


## Georeferencing a raster dataset

1. Start ArcMap.
2. Add the layers residing in map coordinates and the raster dataset you want to georeference. Adding the data with the map coordinate system first is a good workflow, so that you do not need to set the data frame coordinate system.
3. In the table of contents, right-click a target layer (the referenced dataset) and click Zoom to Layer.
4. From the Georeferencing toolbar, click the Layer drop-down arrow and click the raster layer you want to georeference.

*See the end of the document for images of the Georeferencing toolbar and the buttons/functions.*

5. Click Georeferencing and click Fit To Display.

This will display the raster dataset in the same area as the target layers. You can also use the Shift and Rotate tools to move the raster dataset as needed. To see all the datasets, you can adjust their order in the table of contents.

6. Click the Add Control Points tool  to add control points.
7. To add a link, click a known location on the raster dataset and click a known location on the data in map coordinates (the referenced data).

You can also add your links in a Magnification window. When working with two raster datasets, you can open the Effects toolbar and adjust the transparency or turn layers on and off in the table of contents to view each image as you add your links.

8. Add enough links for the type of transformation.

You need a minimum of 3 links for a spline or first-order polynomial, 6 links for a second-order polynomial, and 10 links for a third-order polynomial.

9. Click the View Link Table button  to evaluate the transformation.

You can examine the residual error for each link and the RMS error. If you're satisfied with the registration, you can stop entering links.

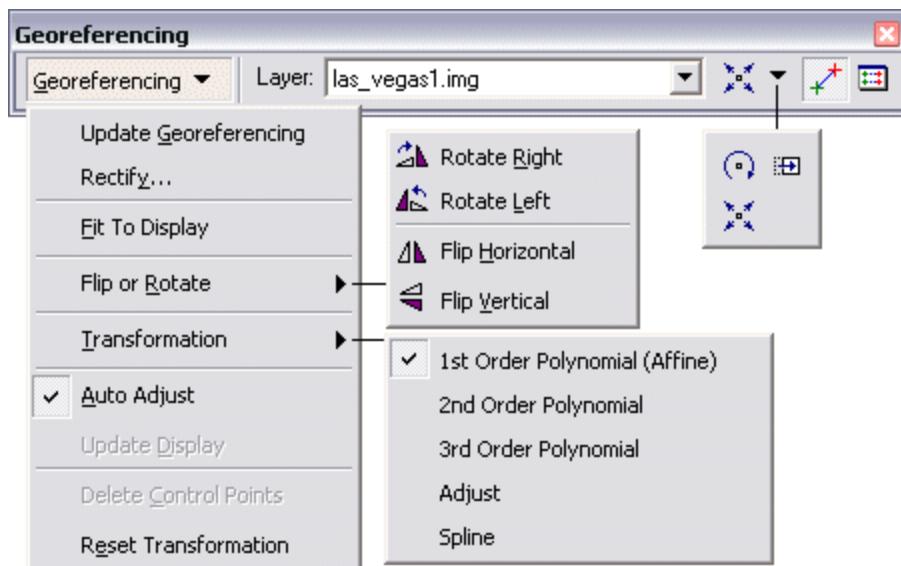
10. Click Georeferencing and click Update Georeferencing to save the transformation information with the raster dataset.

This creates a new file with the same name as the raster dataset but with an .aux.xml file extension. It also creates a world file for some of the file formats, including .tif and .img files.






## Tips

- Add the data with the existing coordinate system first, so that you do not have to set the data frame coordinate system.
- To display the Georeferencing toolbar, click the View menu, point to Toolbars, then click Georeferencing.
- You can look for road intersections, land features, building corners, or other identifiable objects and match them in your raster dataset and aligned datasets.
- You can delete an unwanted link from the Link Table dialog box.
- Press Esc to remove a link while you're in the middle of creating it.
- The Rotate and Shift tools are not available after you place the first link.
- You can permanently transform your raster dataset after georeferencing by using the Rectify command; click Georeferencing and click Rectify or use the Warp tool.
- To align your image in the same space as the data in the data frame, click the Georeferencing drop-down menu and click Fit to Display.

## The Georeferencing Toolbar



The Georeferencing Toolbar

Button	Name	Function
	Rotate	Rotates the source layer.
	Shift	Shifts the source layer.
	Scale	Rescales the source layer.
	Add Control Points	Allows you to select control points from a layer and add them to the map.
	View Link Table	Shows links and errors in tabular form.

**Source:**  
**ESRI ArcGIS S 9.3.1 Help**