

ENVI 5.0 Tutorial: A Quick Start to ENVI 5.0

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A Quick Start to ENVI 5.0

This Quick Start tutorial is aimed at providing a newer ENVI user with a brief introduction to the graphical user interface and basic capabilities of ENVI 5.0.

Files Used in this Tutorial:

The files used in this tutorial are the same as those used for the ENVI Classic tutorial: A Quick Start to ENVI Classic. You can download these data files from the Exelis website:

<http://www.exelisvis.com/ProductsServices/ENVI/Tutorials.aspx>

Scroll to the “A Quick Start to ENVI Classic” tutorial and click “Download Data.” The file 01_QuickStart_ENVI_Classic.zip contains the data files needed for this tutorial.

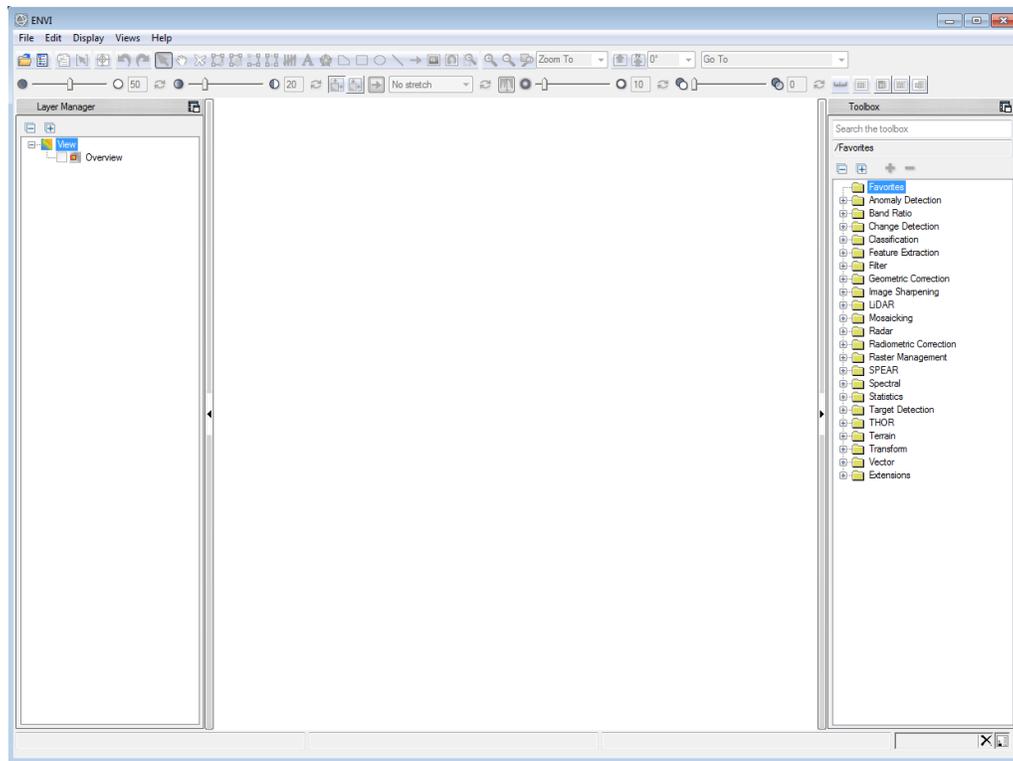
File	Description
Can_tmr.img	Cañon City, CO, TM Data
Can_tmr.hdr	ENVI header for above
Can_v1.evf	ENVI vector file 1
Can_v2.evf	ENVI vector file 2
Can_v3.evf	ENVI vector file 3
Can_v4.evf	ENVI vector file 4

Getting Started with ENVI 5.0

Ensure that ENVI 5.0 is properly installed and licensed before starting the application.

Familiarizing Yourself with the ENVI 5.0 Interface:

When ENVI 5.0 opens, the graphical user interface will be displayed. This interface contains various functionality panes which will allow you to analyze imagery and interact with the display.



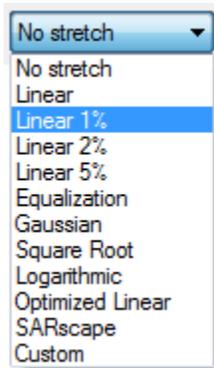
The ENVI main menu includes File, Edit, Display, Views, and Help at the top of the interface. The icon bars below contain options for opening images and interacting with the display, including zoom, image stretch, transparency, and cursor options. This area also contains icons for vector creation and editing. The three large panes are, from left to right, the Layer Manager, the display, and the Toolbox. When an image is displayed, it will be listed as a layer in the Layer Manager while the image itself will appear in the display. The Toolbox allows you to access ENVI's suite of analysis tools and is searchable by using the white search field at the top of the pane.

Opening an Image and Applying a Contrast Stretch

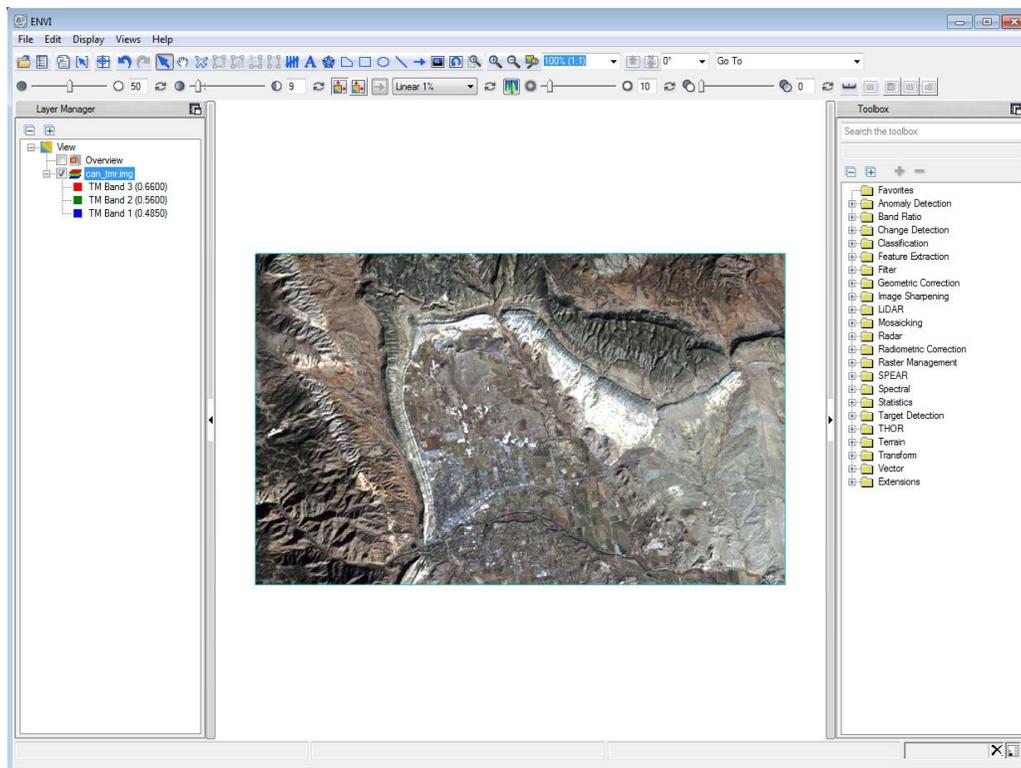
Open a multispectral Landsat Thematic Mapper (TM) data file representing Cañon City, Colorado, USA.

1. From the ENVI 5.0 main menu bar, select File > Open.
2. Navigate to your tutorial files directory and select can_tmr.img, then click Open

By default, the image will open as True Color in the display without a contrast stretch applied. To apply a stretch, click on the stretch menu and select Linear 1%.

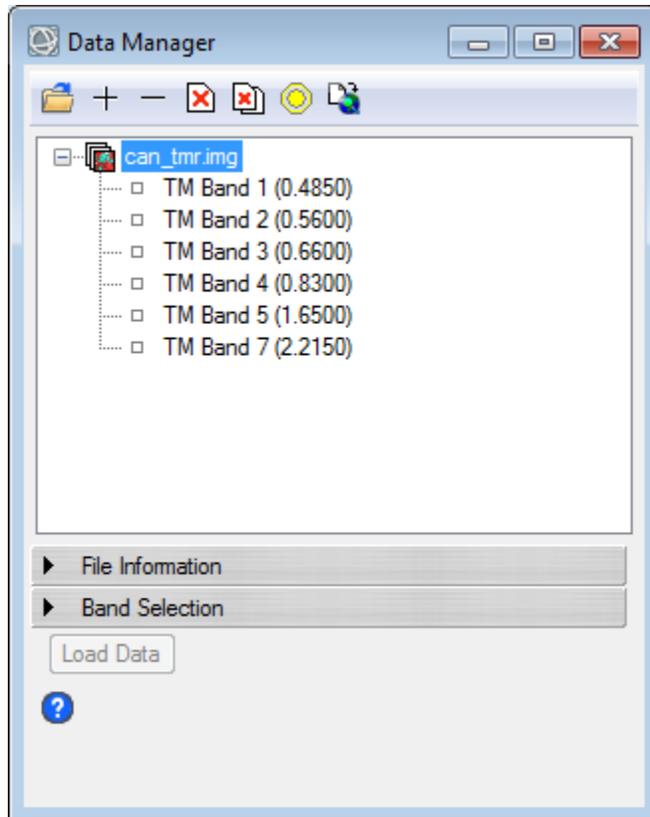


The result:



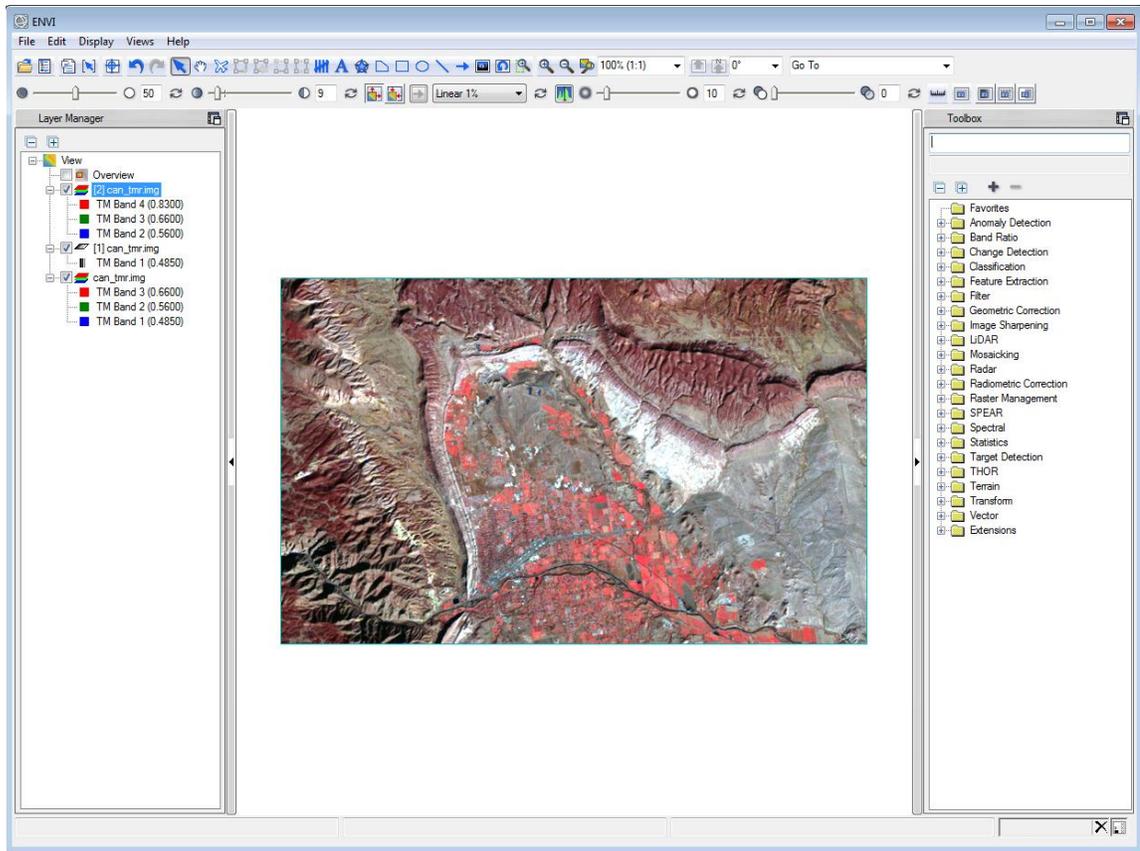
Loading an Image to the ENVI Display

1. From the ENVI main menu, select File > Data Manager. This is also available via the corresponding icon on the icon bar.

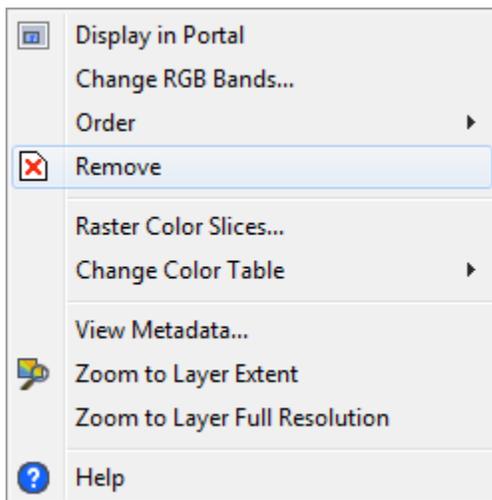


The Data Manager contains all of the bands in all of the files that are open in the current session of ENVI, even if they are not currently loaded into a layer in the display.

2. Select TM Band 4 and click Load Data. This will display Band 4 as a grayscale image in the ENVI display. You can also display the grayscale by right-clicking on Band 1 and selecting Load Grayscale. Apply a Linear 1% stretch.
3. Select in order Band 4, Band 3, then Band 2. You will notice that each band selected has a color square to its left in the Data Manager. The order in which you select the three bands you'd like to display corresponds to the color order red, green, blue. This band combination will display a color infrared image. Click Load Data. Apply a Linear 1% stretch.



All three images previously loaded are currently available in the display. However, because they are co-located, only the top layer in the Layer Manager is currently visible. You can turn layers off or on by clicking the check box next to the layer in the Layer Manager. If you wish to completely remove a layer from the display, right click on that layer in the Layer Manager and select Remove or select Edit > Remove Selected Layer from the ENVI main menu.



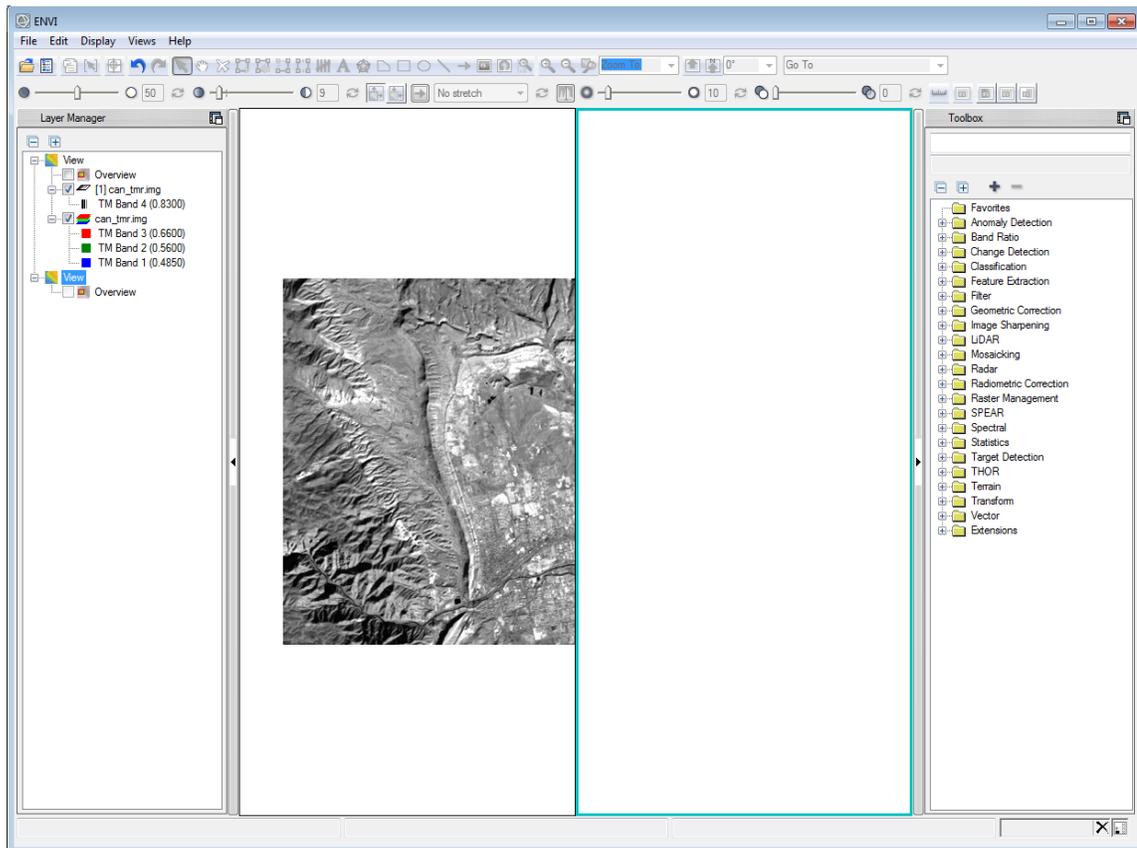
You can also change the brightness, contrast, sharpness, and transparency of the layer highlighted in the Layer Manager by using the slider controls on the lower icon bar.

4. Right-click on the color infrared layer [red=Band 4, green=Band 3, blue=Band2] in the Layer Manager and select Remove.

Opening and Linking Multiple Views

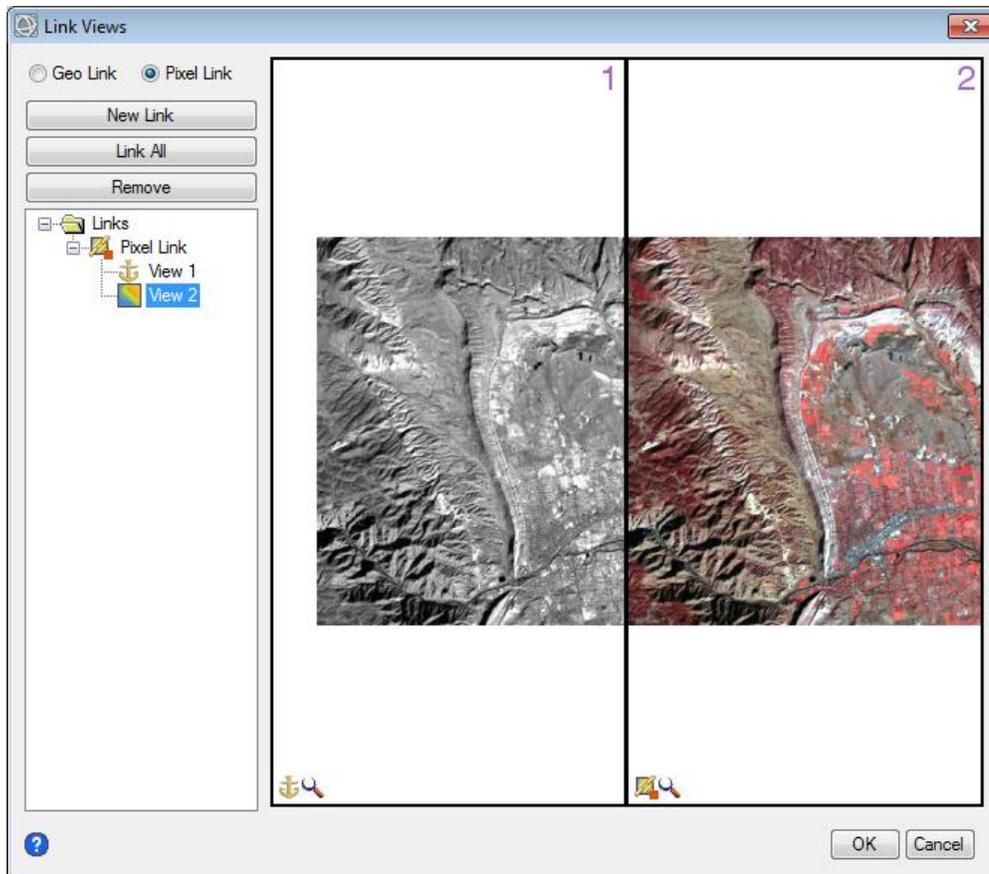
In order to view multiple images side by side rather than overlaying them, multiple views can be opened in the ENVI display.

1. Select Views > Create New View from the ENVI main menu.



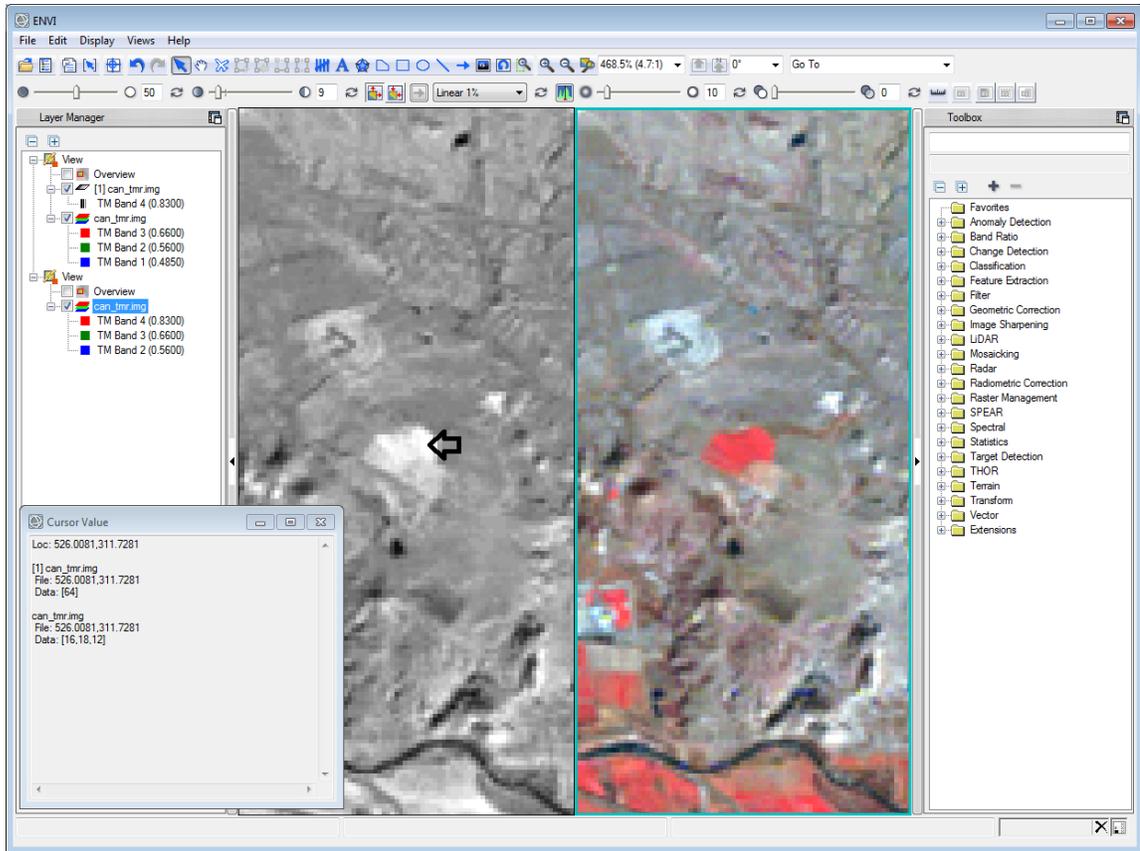
A new view is created on the right side of the display as well as in the Layer Manager. The active or selected view is highlighted in blue. Any layer loaded will be displayed in the active view.

2. In the Data Manager, right click on can_tmr.img and select Load CIR. Then apply a Linear 1% stretch.
3. From the ENVI main menu select Views > Link Views. In the dialog that opens click Link All, then OK.



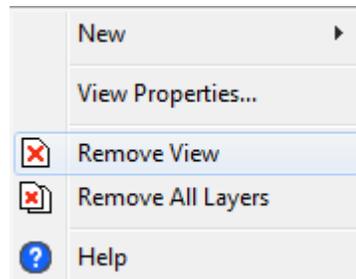
Because can_tmr is not georeferenced, Geo Link is unavailable. Pixel Link will link the images based on sample and line number. In order for this to work, images in both views must have the same number of samples and lines.

4. Back in the main ENVI display, use Pan () to move the grayscale image within its view. The CIR image moves as well and the same area is depicted in both views.
5. Use Zoom () to zoom in on a bright red area in the CIR image by clicking on the image and dragging an outline of the area. To turn Zoom off, click the Select icon (). You can see that red areas in the CIR image correspond to light or white areas in the Band 4 grayscale image.
6. Turn on Cursor Value () and hover the cursor over the white area of the grayscale image.



The cursor value dialog (here pictured at the bottom left) shows pixel values for each layer under the cursor. In this case, values for both the grayscale image and underlying true color image are displayed.

7. Close the cursor value dialog. Then close the right-hand view by right-clicking on the second View in the layer manager and selecting Remove View. Remove the RGB image from the remaining view.

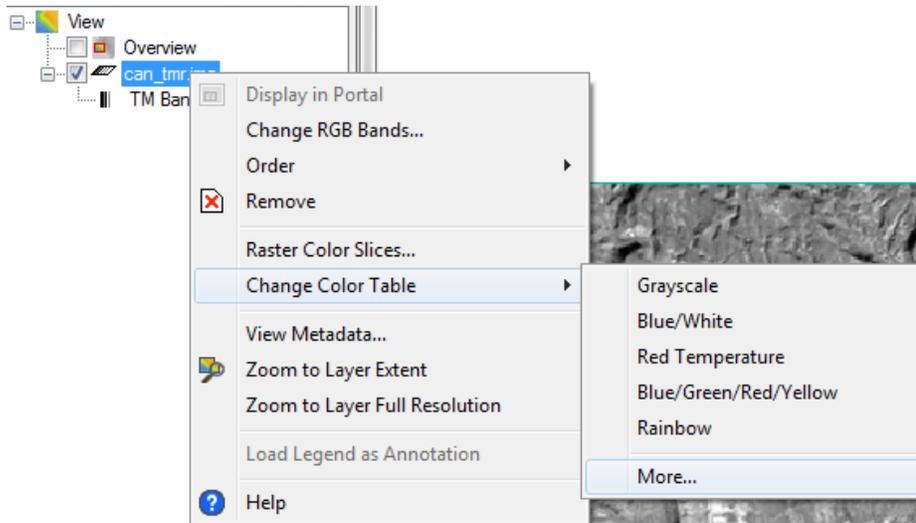


8. Right-click on the remaining grayscale image and select Zoom to Layer Extent.

Applying a Color Table

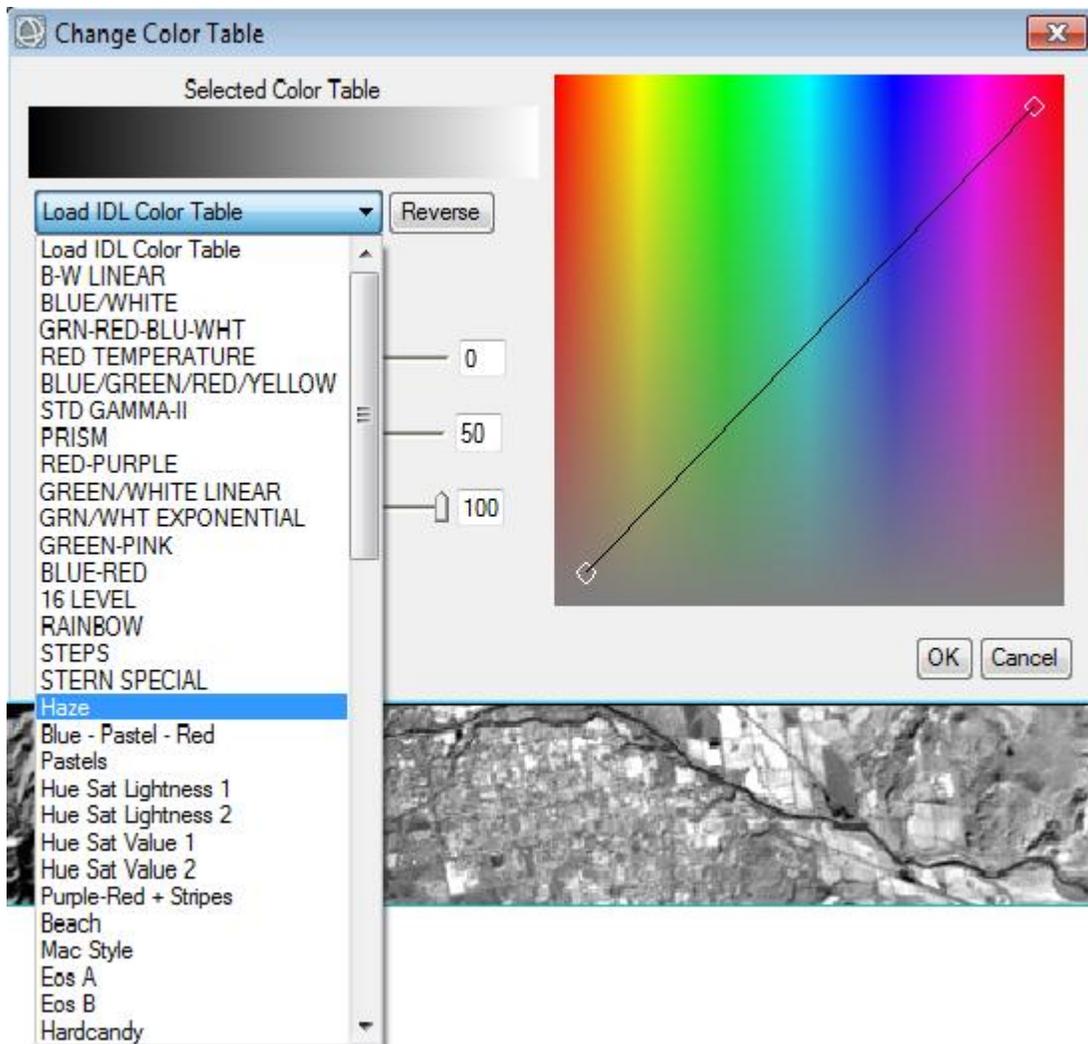
By default, ENVI displays single band images using a grayscale color table. You can apply a pre-defined color table to an image or select a color table from a list.

1. In the Layer Manager, right click on the grayscale image and select Change Color Table > More...



Some predefined color tables are available above More for your convenience.

2. An extended list of predefined color tables is available in the Load IDL Color Table drop down list. Select a color table from this list. The image in the ENVI display changes to reflect this color table and is essentially a preview. You can preview different color tables and clicking OK will accept the color table currently displayed. Clicking Cancel will cause the image in the display to revert to grayscale. Choose a color table of your liking and click OK.



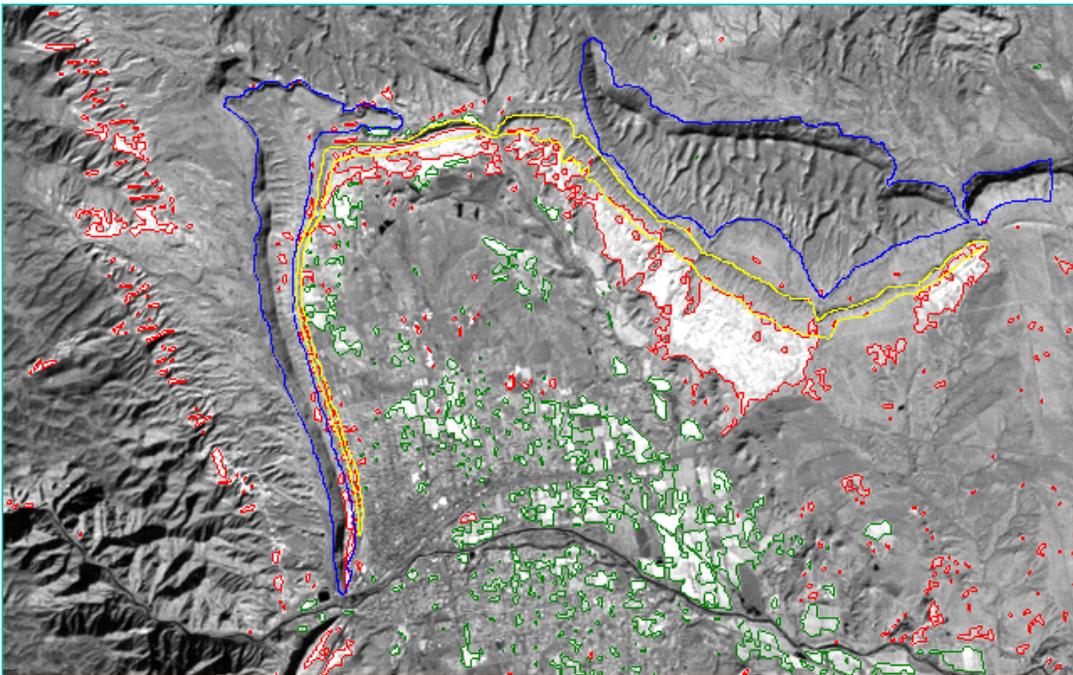
You can also define your own color table using the interactive tools in the Change Color Table dialog.

3. To remove the color table, right click on the image in the Layer Manager and select Change Color Table > Grayscale.

Overlaying and Working with Vectors

ENVI provides a full suite of vector viewing and analysis tools, including input of shapefiles, vector editing, and vector querying.

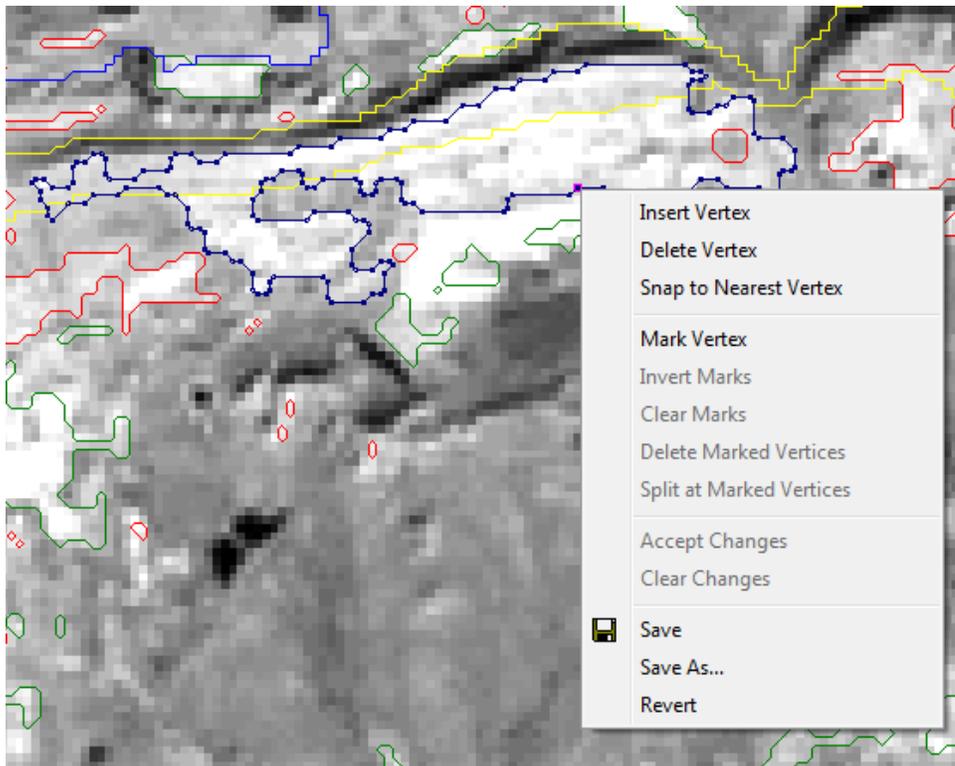
1. From the ENVI main menu bar, select File > Open or click the Open () button just below. Navigate to your tutorial files directory and select the four .evf files, then click Open. You can select multiple files by holding the Control key while you click. The vectors should display automatically.



2. Click on the arrow next to File Information in the Data Manager to display information about the vector files.
3. Right-click on a vector layer in the Layer Manager and select Properties. The dialog that opens will allow you to change the color, line style, line thickness, and fill properties of the vector layer. Close the Properties dialog.
4. The red box outline around a vector layer symbol in the Layer Manager indicates the active layer. You can change the active layer by right-clicking on another vector layer and selecting Set as Active Layer. The following steps will work only on the layer that is set as active at a given time.
5. Click the Vector Edit button () on the upper icon bar. You may wish to zoom in so that you can see the vector records more clearly. Then click on a vector record in the active layer. The

vector should be highlighted. Then right-click the selected vector to display the vector editing options such as Delete, Remove Holes, Smooth, Rectangulate, Merge, Group, and others. You can experiment with these editing options or click outside of the menu to dismiss it.

6. To edit individual vertices, click the Vertex Edit button () on the upper icon bar. Then click on a vector within the active layer. Right-click on the vertex you wish to edit to display the editing options. You can experiment with these editing options or click elsewhere in the display to dismiss the menu.



7. You can close your ENVI session by selecting File > Exit from the menu bar.