Technical Appendix D
Preparing Raster Imagery in ArcGIS for AEJEE
(ArcExplorer Java Education Edition – for Mac/Win)

To use projections in an AEJEE map with raster file imagery, you must assign projection information to the raster imagery you wish to use. Unlike ArcMap or ArcCatalog .aux files or world files for JPEGS or other raster formats. AEJEE relies on "PRJ files" like those used by shapefiles. Until version 2.3, GeoTIFF header tags were not recognized but now are.

AEJEE also has performance limitations with large raster images. We suggest using pixel dimensions of 2500 or less (in either direction) and using JPEG or PNG-24 compressed format. While PNG has the advantage of supporting transparency, be aware that PNG format exported from ArcMap often alters image color values significantly.

Performance is adversely affected when AEJEE needs to re-project raster imagery. We suggest pre-processing imagery to the projection that you will use in AEJEE. However, we also suggest using WGS_84 exclusively as the datum for your work in AEJEE if you intend to save your projects. This is because upon reopening a saved map in AEJEE, the datum is automatically reset to WGS_84 regardless of the datum it was saved with. This can cause long delays in opening a map as AEJEE re-projects your raster images. This is a known bug (CQ00308198) in AEJEE and one would expect that it will be subject to change in future versions. Vector data re-projects quickly and is not a factor in this discussion.

[Most of these issues can be avoided if ArcIMS image services are used in AEJEE rather than local raster files. However, in many cases that is not an option as it requires a well-formed and highly available ArcIMS image service and user access to the Internet.]

This is the protocol we are currently using with ArcGIS 9.2:

A. Checking Native projection
    1. Open ArcCatalog
    2. Right-click image icon in the "Catalog Tree" (use the "Window" menu to open the Catalog Tree if it is not visible)
    3. Scroll-down to check "Spatial reference" and datum to confirm (if no spatial reference is defined additional steps are required – see "*defining spatial reference"* below.)

B. Re-project the raster image
   1. Open the "ArcToolbox" panel (use the "Window" menu or toolbox icon).
   2. Expand "Data Management Tools/Projections and Transformations/Raster"
   3. Double-click "Project"
   4. Set "Input raster" (input coordinate system should auto-fill)
   5. Set "Output raster" note the comments in the Help panel. You must specify an extension or the output will default to a GRID format. We suggest .tif
   6. Set "Output coordinate system." For example, to set UTM_6N_WGS84, use the "Select" button, and then double-click on Projected Coordinate Systems/UTM/WGS 1984/WGS 1984 UTM Zone 6N.prj. Click "Apply" and click "OK"
   7. If you are moving from one datum to another, you will need to pick a transformation method [see list at end of this document].
   8. Choose "CUBIC" for the resembling technique for smoother feature representation in the imagery.
   9. We suggest leaving the Output cell size at the default setting.
   10. Click "OK" to start the processing.

C. Convert the new GeoTIFF to a JPEG
   1. Open ArcMap
   2. Add the new GeoTIFF to a blank map. Allow pyramids to be made, though AEJEE may not use them. If the projection worked, you should get no errors and you should see the units of measurement (e.g. "Meters" or "Degrees") in the lower right corner of the map where cursor coordinates are reported.
   3. If necessary, adjust contrast of the image using the "Symbology" properties of the image layer (right-click the layer name and select "properties").
   4. From the "File" menu, select "Export Map…"
   5. Choose an output location.
   6. Enter a file name
   7. Select a file type (there are 10 options), we recommend JPEG
   8. Enter a resolution (we recommend at least 200 dpi) but let Width and Height guide your choice of resolution since the size of your map also influences the number of pixels. We recommend arranging less than 2,500 pixels as the longest dimension.
   9. Select the "Write World File" option for possible future.
   10. Click the "Save" button.

D. Assigning Spatial Reference Info
   1. Open ArcCatalog
   2. Right-click image icon in the "Catalog Tree" (use the "Window" menu to open the Catalog Tree if it is not visible)
   3. Scroll-down to check "Spatial reference" and datum to confirm. If no spatial reference is defined, click on the "Edit…" button and use the "Select…" button to navigate to the projection file you need. For example, to set UTM_6N_WGS84, use the "Select" button, and then double-click on Projected Coordinate Systems/UTM/WGS 1984/WGS 1984 UTM Zone 6N.prj. Click "Apply" and click "OK". Then repeat "Apply" and "OK".
   4. Now ArcCatalog and ArcMap will recognize the spatial reference info. However, for AEJEE, you need to make a .PRJ file to match the new projection. Do this in Windows Explorer.
   5. Navigate to a copy of the correct PRJ file (on most systems this will be here: C:\Program Files\ArcGIS\Coordinate Systems\Projected Coordinate Systems\UTM\WGS 1984\
   6. Highlight the correct PRJ file, right-click and select "Copy"
   7. Navigate to the directory containing your newly created JPEG or other file from Step "C" above and paste the PRJ file (right-click, Paste).
   8. Change the name of the PRJ file to match (exactly) the name of your image file but keep the extension .prj [It is not a bad idea to keep a copy of the original PRJ file in the directory for future reference].

*Most Common Alaska Datum Transformations

NAD_1927_To_WGS_1984_7	1176	Alaska
NAD_1927_To_WGS_1984_21	1249	Alaska - Aleutians east of 180 E
NAD_1927_To_WGS_1984_22	1250	Alaska - Aleutians west of 180 E
NAD_1927_To_NAD_1983_Alaska	1243	Alaska
NAD_1983_To_WGS_1984_1	1188	Alaska
NAD_1983_To_WGS_1984_2	1251	Alaska - Aleutians