

# LIDAR Accuracy Assessment Report Onslow County

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## Onslow

The preliminary checkpoint spreadsheets were received from NCGS on June 14, 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

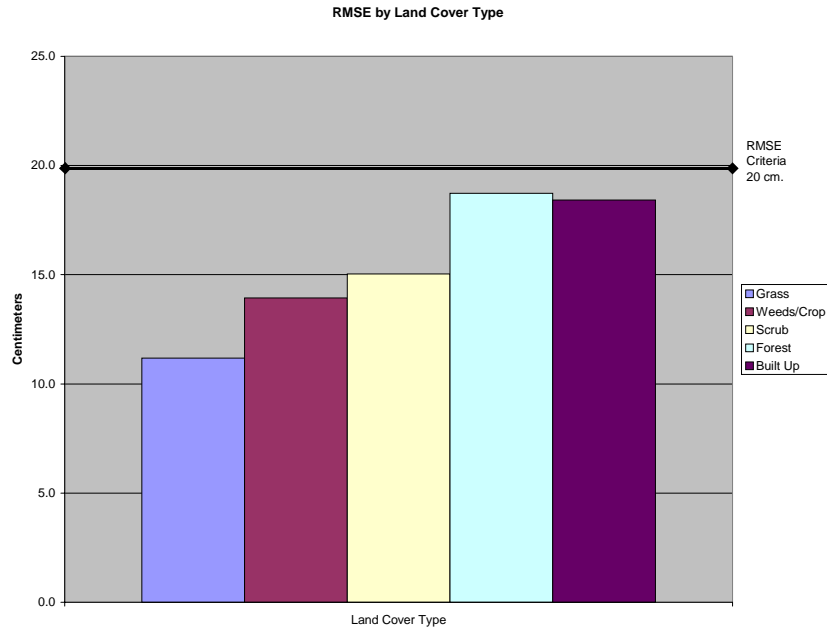
| Table 1. RMSE by Land Class |             |             |            |                    |
|-----------------------------|-------------|-------------|------------|--------------------|
| %                           | RMSE (cm)   | # of Points | Land Class | RMSE Criteria (cm) |
| 100                         | 21.4        | 120         | All        |                    |
| <b>95</b>                   | <b>16.4</b> | <b>114</b>  | <b>All</b> | <b>20</b>          |
| 15                          | 11.2        | 18          | Grass      |                    |
| 15                          | 13.9        | 18          | Weeds/Crop |                    |
| 14                          | 15.0        | 17          | Scrub      |                    |
| 38                          | 18.7        | 45          | Forest     |                    |
| 13                          | 18.4        | 16          | Built-up   |                    |

**The LIDAR data for Onslow county name 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 however the land cover type "Built-up" is higher than typically expected. The RMSE calculation differs from the original data set as supplied by NCGS due to an oversight in removing the largest 5% of errors. This data set reflects the correct RMSE value.

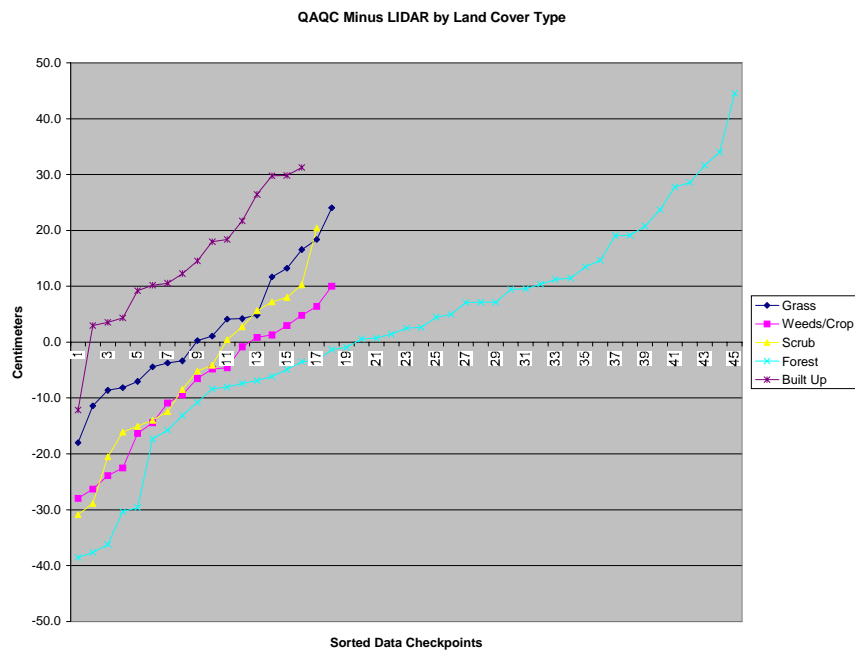
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Figure 1 illustrates the RMSE by specific land cover type.



**Figure 1**

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



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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 |       |        |       |          |
| -18.0                    | Grass      | -28.9 | Scrub  | 2.6   | Forest   |
| -11.4                    | Grass      | -20.5 | Scrub  | 4.5   | Forest   |
| -8.6                     | Grass      | -16.1 | Scrub  | 5.0   | Forest   |
| -8.1                     | Grass      | -15.1 | Scrub  | 7.1   | Forest   |
| -7.0                     | Grass      | -14.0 | Scrub  | 7.1   | Forest   |
| -4.4                     | Grass      | -12.4 | Scrub  | 7.2   | Forest   |
| -3.7                     | Grass      | -8.5  | Scrub  | 9.4   | Forest   |
| -3.4                     | Grass      | -5.2  | Scrub  | 9.6   | Forest   |
| 0.3                      | Grass      | -4.1  | Scrub  | 10.4  | Forest   |
| 1.1                      | Grass      | 0.4   | Scrub  | 11.2  | Forest   |
| 4.1                      | Grass      | 2.8   | Scrub  | 11.5  | Forest   |
| 4.2                      | Grass      | 5.6   | Scrub  | 13.4  | Forest   |
| 4.8                      | Grass      | 7.2   | Scrub  | 14.7  | Forest   |
| 11.7                     | Grass      | 8.0   | Scrub  | 19.1  | Forest   |
| 13.2                     | Grass      | 10.3  | Scrub  | 19.1  | Forest   |
| 16.6                     | Grass      | 20.4  | Scrub  | 20.8  | Forest   |
| 18.4                     | Grass      | -38.5 | Forest | 23.7  | Forest   |
| 24.0                     | Grass      | -37.6 | Forest | 27.8  | Forest   |
| -28.0                    | Weeds/Crop | -36.2 | Forest | 28.6  | Forest   |
| -26.3                    | Weeds/Crop | -30.3 | Forest | 31.6  | Forest   |
| -23.9                    | Weeds/Crop | -29.6 | Forest | 34.0  | Forest   |
| -22.5                    | Weeds/Crop | -17.3 | Forest | 44.5  | Forest   |
| -16.3                    | Weeds/Crop | -15.8 | Forest | -12.2 | Built-up |
| -14.4                    | Weeds/Crop | -13.2 | Forest | 3.0   | Built-up |
| -10.9                    | Weeds/Crop | -10.8 | Forest | 3.6   | Built-up |
| -9.4                     | Weeds/Crop | -8.4  | Forest | 4.3   | Built-up |
| -6.5                     | Weeds/Crop | -8.1  | Forest | 9.2   | Built-up |
| -4.8                     | Weeds/Crop | -7.4  | Forest | 10.2  | Built-up |
| -4.6                     | Weeds/Crop | -6.9  | Forest | 10.6  | Built-up |
| -0.8                     | Weeds/Crop | -6.1  | Forest | 12.3  | Built-up |
| 0.9                      | Weeds/Crop | -4.9  | Forest | 14.6  | Built-up |
| 1.3                      | Weeds/Crop | -3.5  | Forest | 18.0  | Built-up |
| 3.0                      | Weeds/Crop | -3.3  | Forest | 18.4  | Built-up |
| 4.8                      | Weeds/Crop | -1.3  | Forest | 21.7  | Built-up |
| 6.4                      | Weeds/Crop | -0.9  | Forest | 26.4  | Built-up |
| 10.0                     | Weeds/Crop | 0.6   | Forest | 29.8  | Built-up |
| -30.9                    | Scrub      | 0.7   | Forest | 29.8  | Built-up |
|                          |            | 1.4   | Forest | 31.3  | Built-up |
|                          |            | 2.5   | Forest |       |          |

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Table 3 illustrates the overall statistics for the checkpoint data.

| <b>Table 3. Overall Descriptive Statistics</b> |                      |                      |                        |                      |                         |                        |                     |                     |
|--|----------------------|----------------------|------------------------|----------------------|-------------------------|------------------------|---------------------|---------------------|
|  | <b>RMSE<br/>(cm)</b> | <b>Mean<br/>(cm)</b> | <b>Median<br/>(cm)</b> | <b>Skew<br/>(cm)</b> | <b>Std Dev<br/>(cm)</b> | <b># of<br/>Points</b> | <b>Min<br/>(cm)</b> | <b>Max<br/>(cm)</b> |
| <b>Total</b>                                   | <b>16.4</b>          | 1.0                  | 1.4                    | -0.1                 | 16.5                    | 114                    | -38.5               | 44.5                |
| <b>Grass</b>                                   | <b>11.2</b>          | 1.9                  | 0.7                    | 0.3                  | 11.3                    | 18                     | -18.0               | 24.0                |
| <b>Weeds/Crop</b>                              | <b>13.9</b>          | -7.9                 | -5.7                   | -0.3                 | 11.8                    | 18                     | -28.0               | 10.0                |
| <b>Scrub</b>                                   | <b>15.0</b>          | -5.9                 | -5.2                   | -0.1                 | 14.2                    | 17                     | -30.9               | 20.4                |
| <b>Forest</b>                                  | <b>18.7</b>          | 2.0                  | 2.5                    | -0.2                 | 18.8                    | 45                     | -38.5               | 44.5                |
| <b>Built Up</b>                                | <b>18.4</b>          | 14.4                 | 13.4                   | -0.4                 | 11.8                    | 16                     | -12.2               | 31.3                |