

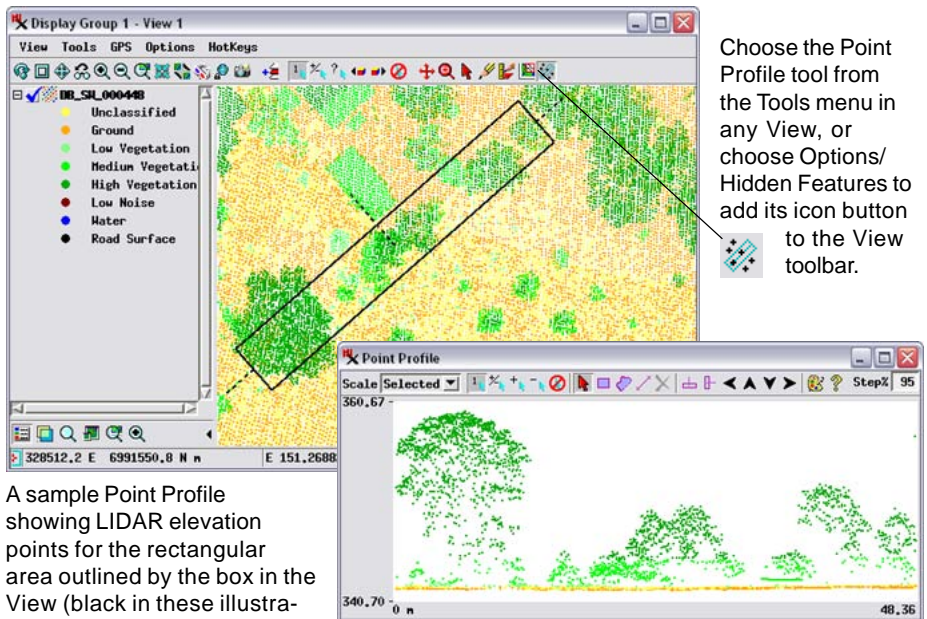
Point Profile Tool

The Point Profile tool creates a vertical profile of 3D points falling within the rectangular area you designate in the View window. This tool is designed for use with 3D points in a LIDAR, vector, or shape layer. If you have chosen to display a subset of the available points (e.g., particular point classes or return types), the profile shows only the points displayed in the View. The Point Profile allows you to visualize the 3D relationships of the points and provides several methods for manually marking points or groups of points within the profile for closer inspection or reclassification (see the TechGuide entitled *LIDAR: Interactive Editing of Point Classes*). The Point Profile tool is available in every geospatial view in the TNT products.

Profile Box and Point Profile

Activating the Point Profile tool automatically sets an initial profile selection box centered in the View and opens the Point Profile window showing the vertical profile for that area. The dashed line extending outward from the center of the profile box indicates the direction of the profile view and provides a handle for rotating the box around its center (see illustration below left). The dashed end lines provide handles for rotating the box around the outer end of the opposite end line. You can also press the Horizontal or Vertical icon button on the Point Profile window (illustration below right) to quickly change the box orientation. (This selection is also retained as the default box orientation).

Drag the corners or edges of the profile box to resize it or drag within the box to reposition it. The Step icon buttons on the Point Profile window (or the corresponding keyboard arrow keys) also allow you to quickly move the box forward, backward, left, or right (relative to the view direction) by an increment of the box size (set



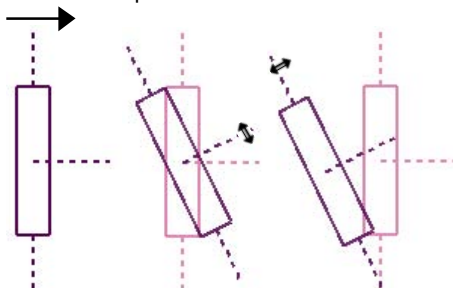
Choose the Point Profile tool from the Tools menu in any View, or choose Options/Hidden Features to add its icon button to the View toolbar.

A sample Point Profile showing LIDAR elevation points for the rectangular area outlined by the box in the View (black in these illustrations). The LIDAR point colors indicate preliminary point classifications assigned using a geospatial script (SML) that compares individual point elevations to elevations in a digital elevation model (DEM) computed from the ground points. Orange points are ground, dark green points are high vegetation, lighter green points are medium vegetation, and unclassified points are yellow. Buildings and other manmade structures above ground are lumped with vegetation in this preliminary classification. These building points can be interactively reclassified as described in the TechGuide entitled *LIDAR: Interactive Editing of Point Classes*.

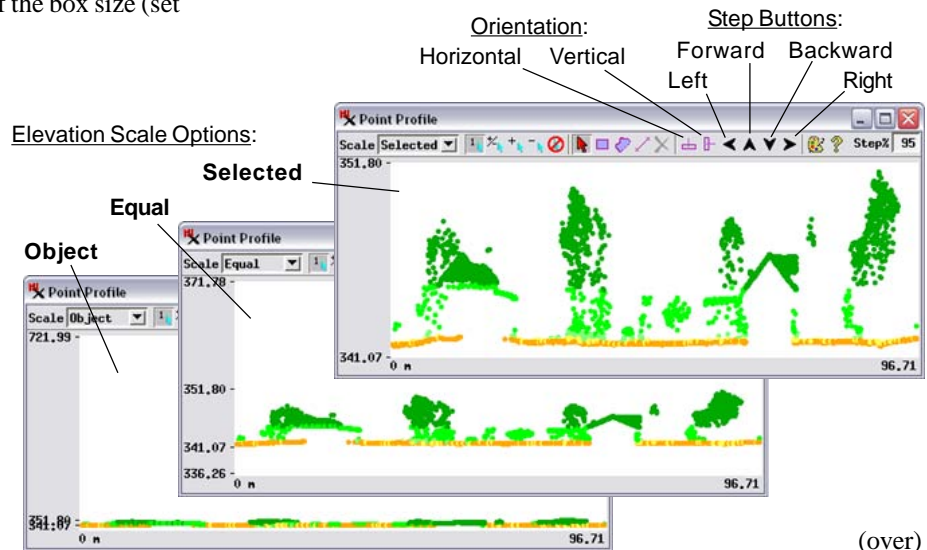
by the Step % value). You can also use the mouse wheel to move the box forward and backward.

The vertical elevation range of the profile is set by the Scale menu. The Object option sets the vertical axis range to the elevation range of the entire point object, which may result in a very flat profile for a local area. The Equal option sets the elevation range so that horizontal and vertical profile scales are equal. The Selected option sets the elevation range based on the points in the profile box and automatically adjusts the vertical scale to fill the profile pane (see illustration below).

Direction of profile view



Drag the dashed line originating at the center of the box to rotate the profile box around its center. Drag one of the dashed end lines to pivot box around the opposite end. Holding down the shift key while rotating snaps the box orientation to the nearest increment of 45-degrees.



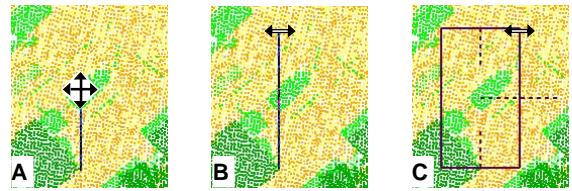
(over)

The View is automatically recentered if resizing, repositioning, or reorienting the profile selection box brings any edge of the box close to or beyond the current extents of the View. As you move your mouse cursor over the Point Profile, its position is tracked by a cross cursor along the centerline of the profile box in the View.

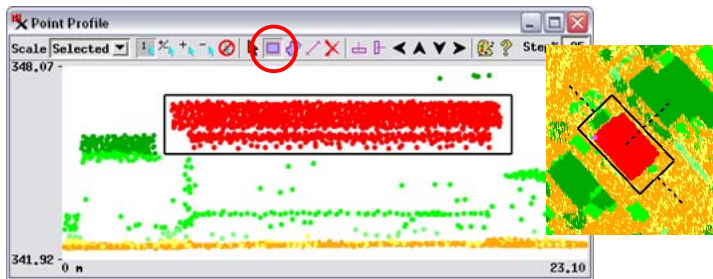
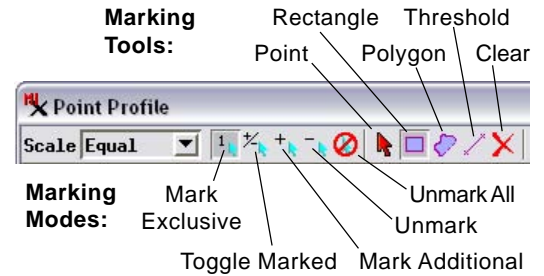
To draw a new profile box, left-click outside of the previous box and drag along the desired profile line as shown in A in the illustration to the right. When the line is the desired length, release the left mouse button; the screen cursor switches to the double-arrow form (B). Then drag again perpendicular to the profile line (C) and left-click when the box is the desired width.

Marking (Selecting) Points

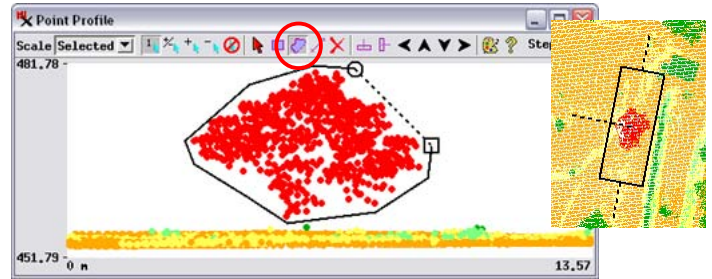
The Point Profile window provides several graphic tools for marking (selecting) points or groups of points in the profile (see the illustration to the right). Any points marked in the Point Profile using these tools are also automatically marked in the View window. (You can also mark LIDAR points in the View using GeoToolbox tools, and the corresponding points are marked in the Point Profile.) You can therefore easily compare the distribution and shape of the marked point set in both plan and profile. Modes for the marking tools (such as Mark Exclusive, Toggle Marked, etc.) can be set using additional icon buttons on the Point Profile toolbar, as in the GeoToolbox.



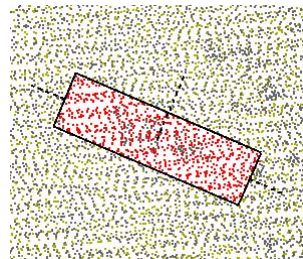
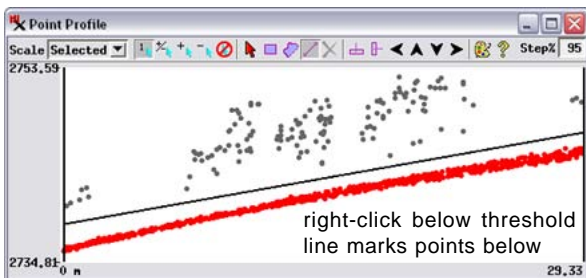
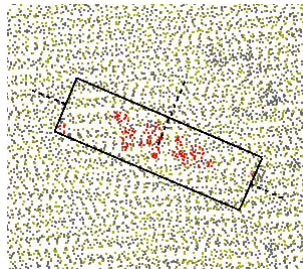
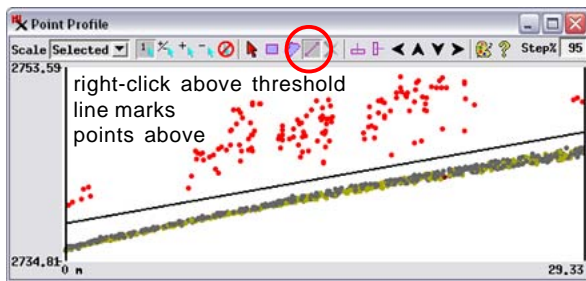
To draw a new profile box, left-click and drag along the desired profile line (A). When the line is the desired length, release the left mouse button; the screen cursor switches to the double-arrow form (B). Then drag again perpendicular to the profile line (C) and left-click when the box is the desired width.



LIDAR points marked using the Rectangle tool in the Point Profile. Marked points (red in this illustration) are also marked in the View (illustration to the right). The shape of this point set in profile and plan views indicates that these points represent the pitched roof of a rectangular building.



LIDAR points marked using the Polygon tool in the Point Profile. Marked points (red in this illustration) are also marked in the View (illustration to the right). The globular shape of this point set in profile and plan views and its height above the ground surface indicates that most of the marked points are returns from the foliage and branches of a tree.



Use the Threshold tool to draw a threshold line at any position and angle across the profile. The limits of the threshold line are indicated by vertical lines. Once you have drawn the threshold line, you can drag the line up or down or drag either end to change the extent and tilt of the line. Right-click above or below the threshold line to mark the profile points on that side of the threshold and within the limits of the vertical bounding lines. Marked points are red in these illustrations.

The Point tool in the Point Profile window can be used for marking individual points, while the Rectangle and Polygon tools can be used to outline groups of points in the profile. Each of these three tools has counterparts in the GeoToolbox in the View window.

The Threshold tool is a group selection tool that is unique to the Point Profile window. The threshold tool allows you to draw and reposition a threshold line of any length, position, and angle within the profile. The limits of the threshold line are shown by vertical lines extending the full height of the profile (see the illustrations to the left). Right-clicking above the threshold line marks points above the line, while right-clicking below the threshold line marks points below the line (and within the threshold line limits in both cases). The Threshold tool is very useful for marking ground points below the threshold or vegetation or building points above the threshold.