Co-registering Image Data with Erdas Imagine

1. Choose the Data Prep menu by clicking the *Data Prep* 

button in Erdas Imagine. There several useful functions for image preprocessing in this menu, choose *Image Geometric Correction* to begin the co-registration process.

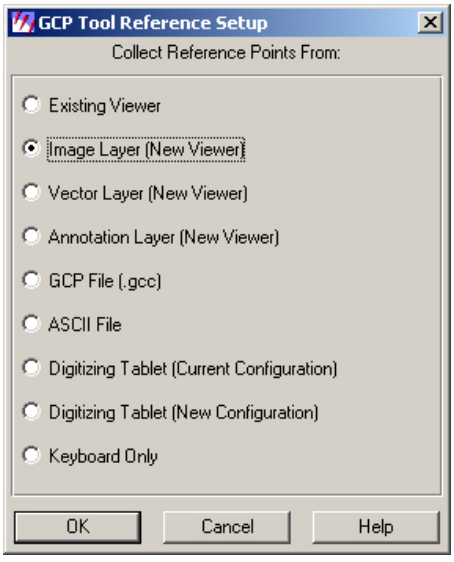
2. Select the image that is to be corrected in the *Input File* dialog by choosing *From Image File* and navigating to and selecting the image.

3. There are a number of different models that may be used to geometrically correct an image, a commonly used model is polynomial which uses polynomial coefficients to map between image spaces. Choose Polynomial to continue to the next dialog.

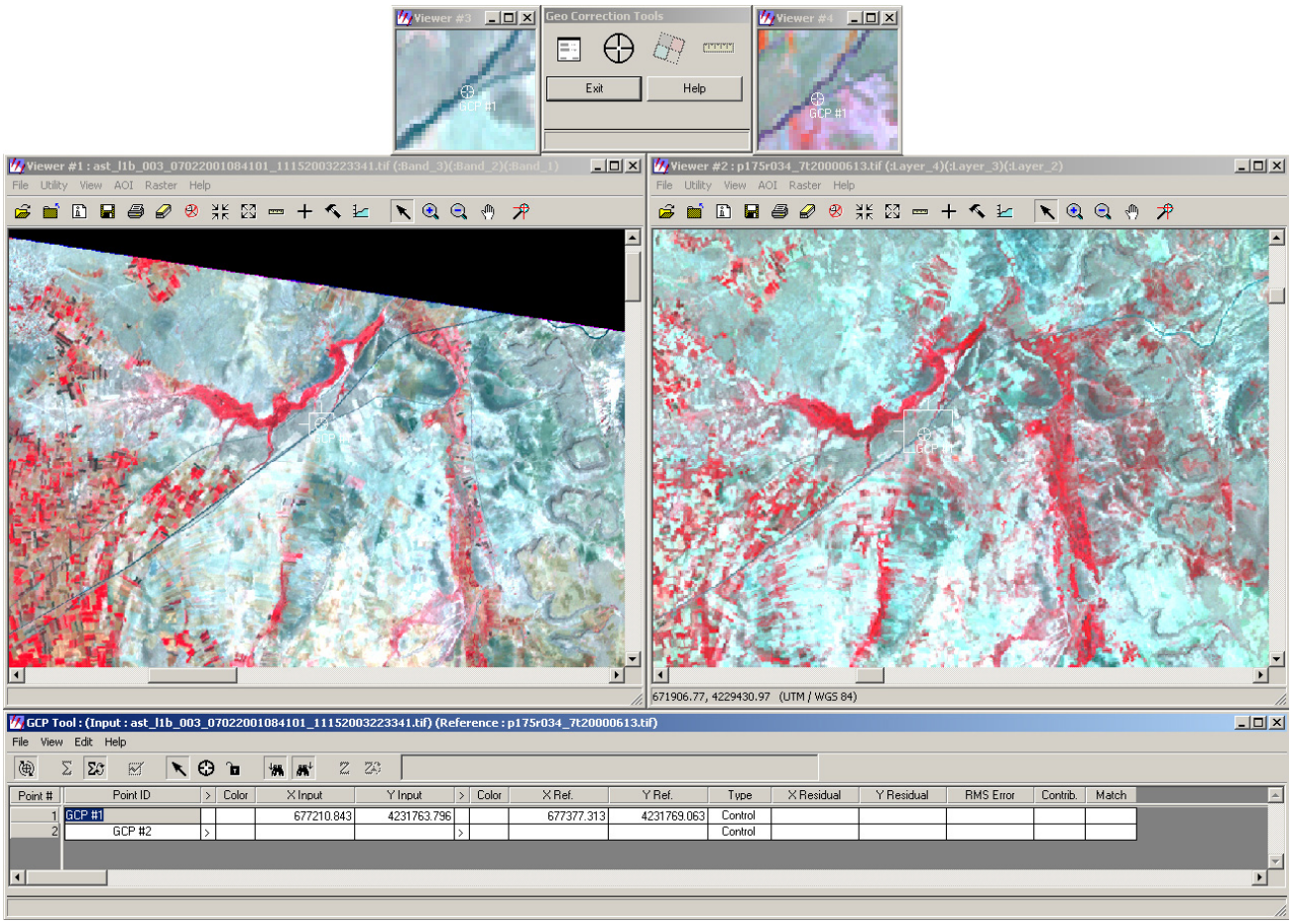
4. Set the Polynomial Order to 2 in the Parameters tab of the Polynomial Model Properties Dialog. The order number corresponds to the amount of shifting that must take place, one being the least, five being the most.

5. Set the projection by choosing the correct information in the *Add/Change Projection* button in the *Projection* tab, and set the correct map units. Click the *Close* button when finished.

6. There are a number of different types of data sources that can be used as a reference to geometrically correcting image data. To co-register the image to an existing georeferenced image, choose *Image Layer (New Viewer)* and navigate to the image file that will be used as a reference.



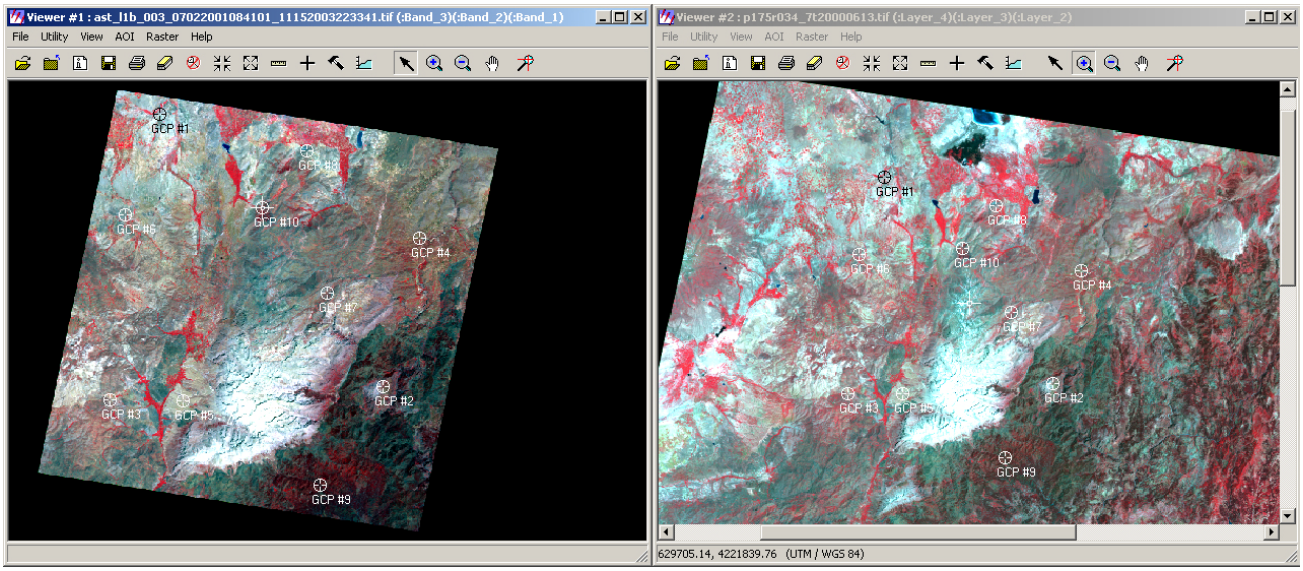
7. Once the reference image is selected, the viewers and Ground Control Point (GCP) collection menu will align on the screen. Use the zoom and pan tools to study the images. The left viewer displays the image to be corrected while the right viewer displays the reference image. The two “chip” viewers at the top of the screen are linked to the zoom boxes within the main viewers.



8. Scan the viewers and find locations that can be identified on both images. The best GCP’s are objects that do not move over time and have definitive edges such as a road crossing. Rivers are not reliable as they tend to move over time, however they may be useful in mountainous areas that are sharply defined, leaving no room for movement.

To collect a GCP, click the small *Create GCP* button within the GCP Tool Menu at the bottom of the screen. Then click the left mouse button at the location selected location in the input image. Follow the same procedure to mark the GCP in the reference image.

9. Follow the same procedure, as described in the previous step, to continue to collect GCP's throughout the image. Be sure to space the points collected throughout the entire image, and be sure to collect points at low, medium, and high elevations. Depending on the complexity of the images, it is usually sufficient to collect 9-12 points.



10. Note the Root Mean Square (RMS) error for each point in the GCP Tool menu to examine the accuracy of each GCP match. A good goal is to have a total RMS error of less than half a pixel (15 for a Landsat image).

11. Once the GCP collection is complete, save both the input and reference GCP values using the *Save As…* function in the File drop down menu. Then choose the Resample  button at the top of the screen to create the new geometrically adjusted image. Choose a location and name for the image, a resample method (nearest neighbor for satellite imagery), the desired output cell size, and choose the *ignore zero in stats* check box. Click OK to run the process.

12. To compare the resulting image to the reference image, refer to the *Loading multiple images for comparison in Erdas Imagine* quick-start guide.