General Digital Image Utilities in ERDAS

These instructions show you how to use the basic utilities of stacking layers, converting vectors, and sub-setting or masking data for use in ERDAS Imagine 9.x software. The workflow outlined below is a typical one that you may need to follow when preparing/preprocessing your data for multispectral visualization and analyses:

1. Create a multiband composite of single band imagery – this is a **Layer Stack**
2. "Clip" out a smaller portion of the imagery – this is a **Subset**
3. **Convert** vector to raster (to use in the next step)
4. Extract an irregular-shaped polygon study area from the imagery – this is an alternative to subset and involves applying a **Mask**

Some handy resources:

- FieldGuide.pdf and TourGuide.pdf
  C:\Program Files\Leica Geosystems\Geospatial Imaging 9.1\help\hardcopy
- Webinars (i.e. pre-recorded web seminars)
  http://www.erdas.com/Resources/Webinars/ArchivedWebinars/tabid/175/Default.aspx
- Free Landsat data! (e.g. search the Landsat Archives for L4-5 TM)
  http://edcsns17.cr.usgs.gov/cgi-bin/EarthExplorer/phtml/EarthExplorer.phtml)

If you haven't already done so, unzip the individual TIFF files to your working directory.

ORIGINAL DATA

L5_B10.tif, L5_B20.tif, L5_B30.tif, L5_B40.tif, L5_B60.tif, L5_B70.tif,	TIFF image files of single band imagery
StudyArea.shp	a polygon shapefile of your study area

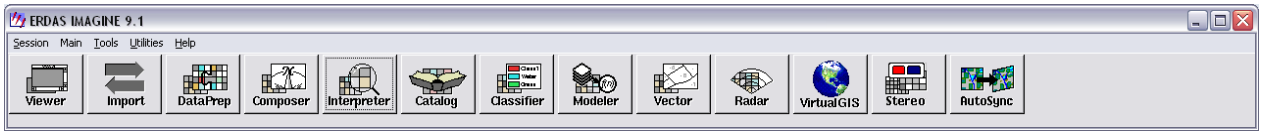
CREATED DATA

L5_all.img	ERDAS IMAGINE image file
StudyArea.img	raster of study area converted from vector polygon
L5_subset.img	image resulting from the subset tool
L5_study.img	image resulting from the mask tool

Start ERDAS with the Geospatial Light Table (GLT) Viewer:

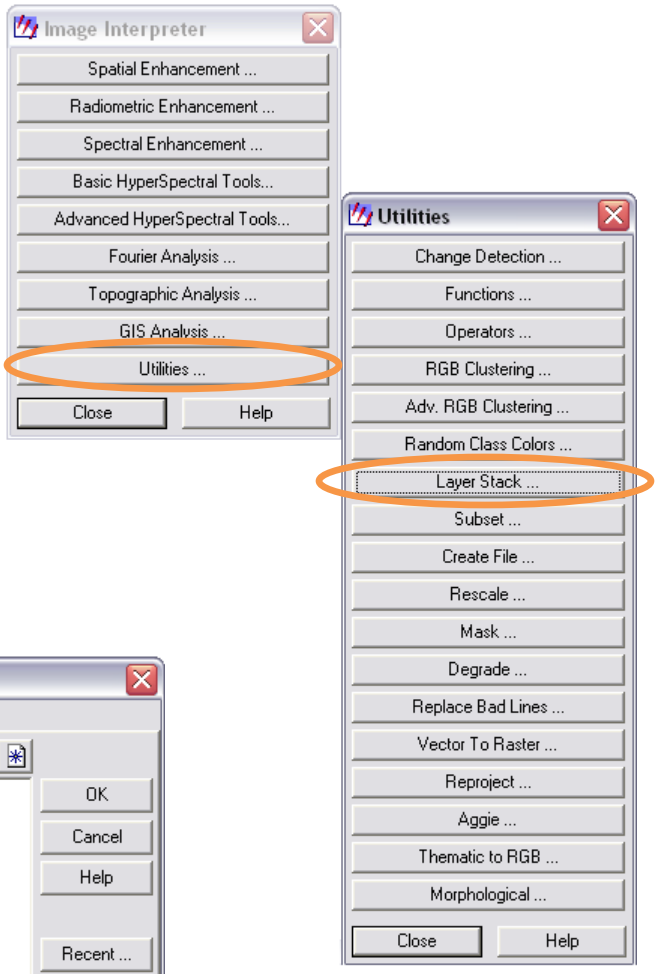
1. Click START >>> PROGRAMS >>> LEICA GEOSYSTMES >>> ERDAS IMAGINE >>> ERDAS IMAGINE
2. Select the option to use the Geospatial Light Table (GLT)

You won't actually add any data to this yet… first look for the Main Menu toolbar:



From the Main Menu bar:

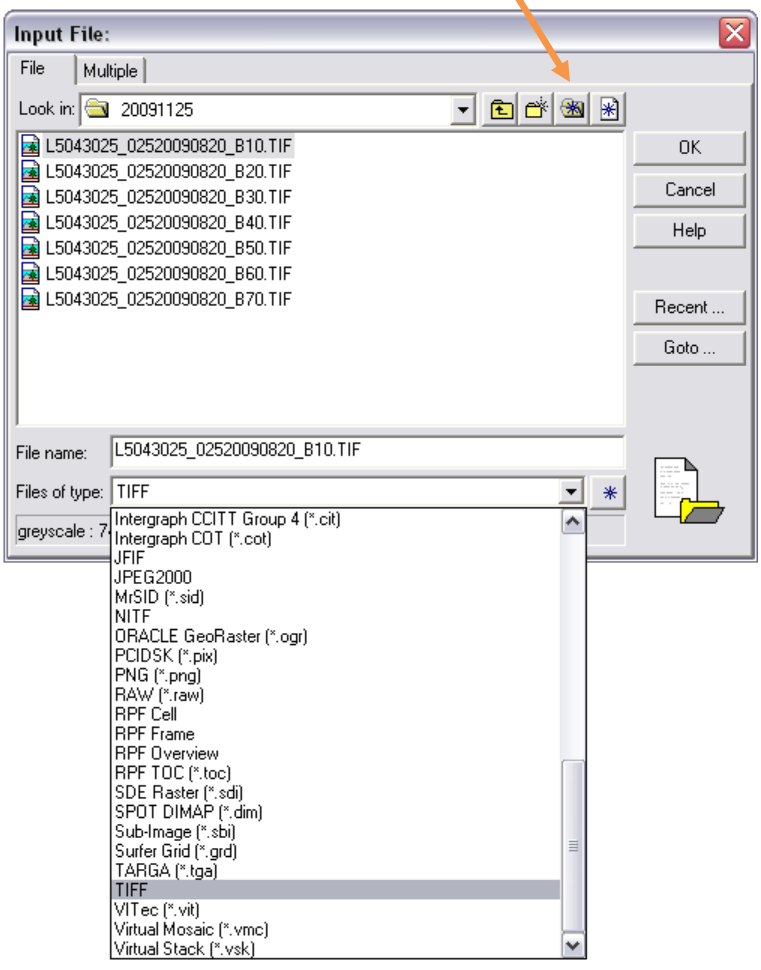
Create layer stack – a.k.a. multiband image



1. 

Click INTERPRETER >>> UTILITIES >>> LAYER STACK
2. Click the browse button (open folder icon) and navigate to the working directory of your TIFF files

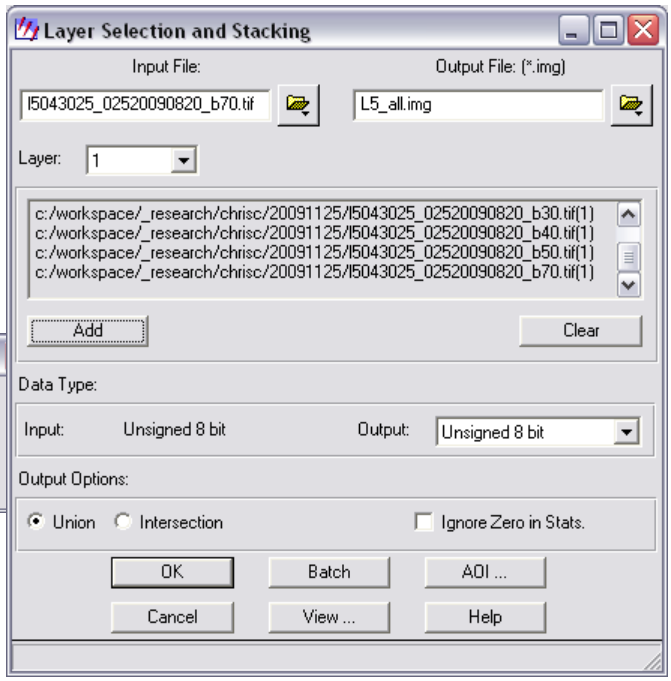
TIP: While the directory is open to your working directory, click the directory preference button (open folder with a star icon). This sets the current folder to automatically open in all other data navigation tasks.

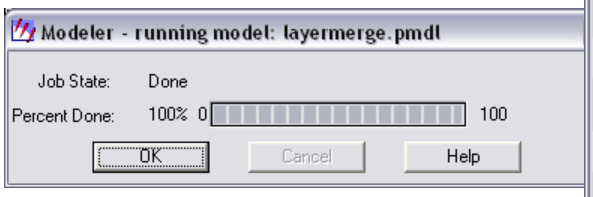


NOTE: The Recent and Goto buttons in many of the dialogs help you more efficiently locate the files or directories you commonly work.

3. In the Files of Type drop-down list, select **TIFF**
4. Select the first file (e.g. starts with L5 and ends with B10.TIF) and click OK
5. In the Layer Selection and Stacking Dialog click the ADD button
6. Repeat clicking the browse button, selecting the next TIFF file, clicking OK, and clicking ADD

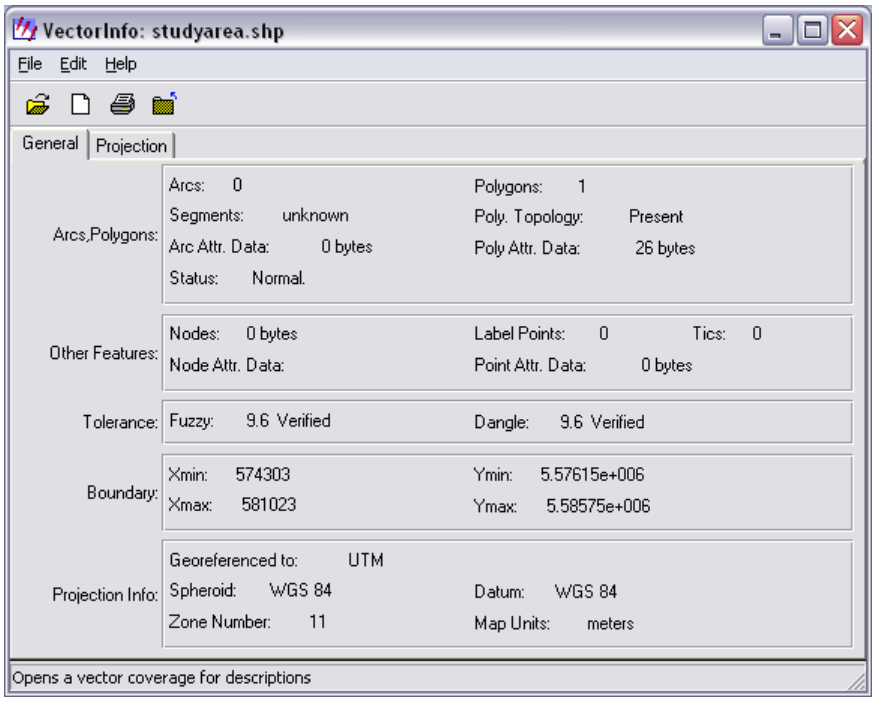
7. Do NOT add the *B60.TIF – *this thermal spectrum file has different spatial resolution than the others*
8. Name this output **L5_all.img**
9. Click OK
10. Once the job state dialog indicates 100% done, click OK





Subset to smaller rectangular portion of image

First you need to know the extent. You may use ArcMap to examine the study area shapefile layer properties. The source tab indicates the upper left and lower right corner coordinates for use in subsetting. Alternatively, use ERDAS' Vector info tool as described below:

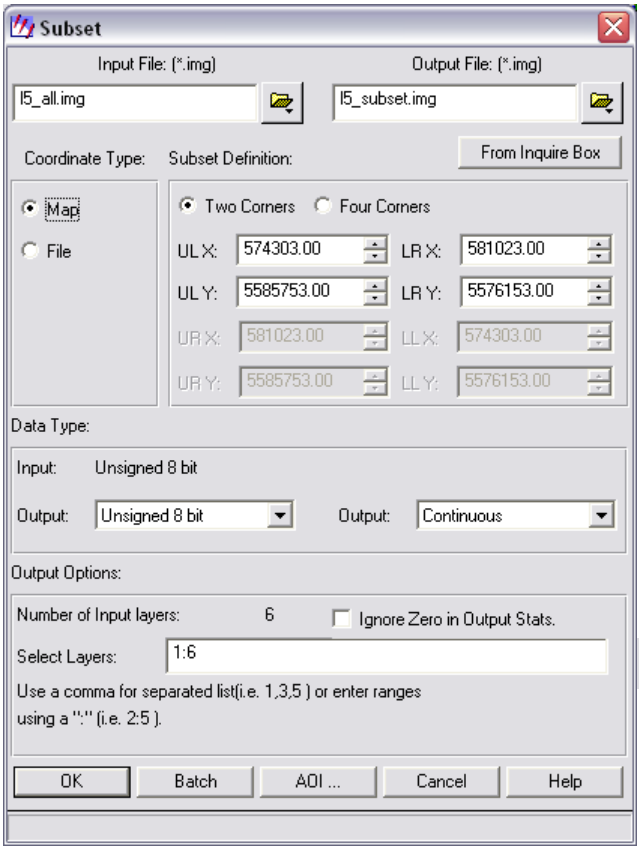


11. In the ERDAS main menu bar, choose TOOLS >>> VECTOR INFORMATION
12. Click the File Open button (open folder icon) and navigate to your working directory
13. In the Files of Type drop-down list, select ***.shp**
14. Select StudyArea.shp and click OK
15. In the Vector Info dialog, record the boundary coordinates in to a text editor (e.g. Notepad or Word)

NOTE: ArcMap layer properties source tab retains full coordinate values and conveniently allows you to copy and paste from the dialog! If you would like a dialog that allows you to copy and paste actual coordinate values, open the vector file in the Vector to Raster tool (see below for its intended use).

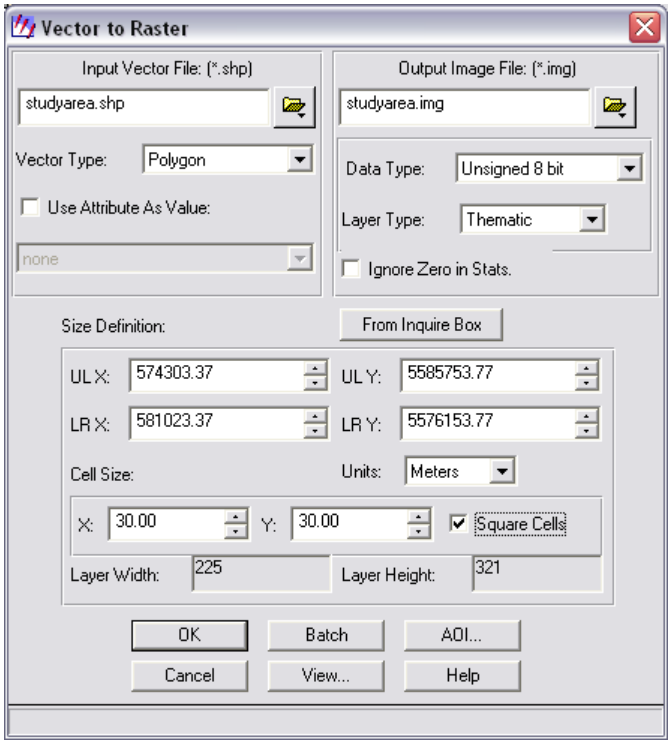
16. In the UTILITIES panel click SUBSET (i.e. INTERPRETER >>> UTILITIES >>> SUBSET)

17. Select the input file: L5_all.img
18. Name this output **L5_subset.img**
19. Define the corners:
20. UL X: 574303
21. UL Y: 5585753
22. LR X: 581023
23. LR Y: 5576153
24. Confirm all other settings – *for example, notice that you can optionally select layers and change data type*
25. Click OK
26. Once the job state dialog indicates 100% done, click OK



Convert study area vector to raster

27. In the UTILITIES panel click VECTOR TO RASTER (i.e. INTERPRETER >>> UTILITIES >>> VECTOR TO RASTER
28. Specify the input vector (in this example, use Files of Type: *.shp)



29. Set the output cell size – for fully processed Landsat data this is typically **30 x 30**

NOTE: The input vector file projection system will determine the raster units, as well as the output raster projection – in this example it is UTM meters.

Your study area vector layer must be in the same coordinate system as your imagery!!!

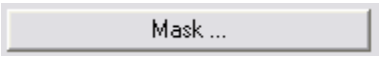
If not, project your vector data appropriately (e.g. in the GIS software) before conversion in ERDAS.

30. Name this output image file as **StudyArea.img**

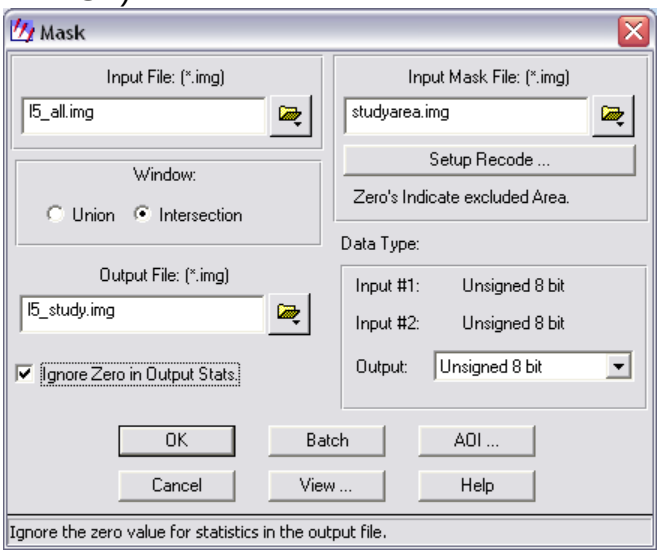
FUTURE TIP: If the vector data you convert contains attributes you need to retain, then check the 'Use Attribute As Value' box and select the name from the drop down box.

31. Click OK
32. Once the job state dialog indicates 100% done, click OK

Mask the image using the raster study area



33. In the UTILITIES panel click MASK (i.e. INTERPRETER >>> UTILITIES >>> MASK)
34. Specify the input file: L5_all.img
35. Specify the input mask file: studyarea.img
36. Choose the window default: Intersection
37. Name this output **L5_study.img**
38. Check to 'Ignore Zero in Output Stats'
39. Click OK
40. Once the job state dialog indicates 100% done, click OK

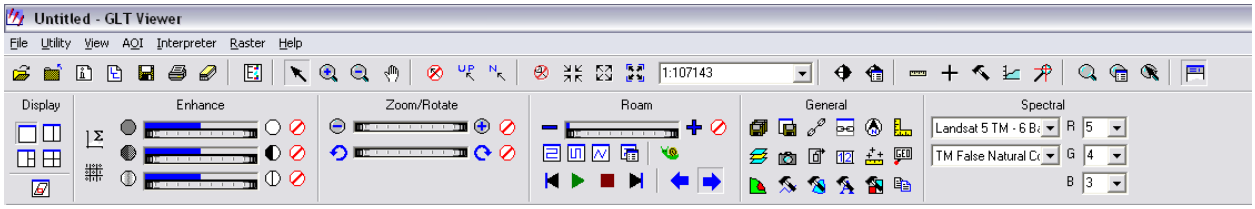


Close tool panels

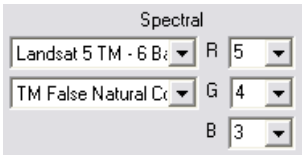
41. Click the CLOSE button on the Utilities and Image Interpreter panels when finished with them

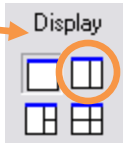
Visualize the image files:

This can be done at any time! If you want to view a single TIFF file, then substitute it for the file name below – likewise for the L5_all.img and StudyArea.img. The following shows you how to simultaneously view the subset and masked images.



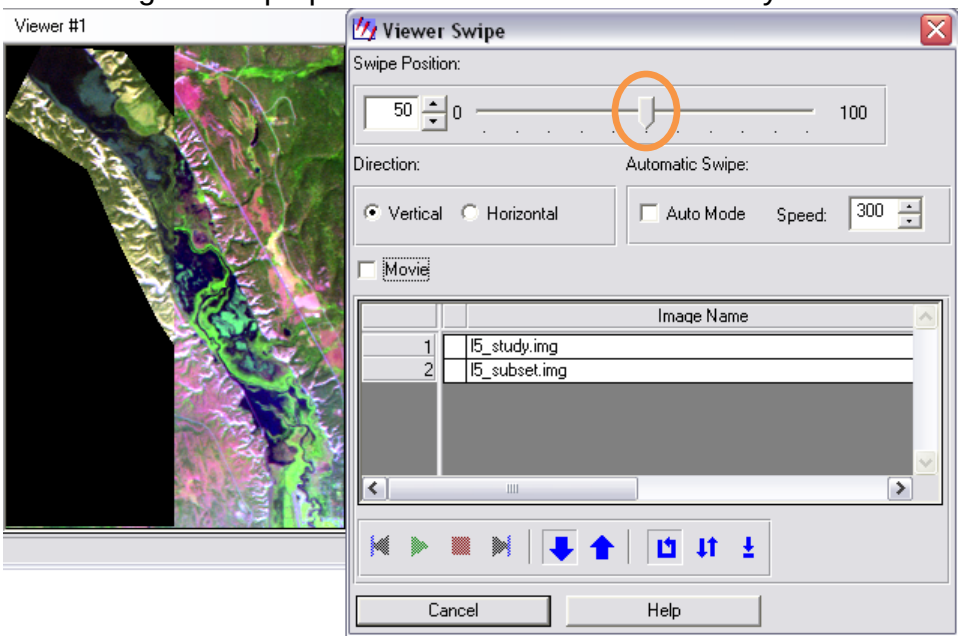
42. In the GLT Viewer interface, click the OPEN LAYER button (open folder icon) and navigate to your working directory
43. Select **L5_subset.img**
44. In the Spectral control select Landsat 5 TM and TM False Natural Color IR (try the others, too)
45. Click the Display button for 'Display Two Viewers'
46. Click the top header band of Viewer #2 to activate it – *will appear dark grey when active*
47. Click the OPEN LAYER button and navigate to your working directory
48. Select **L5_study.img**
49. In the multispectral control select TM Desert Detail 1 (or your preference)
50. Experiment with the enhance, rotate, roam, and other tools





Handy GLT file tools

1. Use the zoom and pan tools to interact with your visualization
2. Click FILE >>> SAVE >>> SAVE GLT SESSION to create a *.glt file to open in a future GLT session – *saves all the settings you have applied to your imagery*
3. Once you have an image band combination you like, click FILE >>> VIEW TO IMAGE FILE – *this creates a new *.img file from the active viewer of that specific band combination in 3-band RGB (handy for sharing with other software applications and people)*
4. Try out the image link tool… 
5. Click the Link or Unlink Two Viewers Geographically button
6. Click in the inactive viewer window
7. Now, when you zoom in/out on one image the other shows an extent rectangle
8. Click and drag the extent rectangle to pan the zoomed-in viewer
9. Try out layering and swiping… 
10. Select the Reset Windows Tools button and click and drag an image from one Viewer #2 in to Viewer #1 – this visually overlays one image layer over another
11. Right-click anywhere inside Viewer #1 and click on SWIPE (also accessible via UTILITY >>> SWIPE)
12. Click and drag the swipe position bar to reveal/hide the layer below



13. Click the check box for MOVIE and then click the PLAY button (green triangle)
14. If you close the Viewer and wish to open it again, then in the ERDAS menu bar, click MAIN >>> START IMAGINE VIEWER

Now you have several layer stacks that are GIS-ready multiband images and available as input for future image processing – calculating vegetation indices, transformations such as PCA, and unsupervised and supervised classifications. Hopefully, the ERDAS interface has become more familiar to you, too.