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) <u>http://www.erdas.com/Resources/Webinars/ArchivedWebinars/tabid/175/Default.aspx</u>
- Free Landsat data! (e.g. search the Landsat Archives for L4-5 TM) <u>http://edcsns17.cr.usgs.gov/cgi-bin/EarthExplorer/phtml/EarthExplorer.phtml</u>)

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

ORIGINAL DATA

L5_B10.tif, L5_B20.tif,	TIFF image files of single band imagery
L5_B30.tif, L5_B40.tif,	
L5_B60.tif, L5_B70.tif,	
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:

1 ERDAS IMAGINE 9.1		
Session Main Tools Utilities Help		
Viewer Import DataPrep Composer Interpreter Catalog	Cassifier Modeler Vector Radar Virtual	GIS Stereo RutoSync

From the Main Menu bar:

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



- Interpreter Click INTERPRETER >>> 1. 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.

Input Fil	le:		×
File M	1ultiple	X	
Look in: 🥳	20091125	- 🗈 💣 🕷 😣	
🛃 L5043	025_02520090820_B10.TIF		OK
L5043 🙀 L5043	025_02520090820_820.TIF 025_02520090820_830.TIF		Cancel
🛃 L5043	025_02520090820_B40.TIF		Help
L5043	025_02520090820_850.TIF 025_02520090820_860_TIF		
L5043	025_02520090820_B70.TIF		Recent
			Goto
File name:	L5043025_02520090820_B10.TIF		
Files of typ	e: TIFF	▼ *	
greyscale :	7 Intergraph CCITT Group 4 (*.cit)		
	MrSID (*.sid)		
	NITF ORACLE GeoRaster (*.ogr)		
	PCIDSK (*.pix)		
	RAW (*.raw)		
	RPF Cell BPF Frame		
	RPF Overview	_	
	RPF TOC (*.toc)		
	SPOT DIMAP (*.dim)		
	Sub-Image (*.sbi)	=	
	TARGA (*.tga)		
	TIFF		
	Virtual Mosaic (*.vmc)		
	Virtual Stack (*.vsk)	*	



💆 Image Interpreter

GIS Analysis

Utilities ..

Close

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

UofA Biological Sciences – GIS

- 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

💯 Modeler - running model: layermerge.pmdl		
Job State:	Done	
Percent Done:	100% 0 100	
	Cancel Help	

Subset to smaller rectangular portion of image

First you need to know the <u>extent</u>. 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:

💯 Layer Selection and Stacking

Input File:

-

Unsigned 8 bit

ΟK

Cancel

E

c:/workspace/_research/chrisc/20091125/I5043025_02520090820_b30.tif(1) c:/workspace/_research/chrisc/20091125/I5043025_02520090820_b40.tif(1) c:/workspace/_research/chrisc/20091125/I5043025_02520090820_b50.tif(1)

c:/workspace/_research/chrisc/20091125/I5043025_02520090820_b70.tif(1)

Batch

View.

L5_all.img

Output:

15043025_02520090820_b70.tif

Layer: 1

Add

Data Type: Input:

Output Options:

O Union C Intersection

💋 VectorInfo: s	tudyarea.shp	
<u>File E</u> dit <u>H</u> elp		
6061	1	
General Projection	1	
	Ares: 0	Polygons: 1
	Segments: unknown	Poly. Topology: Present
Arcs,Polygons:	Arc Attr. Data: 0 bytes	Poly Attr. Data: 26 bytes
	Status: Normal.	
	Nodes: 0 bytes	Label Points: 0 Tics: 0
Other Features:	Node Attr. Data:	Point Attr. Data: 0 bytes
Tolerance:	Fuzzy: 9.6 Verified	Dangle: 9.6 Verified
	Xmin: 574303	Ymin: 5.57615e+006
Boundary:	Xmax: 581023	Ymax: 5.58575e+006
	Georeferenced to: UTM	
Projection Info:	Spheroid: WGS 84	Datum: WGS 84
	Zone Number: 11	Map Units: meters
Opens a vector cove	rage for descriptions	

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).

27 November 2009

Output File: (*.img)

Unsigned 8 bit

Ignore Zero in Stats.

AOL.

Help

11. In the ERDAS main menu bar, choose TOOLS >>> VECTOR

12. Click the File Open button (open

folder icon) and navigate to your working directory 13. In the Files of Type drop-down list,

StudyArea.shp and click

boundary coordinates in to a text editor (e.g. Notepad or Word)

dialog, record the

15. In the Vector Info

INFORMATION

select *.shp 14.Select

OK

- O X

>

^

≣

v

-

Clear

UofA Biological Sciences – GIS

UUIA DIUlUyical Sciences – GIS			271	November	2003
16. In the UTILITIES panel click SUBSE	T (i.e. SUBSET)		Subse	et	
17. Select the input file: 1.5 all img	UDDET)				
18 Name this output L5 subset.img	💯 Subset				
19. Define the corners:	Input File	e: (*.img)	Uutpu	it File: (*.img)	
20. UL X: 574303	i5_aii.img	<u> </u>			<u> </u>
21.UL Y: 5585753	Coordinate Type:	Subset Definition:		From Inquire	Вох
22.LR X: 581023	G Mad	Two Corners	C Four Corners		
23.LR Y: 5576153	C File	574202.00		591022.00	_
24. Confirm all other settings – for	, rie			5570153.00	
example, notice that you can		ULY: 5080753.0		0076103.00	
optionally select layers and		UR X: 581023.0) 🚊 LL X:	574303.00	×
change data type		UR Y: 5585753.1	0 🛓 LL Y:	5576153.00	* *
25. Click OK	Data Type:				
26. Once the job state dialog indicates	Input: Unsigne	d 8 bit			
100% done, click OK	Outout: Unsigne	ed 8 bit	Output: Cont	tinuous	-
			Joon		
Convert study area vector to raster	Output Options:				
Vector To Raster	Number of Input lay	ers: 6	Ignore Zero ir	n Output Stats.	
27. In the UTILITIES panel click	Select Layers: 1:6				
VECTOR TO RASTER (i.e.	Use a comma for separated list(i.e. 1,3,5) or enter ranges using a "" (i.e. 2-5.)				
INTERPRETER >>> UTILITIES	using a . (i.e. 2.3).				
>>> VECTOR TO RASTER	ОК	Batch A0	I Canc	el He	:lp
28. Specify the input vector (in this					
example, use Files of Type: .snp)	<u> </u>	2 Sot the ou		sizo fo	 r
1/2/ Vector to Raster		orocessed I	andsat da	ata this i	c
Input Vector File: (*.shp) Output Image File: (*.img)	typic	ally 30 x 30	and at ut		5
studyarea.shp		E: The inpu	t vector fil	e proiec	tion
Vector Type: Polygon Data Type: Unsigned 8 bit	- syste	m will deter	mine the	raster u	nits,
Use Attribute As Value:	as w	ell as the ou	itput raste	er project	tion
	<mark>– in t</mark>	his example	it is UTM	1 meters	
Inone Ignore Zero in Stats.	Υοι	ur study are	ea vector	layer m	ust
Size Definition: From Inquire Box	be	in the same	e coordin	ate syst	tem
ULX 574303.37 ILX 5585753.77 I		as you	ır imager	y!!!	
	It not	, project you	ur vector o	data	
LR X: 581023.37 🔂 LR Y: 55/6153.77	appro	opriately (e.	g. in the G	SIS SOIT	vare)
Cell Size: Units: Meters		Conversion	OUTOUT IN	AS. Dogo filo	00
X: 30.00 → Y: 30.00 → Square Cells	Stud	vAroa ima	s output in	lage lile	as
1 sug 1/ (dbc 225 1 sug 1/ site 321			the vector	r data vo	
	conv	ert contains	attributes		ed to
OK Batch A0I	retair	n. then chec	k the 'Use	e Attribu	te As
Cancel View Help	Value	a' hoy and s	elect the	name fro	

ccn@ualberta.ca

the drop down box.

27 November 2009

Mask ...

Input Mask File: (*.img)

Setup Recode .

Unsigned 8 bit

Unsigned 8 bit

Zero's Indicate excluded Area.

Output: Unsigned 8 bit

AOL.

Help

D

-

studyarea.img

Data Type:

Input #1:

Input #2:

æ,

۵

Batch

View.

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

Ignore the zero value for statistics in the output file.

button on the Utilities and Image Interpreter panels when finished with them

🕖 Mask

15_all.img

15_study.img

Input File: (*.img)

Window:

Output File: (*.img)

0K

Cancel

C Union 💽 Intersection

🔽 Ignore Zero in Output Stats.

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
- grey when active 47. Click the OPEN LAYER button and navigate to your working directory

Landsat 5 TM - 6 B 🗸 🔻 🖪 5

TM False Natural C 💌 G 4 💌

- 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

-

B 3 👻

Display

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

Viewer #1	💯 Viewer Swipe	
	Swipe Position:	
	Direction:	Automatic Swipe:
	 Vertical C Horizontal 	Auto Mode Speed: 300 📩
	T Movie	
		Image Name
	1 I5_study.img	
S A B	2I5_subset.img	
	M > M > I +	t t t
	Cancel	Help

- 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.