# Controlling Curvature When Warping Vectors

When you reproject vector or CAD objects, lines that are straight in the starting projection may need to be curved in the output projection in order to maintain accurate positioning. You can now reproject these objects with increased accuracy thanks to the new line densification feature in the Vector / CAD Warping process (Process / Vector / Warp... and Process / CAD / Warp...). The new feature automatically inserts additional vertices in the reprojected lines to provide the required curvature.

You can control the map accuracy and complexity of the reprojected lines by changing the Line Densification Accuracy value, which sets the maximum allowed deviation between any segment of the reprojected line and its computed location in the new projection. The default value is 10 meters. Smaller accuracy values result in more line vertices, producing a better match to the projected location at the expense of a greater stored size for the vector object. In practice, the deviation between lines warped with different accuracy settings is much less than the difference in their accuracy values. The greatest visual impact of the line densification feature is seen when you warp simplified vector objects with few line vertices, such as the state outline shown below.
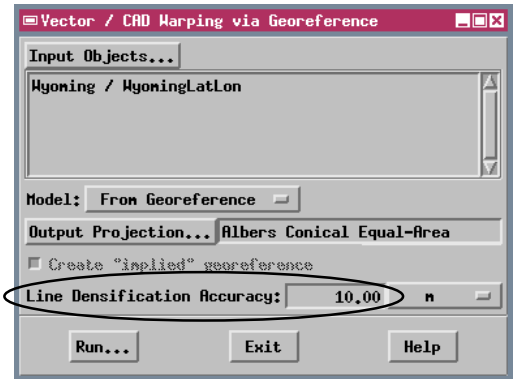
1000 meter accuracy (45 line vertices)
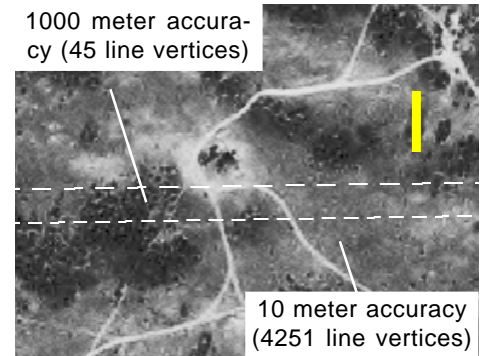
10 meter accuracy (4251 line vertices)

Vector outline of the state of Wyoming in Latitude / Longitude coordinates. Line vertices occur only at the corners of the rectangle. The length of the northern boundary line is 605 kilometers.

Wyoming outline warped to Albers Conic Equal-Area projection. The Vector Warp operation inserted numerous intermediate vertices into the northern and southern boundary lines so they curve to match the projected positions to the desired accuracy.

Close-up of the movement in part of the northern Wyoming border line warped with different densification accuracies and displayed over a Digital Orthophoto Quad image. The vertical yellow bar is 50 meters long. The maximum deviation between these warped lines is about 32 meters.