Homework 5 – Image Rectification with 2D Polynomials

Assigned Wednesday, 8 March, due Friday, 24 March

1. Produce a rectified image map using EROS image 81, on the UTM zone 16 projection, with GSD of 5m using results of either your 6 or 12 parameter transformation (you choose). Use the downsampled image: 81_5m.tif.
2. Invert your 6 parameter transformation to transform the image corner coordinates (line, sample) into E,N to establish the limits or extent of the map. Choose "round" numbers for the E min, max and the N min,max.
3. Make two versions of the rectified image, one with nearest neighbor interpolation and one with bilinear interpolation. Select one of these images to incorporate into an image map in ArcView / ArcGIS.
4. For the rectified image, create an ASCII, ESRI "world" file consisting of the following 6 numbers: GSD,0,0,-GSD,UpLeftX,UpLeftY. To go with a .tif file this world file should have same filename base with extension .tfw.
5. At this stage bring up the rectified image in ArcView / ArcGIS and visit several of the control points, read off the coordinates and verify that the errors are consistent with your transformation results.
6. Incorporate a road centerline overlay into the image map. Find Tippecanoe County Census / TIGER data at: \\pasture.ecn.purdue.edu\~caagis. If necessary project it into the above projection to be consistent with imagery.
7. Add reference grid to the map. Add title, scale bar, north arrow, projection description. Try to find some uncertainty information on the road vectors, and based on that, evaluate the registration discrepancies between visible roads and the overlaid vector data.
8. Hand in a CD with all necessary project files.