

Control Points for Manifold Surfaces

A manifold contains its own shape and position information in the form of a set of 3D georeference control points defined using the Manifold geometric model. This 3D piecewise affine model connects the control points to form a triangular mesh that defines a projective surface for 3D perspective display of the raster or geometric object manifold. The Georeference process provides a 2D view of the input object with overlays showing the control points and resulting triangulation (which is based solely on the distribution of the control points in this flat, 2D view). Also available is an optional 3D perspective view so you can assess the 3D results of adding or editing control points.

If the manifold object represents a single planar surface (such as a planar vertical cross-section), then four accurate 3D control points near the corners of the object (defining two triangles) is sufficient for correct perspective viewing. For more complex manifold surfaces (multiple planes or curving surfaces) with many more control points, the Georeference Input View window provides tools that let you edit the triangulation (see the Technical Guide entitled *Georeference: Editing Manifold Surface Triangulation* for more information).

Georeference (FlatManifolds.rvc / PalisadeSectB3) (2424)

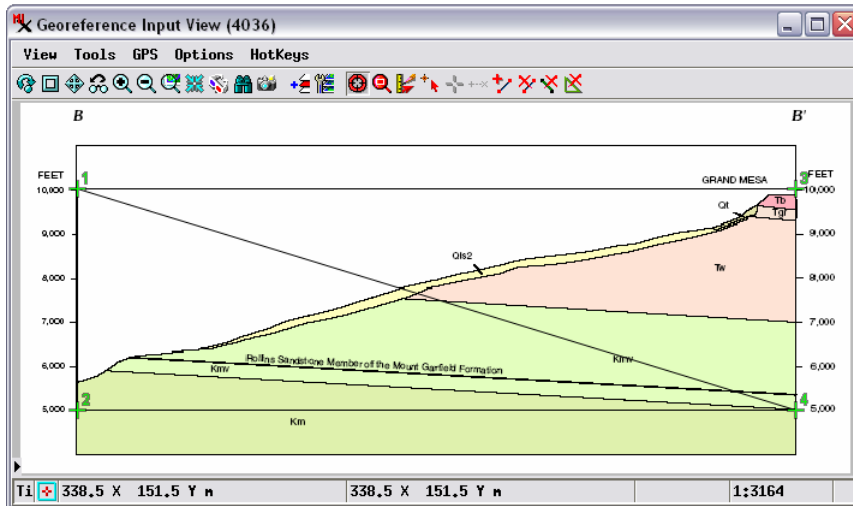
File Control Points Options Help

Model: Manifold Reference to: NAD27 / Lambert Conformal Conic

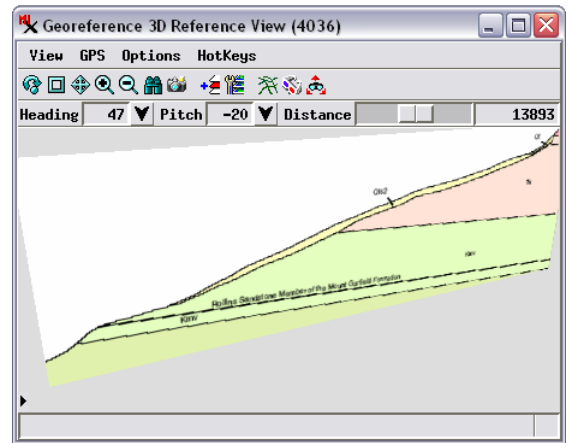
Column	Row	Easting	Northing	Elevation (m)	Residual (c)
1	46.50	71.00	-242806.00	140078.00	3048.00
2	46.50	51.00	-242806.00	140078.00	1524.00
3	633.50	71.00	-238010.00	138600.00	3048.00
4	633.50	51.00	-238010.00	138600.00	1524.00

4 Control Points
 Cell Size (meters): X = 0.0000 Y = 0.0000
 RMS Residual (cells): X = 0.00 Y = 0.00 XY = 0.00
 Mean Absolute Residual (cells): X = 0.00 Y = 0.00

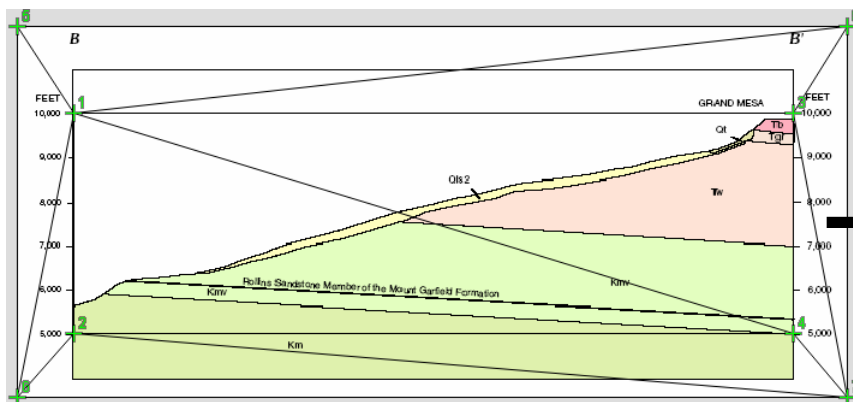
To set up manifold georeferencing for a vector or raster object, first select Manifold from the Model menu. When you add the control points, be sure to enter the correct elevation value in the Elevation field for each one. Note that you can use the Options / Units menu to choose the most convenient units (meters or feet) for input of the elevation values.



Georeference Input View (2D) of a vertical, planar, geologic cross-section (raster object) with the triangulation created from the 3D control points. Choose Show 3D Reference View from the Options menu on the Georeference window to open a 3D perspective view of the manifold (shown to the right).



In the 3D window you can view the manifold in Solid mode (as shown above) or in wireframe mode (which shows a perspective view of only the triangulation). In Solid view only the part of the manifold object inside the boundary of the control point triangulation is rendered to the screen. (This is true for 3D views of manifolds in any TNT process.)



If parts of the manifold that you wish to view in solid mode lie outside the limits of your control points, you can use the Extrapolate Boundary Control Points operation (selected from the Control Points menu on the Georeference window) to automatically create extrapolated points at the corners of the object (points 5, 6, 7, and 8 in 2D view above left). The coordinates of each extrapolated point are computed to lie in the plane of the nearest triangle. A 3D view of the manifold with extrapolated corner control points is shown above right.