GEOREFERENCING IMAGES IN ARCMAP 10

Procedure:

This procedure outlines the steps necessary to georeference an image, including air photos or raster copies of scanned paper maps. In this example we will be using a scanned Fire Insurance Plan Index Map.

Note: If the files are going to be used in future projects it is imperative to use a high-quality resolution image. If the images will simply be used to vectorize the information, the resolution is less important.

1. Open ArcMap and add the layers (roads, air photos, etc.) from which you will be using to georeference your images with the “Add Data” option. Load the image to be georeferenced like you would any other layer using the “Add Data” Option.

2. You will notice that your layer does not overlay on top of your GIS layers. In order to georeference the image, you need to overlay it on top of your GIS data.

3. To overlay the image you must first turn on the Georeferencing and Effects toolbars. Click on the Customize Menu > Toolbars > Check Georeferencing and Effects Options.

4. Using the Georeferencing toolbar select the image you would like to georeference with the “Layer” drop-down.

5. Select “Auto Adjust” and Click “Fit to Display”.

6. Your image should now appear above your GIS data.
7. Using the adjust transparency option in the Effects toolbar; select a level that will enable you to view the GIS layer beneath your image.

8. Using the Georeferencing toolbar, select the “Add Control Points” option.

9. Select a control point on your image by clicking once on it (a green cross will appear). Drag the line from the green cross and find the matching spot on your GIS layer. Click on this point and a red cross will appear.
10. Continue to add control points until your image moves into place geographically.  
11. The image below has moved into place with only three control points, but several more are recommended for better accuracy.

12. If you need to view, edit or delete your control points click the “View Link Table” button [ ] on the Georeferencing toolbar.
Each line in the Link Table represents a control point and can be edited by highlighting the desired coordinate. You can also delete a control point by simply selecting the row and clicking the delete key.

13. Once your image has moved to the location where you want it to be, you must rectify… your image to "warp" it permanently into this location. By adding the control points to the original image, we are only temporarily creating this view of it. Warping it creates a duplicate of what you see on the screen and allows you to use that duplicate in any GIS. To warp the image, select "Rectify..." from the Georeferencing task bar.

14. In the next dialog you must select a “Resample Type” for your image, All three result in some resolution loss, but the **Cubic Convolution** option seems to lose the least.

15. Click on the folder button to give your image a name, location and format.

16. Once your new images have been created, you can use them the same way you use other GIS data.

Adapted from The University of Toronto Map and Data Library Helpsheet – Georeferencing Images [http://mdl.library.utoronto.ca/geographic-information-systems-gis/geographic-information-systems-helpsheets](http://mdl.library.utoronto.ca/geographic-information-systems-gis/geographic-information-systems-helpsheets)