

DPH-8 Report on Smooth Surface Precision (intraswath)

The USGS Lidar Base Specification Version 1.3 states: "The precision of lidar is the quantified assessment of variations in measurements of a surface that, under ideal theoretical conditions, would be without variation. Assessment will be made on hard surfaced areas (for example, parking lots or large rooftops) containing only single return lidar points. Each test area will be evaluated using a signed difference raster with a cell size equal to the ANPS, rounded up to the next integer, then doubled. Sample areas will be approximately 100 pixels. The difference rasters will be statistically summarized to verify that root mean square difference in the z direction (RMSD_z) values do not exceed the limits set forth in the 'Smooth surface' column of Table 2 for the QL of information that is being collected."

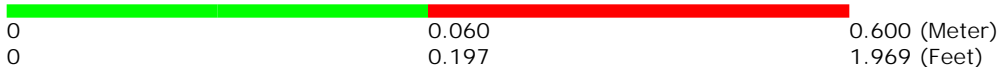
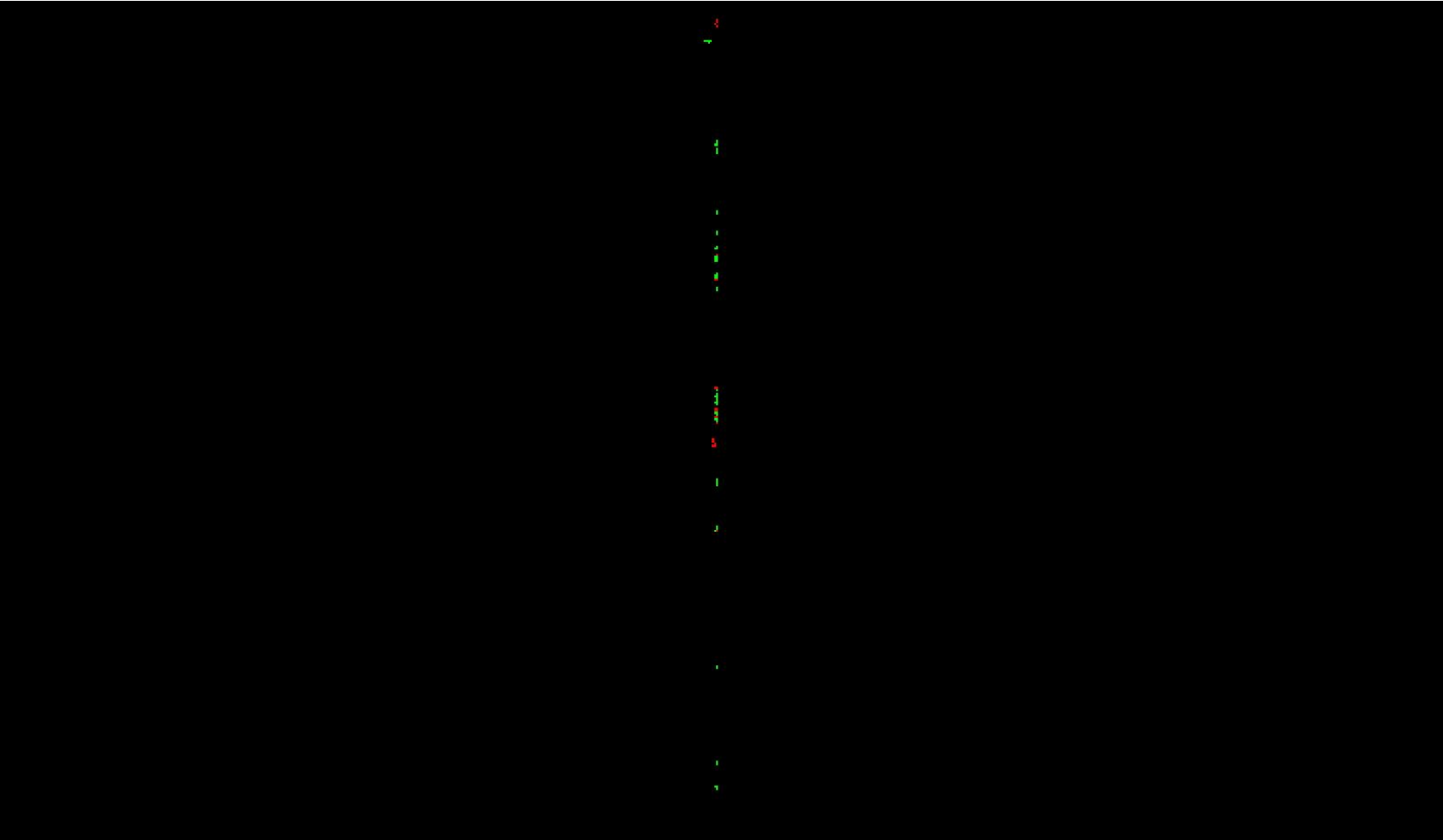
Table 2. Relative vertical accuracy for light detection and ranging swath data.

[QL, quality level; RMSD_z, root mean square difference in the z direction; m, meter; ≤, less than or equal to]

Quality level	Smooth surface repeatability, RMSD _z (m)	Swath overlap difference, RMSD _z (m)
QL0	≤0.03	≤0.04
QL1	≤0.06	≤0.08
QL2	≤0.06	≤0.08
QL3	≤0.12	≤0.16

The purpose of this section is to evaluate smooth surface repeatability / intraswath precision by measuring departures from planarity of single returns from hard planar surfaces, normalizing for actual variation in the surface elevation. Repeatability of clusters of single returns is then assessed at multiple locations within hard surfaced areas (for example, parking lots or large rooftops).

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A maximum vertical separation cutoff has been applied to this graphic for the purpose of masking out disruptive features that are not applicable for depicting sensor noise within individual swaths (e.g., trees, moving cars, etc.).