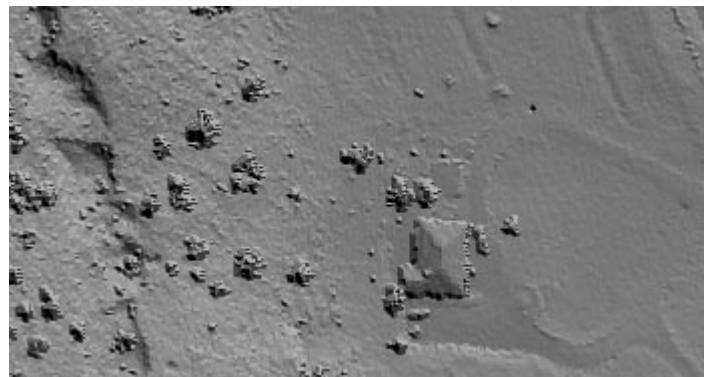


# Viewing Virtual Surface Aids Reclassification

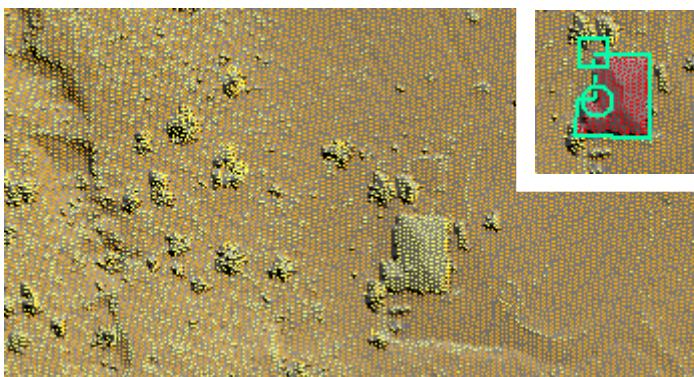
You can display, pan, and zoom a LIDAR point cloud in the standard LAS file format in real time as a virtual surface created from your choice of the LIDAR point classes. You can display this surface in grayscale shaded relief, colored by elevation, or a combination (see the Technical Guide entitled *LIDAR: View LAS Point Cloud as Surface*). In comparison to a simple display of classified points, these virtual surface options make it much easier to visualize the 3D information contained in the points over a broad area. If points other than ground points are included in a shaded surface rendering, it is easy to recognize buildings, trees, and other above-ground features. Guided by the shapes visible in the virtual surface, you can use the area selection tools in the GeoToolbox to outline specific areas to select the contained

points (even when the points themselves are not currently shown). You can then reclassify specific point classes in the selected point set to a different point class (see the TechGuide entitled *LIDAR: Interactive Editing of Point Classes*). The virtual surface is automatically updated to reflect the change in classification. Since you can create the virtual surface from any selection of point classes, reclassifying points may produce dramatic changes in the virtual surface if the reclassification moves points to a class not being used to generate the surface.

The illustrations below and on the reverse provide examples of the use of a shaded virtual surface as a visual reference for reclassifying points in a partially-classified LIDAR point cloud.

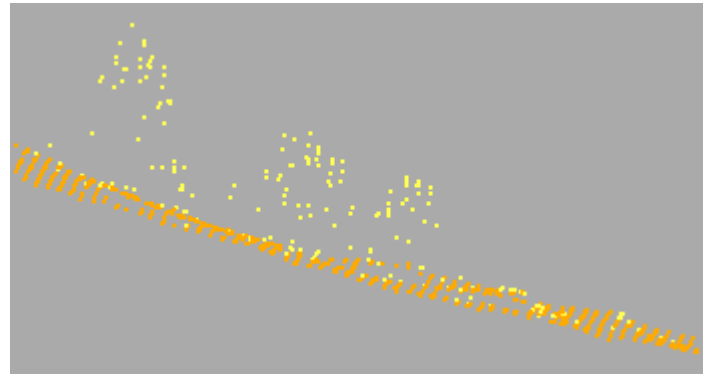
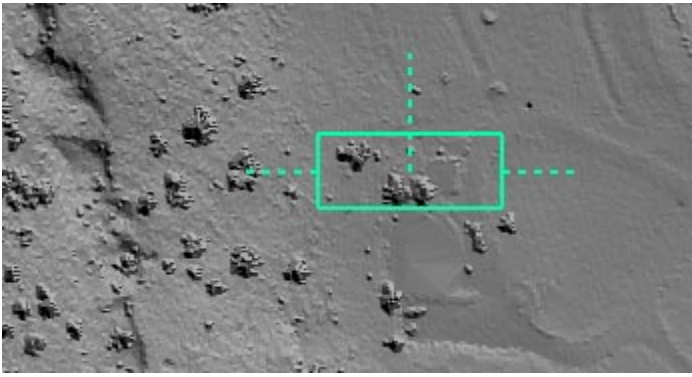


Orthoimage (left) and relief-shaded virtual surface (right) constructed in the TNT view from LAS LIDAR points of a small area (165 meters across) outside Denver, Colorado. The scene includes a house, driveway, and scattered trees. LIDAR points covering this area (shown in illustration below left) have a spacing of 50 to 70 centimeters. Bare-earth points have been classified by the vendor using an automated procedure, leaving remaining points unclassified. The virtual surface is based on both bare-earth and unclassified points, so the house and trees are clearly visible in the virtual surface along with natural topographic features. See the Technical Guide entitled *LIDAR: View LAS Point Cloud as Surface* for details on virtual surface display.

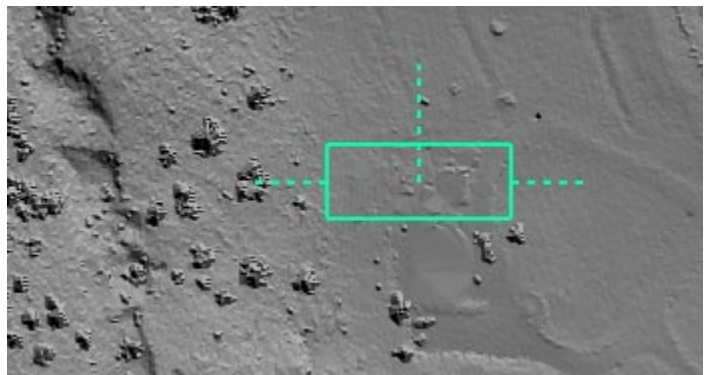
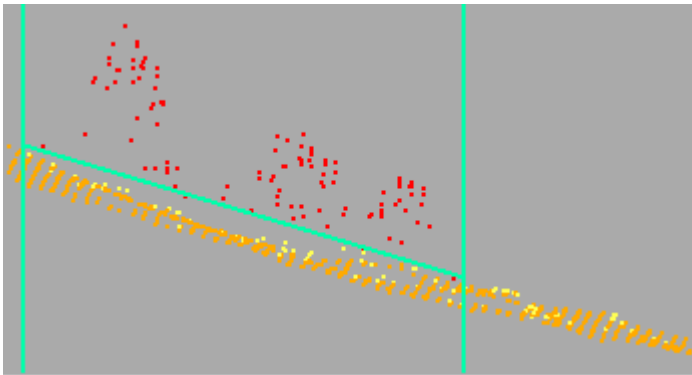


In the illustration on the left, ground (orange) and unclassified (yellow) LIDAR points are overlaid on the shaded virtual surface, which helps to identify clusters of unclassified points as structures and trees. In the inset, the GeoToolbox polygon tool is used to outline and select the points covering the house (red). The Reclassify procedure was then used to change the classification of the unclassified points in the selected set to the building class (see the TechGuide entitled *LIDAR: Interactive Editing of Point Classes*). Since the latter class is not used in creating the virtual surface in the view, the updated virtual surface (right) no longer shows the house. The portion of the surface that coincides with the house footprint is interpolated from the surrounding (ground) points and thus approximates a bare-earth surface.

(over)



The illustration on the left shows the virtual surface derived from the LIDAR points after reclassification of the house points. The Point Profile tool (green rectangle) is used to outline an area north of the house footprint. LIDAR points (not displayed) within the box area are used by the tool to create a vertical point profile (shown to the right, looking north; see the TechGuide entitled *LIDAR: Point Profile Tool*). The points shown in the profile include ground points (orange) that define a downward slope to the east, and unclassified points (yellow) above the ground that define several trees.



In the illustration on the left, the threshold tool is used in the Point Profile to place a sloping threshold line (green, between the vertical green lines) slightly above the ground surface and select points above that threshold (selected points shown in red; see the see the TechGuide entitled *LIDAR: Point Profile Tool*). The unclassified points in the selected set were then reclassified to the medium vegetation class. Since the latter class is not used in creating the virtual surface in the view, the updated virtual surface (illustrated on the right) no longer shows the trees within the profile area.

