Auto-Register SPOT 5 Image
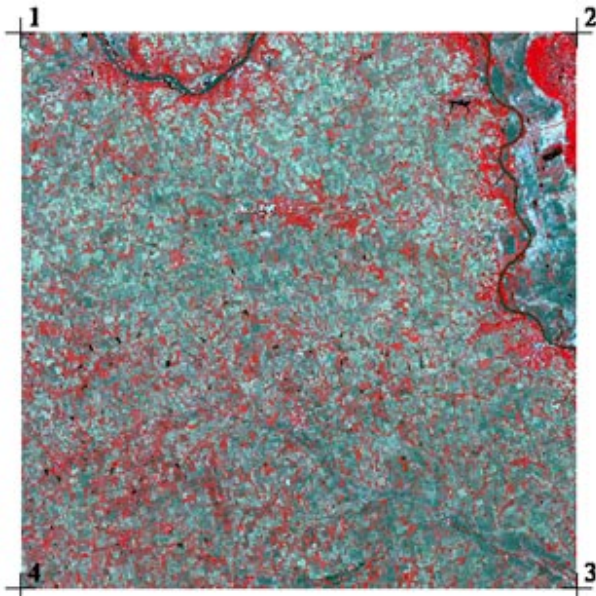

Original Georeference

After Auto-Register

Input Image: SPOT 5 image (4 bands) acquired during the 2009 growing season over an area in southeast Nebraska, displayed with three bands to produce a color-infrared image. The image is 6,000 columns by 6000 lines with a cell size of 10.2 meters. The four corner control points produced from the georeference supplied with the image yield RMS residuals X = 11.46 cells, Y = 1.53 cells, XY = 11.46 cells using the Affine model.

Reference Image: mosaic of USDA NAIP 2009 natural color orthoimagery. The yellow box shows the area covered by the SPOT 5 scene. The inset shows the southwest corner of the SPOT scene overlaid on the reference image with nominal georeference (top) and after Auto-Register (bottom). The arrows in the upper image point to mismatches of section-line roads along the boundary of the two images due to poor georeference supplied with the SPOT scene. The yellow bars indicate the mismatch distances in the east-west and north-south directions. Features in this area of the SPOT scene are offset by 200 to 300 meters (20 to 30 input image cells) from their correct locations. These features register to within 1 SPOT image cell after Auto-Register.
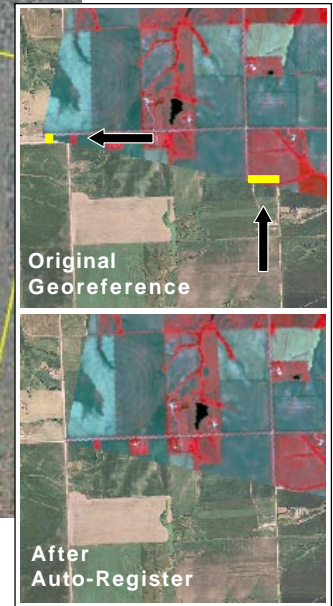
Auto-Register Result
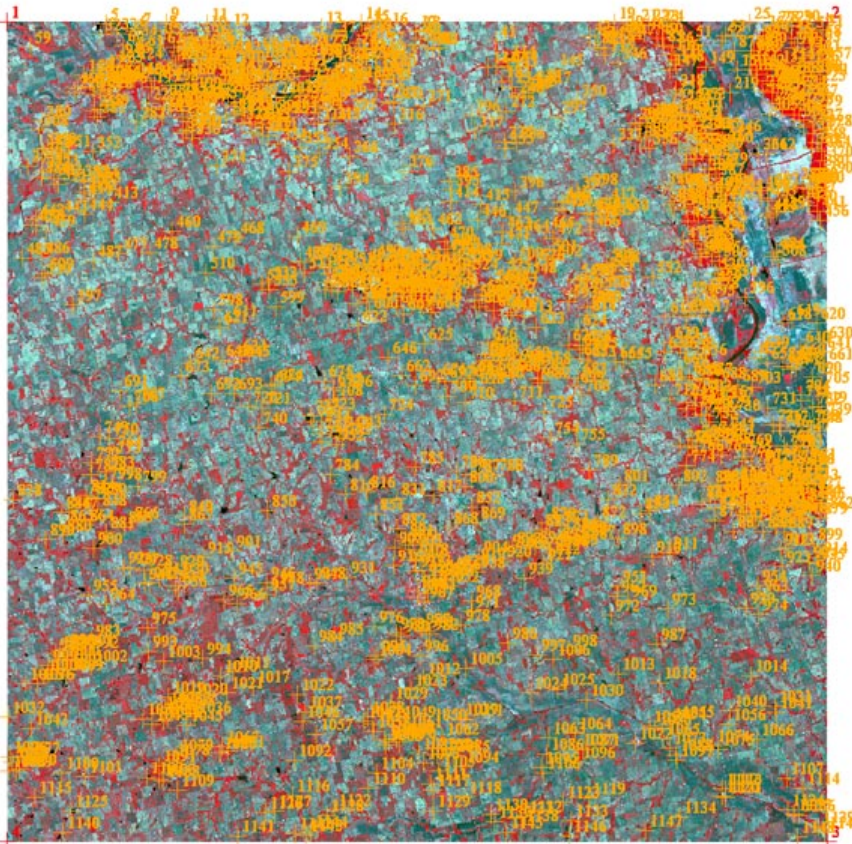
Auto-Register Settings:
Match green spectral component in each RGB image:
 Input Display "Blue" --> Reference Display "Green"
Initial Accuracy Estimate: 20 cells
Generated Point Spacing: 75 cells
Maximum Point Residual: 1.0 cell
Correlation Patch Size: 128
Maximum Adaptive Model: Order 2 Polynomial

Auto-Register produced 1145 control points

Using smaller Generated Point Spacing and/or larger Maximum Point Residual values would produce more control points.

Auto-register compared residuals using different models and found a significant improvement using the Order 2 Polynomial model, which was set for the output points.

RMS Residuals:
X = 0.41 cells, Y = 0.39 cells, XY = 0.56 cells
(Model = Order 2 Polynomial)

Mean Absolute Residuals:
X = 0.33 cells, Y = 0.29 cells