13.8	Forest
		15.4	Forest
		15.5	Forest
		16.3	Forest
		17.2	Forest
		17.2	Forest
		17.7	Forest
		18.2	Forest
		19.2	Forest
		19.5	Forest
		20.0	Forest
		22.1	Forest
		22.8	Forest
		23.6	Forest
		29.4	Forest
		-8.6	Built-up
		-7.3	Built-up
		-6.9	Built-up
		-3.9	Built-up
		1.3	Built-up
		1.7	Built-up
		3.7	Built-up
		4.6	Built-up
		6.6	Built-up
		7.2	Built-up
		7.8	Built-up
		8.9	Built-up
		9.8	Built-up
		11.5	Built-up
		11.7	Built-up
		12.5	Built-up
		14.5	Built-up
		15.3	Built-up
		18.4	Built-up
		19.7	Built-up
		20.5	Built-up
		25.2	Built-up
		25.9	Built-up
		26.7	Built-up

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Table 3 illustrates the overall statistics for the checkpoint data.

<b>Table 3. Overall Descriptive Statistics</b>								
	<b>RMSE (cm)</b>	<b>Mean (cm)</b>	<b>Median (cm)</b>	<b>Skew (cm)</b>	<b>Std Dev (cm)</b>	<b># of Points</b>	<b>Min (cm)</b>	<b>Max (cm)</b>
<b>Total</b>	<b>12.8</b>	4.6	4.6	-0.1	12.0	130	-29.2	29.4
<b>Grass</b>	<b>11.3</b>	8.1	6.2	0.3	8.1	26	-9.7	26.5
<b>Weeds/Crop</b>	<b>11.9</b>	-2.3	0.7	-0.1	12.0	24	-29.2	23.3
<b>Scrub</b>	<b>12.3</b>	-3.0	-7.5	1.1	12.3	19	-17.1	24.5
<b>Forest</b>	<b>13.9</b>	7.4	9.2	-0.2	12.0	37	-19.3	29.4
<b>Built Up</b>	<b>13.8</b>	9.4	9.3	-0.1	10.3	24	-8.6	26.7

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

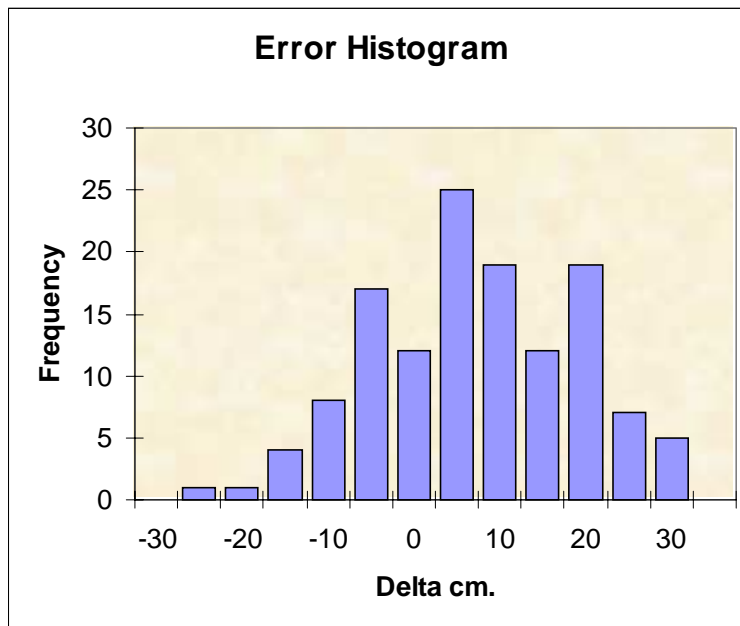


Figure 3