

## A Quick Start to ENVI 5

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This tutorial is designed for customers who are new to ENVI or those who have worked with ENVI Zoom and ENVI Classic in the past. This tutorial is specific to version 5; newer versions of ENVI have a similar interface but with more capabilities.

You will learn the following concepts:

- [The ENVI 5 user interface](#)
- [Display images](#)
- [Link multiple views](#)
- [Apply a color table](#)
- [Run vegetation suppression](#)

## Files Used in This Tutorial

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The files for this tutorial are located in the following folder of the ENVI installation path:

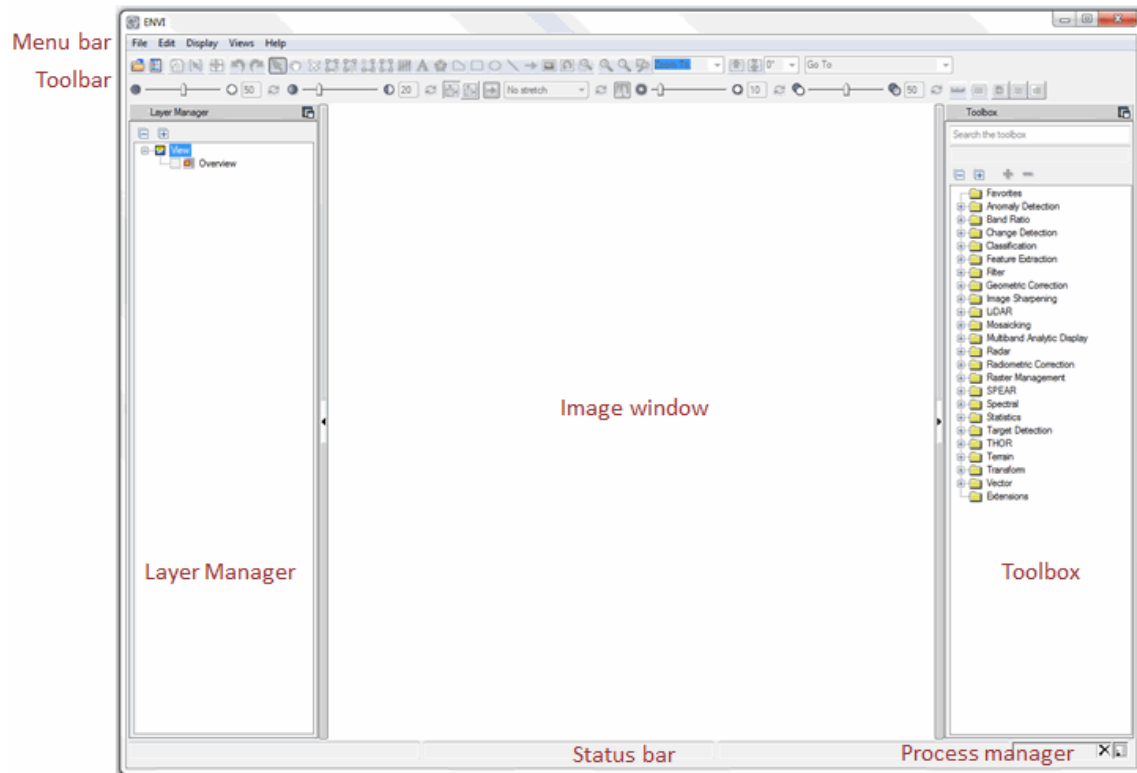
- **Windows:** C:\Program Files\Exelis\ENVI50\data
- **Linux:** /usr/local/exelis/envi50/data
- **Macintosh:** /Applications/exelis/envi50/data

File	Description
qb_boulder_msi	QuickBird multispectral image subset (2.4 meter spatial resolution) of Boulder, CO, courtesy of DigitalGlobe.
qb_boulder_pan	QuickBird panchromatic image subset (0.6 meter spatial resolution) of Boulder, CO, courtesy of DigitalGlobe.

## The ENVI 5 User Interface

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Ensure that ENVI 5 is properly installed and licensed before starting the application. When you start the ENVI application, the user interface displays. The interface contains various panels that allow you to visualize and organize your datasets. For those who have used previous versions of ENVI, the application incorporates elements of ENVI Zoom, ENVI Classic, and ENVI EX.

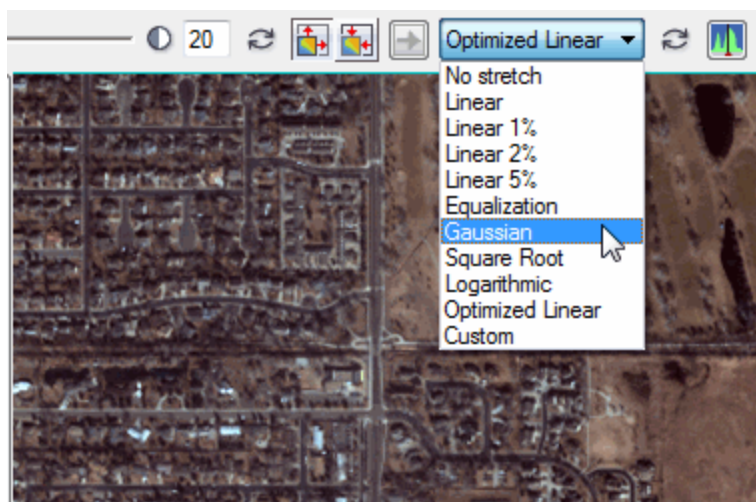



The toolbar has icons for opening images and interacting with the display such as zooming, stretching, transparency, sharpness, contrast, and brightness. It has different options for navigating the display (Image window) and for working with vectors.

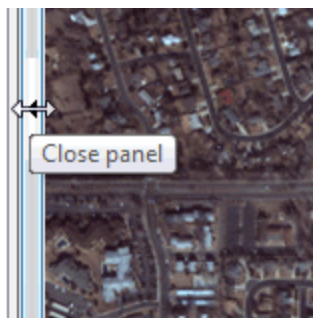
When you display a dataset, its name is listed in the Layer Manager. The Toolbox lets you access various analytic tools. You can search for tools in the Search window above the Toolbox.


## Display Images

1. From the menu bar, select **File > Open**. A file selection dialog appears.
2. Navigate to the ENVI installation path (see [Files Used in This Tutorial](#)) and select the file `qb_boulder_msi`. Click **Open**. By default, the image displays in true color with an Optimized Linear stretch.
3. From the stretch type drop-down button in the toolbar, select Gaussian.



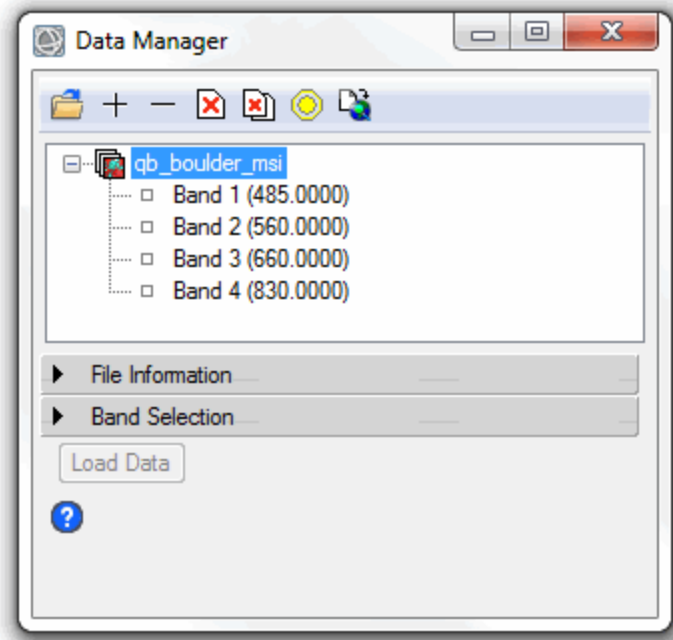
4. Click the Fixed Zoom In icon  in the toolbar to zoom into the display. Notice that the image is bordered by the Layer Manager on the left and the Toolbox on the right. You can close or undock these panels to provide more room to display the image.
5. Click the **Close Panel** arrow icon on both sides of the image to collapse (hide) the Layer Manager and Toolbox.



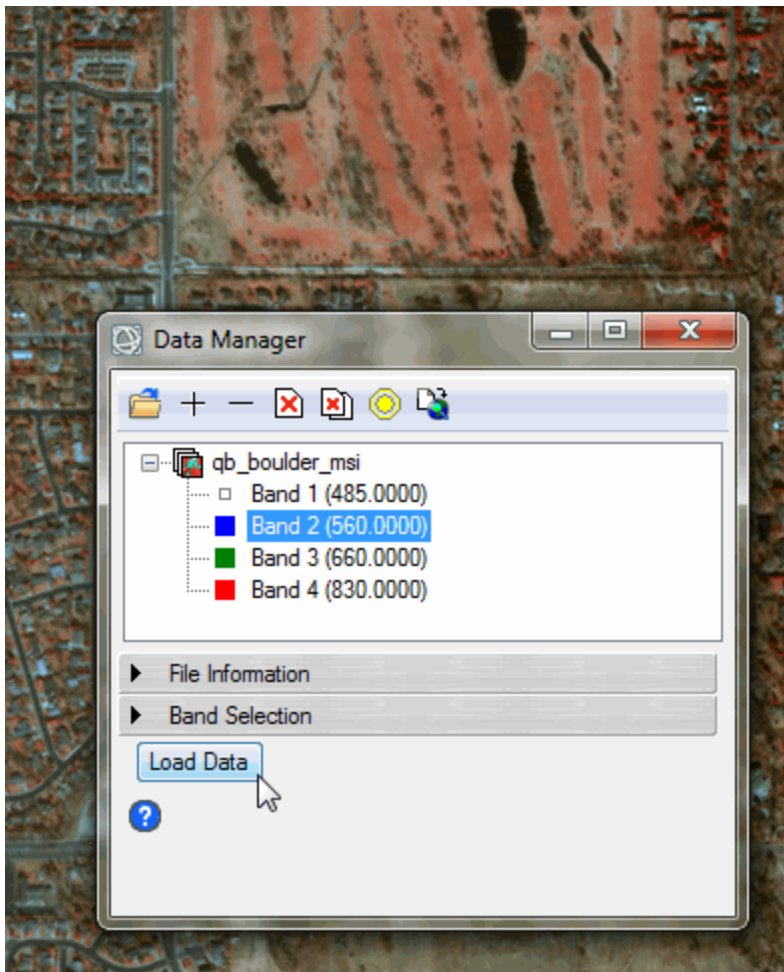
6. Click the arrow buttons again to expand the panels.
7. Click the **Detach** icon  in the upper-right corner of the Layer Manager and Toolbox panels to detach them from the user interface. They become floating dialogs that you can move to a second monitor, for example.
8. Click the red X button in the upper-right corner of the Layer Manager and Toolbox dialogs to re-attach them to the ENVI user interface.
9. To navigate the image, click the **Pan** button in the toolbar, then click and drag the Pan cursor in the image to move around. Or, click the **Fly** button in the toolbar and click

inside the display to move in a straight line in any direction. You can also use the middle mouse wheel to zoom in and out of the image.

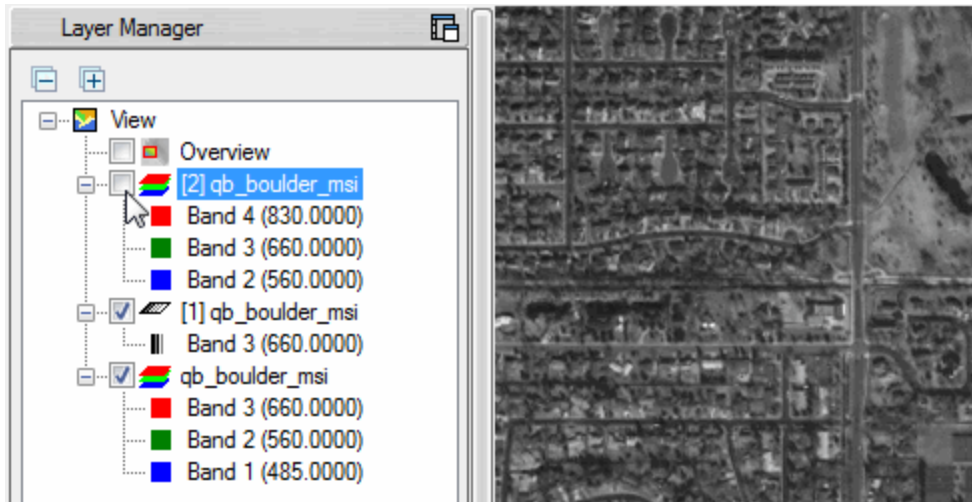
- From the menu bar, select **File > Data Manager**. The Data Manager lists all of the bands in all of the files that are open in the current session, even those that are not listed in the Layer Manager or displayed in the Image window.



- Select **Band 3** and click **Load Data**. Band 3 displays as a grayscale image. You can also display a grayscale image of any band by right-clicking on the band name and selecting **Load Grayscale**.
- Select in order **Band 4**, **Band 3**, and **Band 2**. Click **Load Data**. Notice that each selected band has a color square to its left in the Data Manager. The order in which you select the bands to display corresponds to the color order red, green, and blue. This band combination displays a color-infrared version.



13. Change the brightness, contrast, sharpness, and transparency of the color-infrared layer by using the slider controls in the toolbar.
14. Click the check box next to the color-infrared layer in the Layer Manager to hide that layer. The underlying grayscale image is displayed now. Clicking layers on and off allows you to easily compare them.




15. Right-click on the color-infrared layer in the Layer Manager and select **Remove**.

## Link Multiple Views

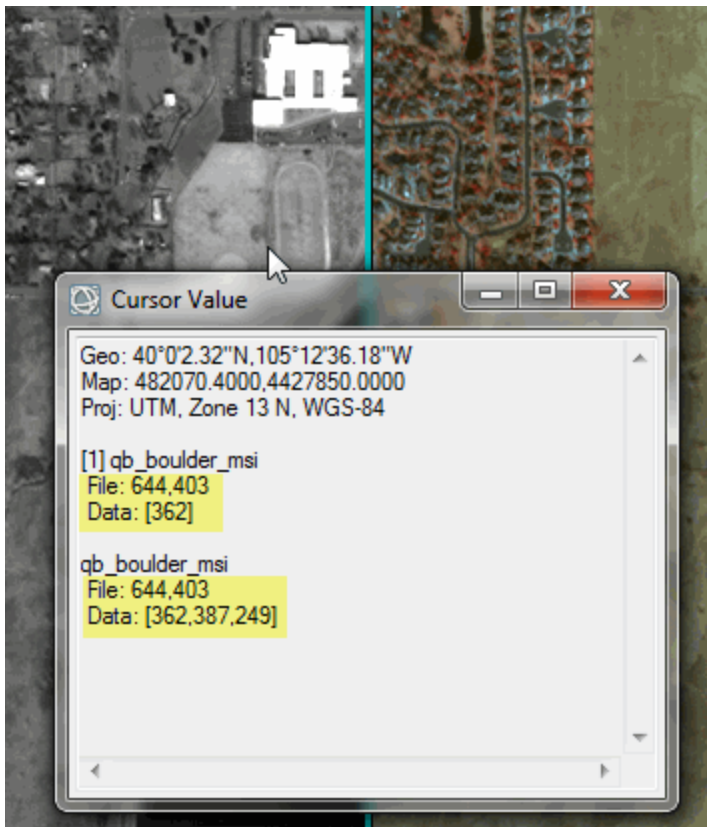
At this point, the Layer Manager should only list the grayscale image (first) and the true-color image (second). Instead of overlaying layers and toggling them on and off in the Layer Manager, you can create multiple views to compare images side-by-side.

1. From the menu bar, select **Views > Create New View**. A new view appears to the right of the grayscale image. The Layer Manager also contains an empty View layer. This is the *active view*, highlighted with a cyan-colored border in the Image window. All subsequent navigation and image enhancement operations will be in the active view.
2. In the Data Manager, right-click on `qb_boulder_msi` and select **Load CIR**. A color-infrared layer is added to the second view.
3. From the menu bar, select **View > Geo Link Views**.
4. Because `qb_boulder_msi` is georeferenced to a standard map projection, you can link the views by geographic location. Click the **Link All** button in the Geo Link Views dialog, then click **OK**.



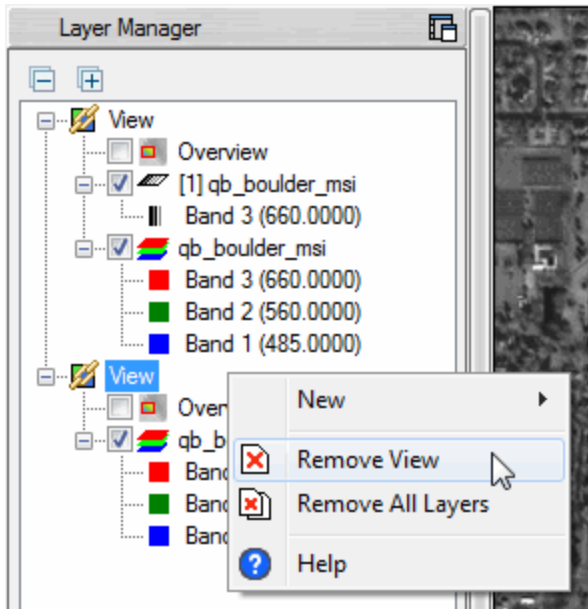
5. Click the Pan icon in the toolbar and pan around the grayscale image. The color-infrared image moves as well, and the same area is shown in both views.
6. Click the **Cursor Value** icon  in the toolbar.
7. The Cursor Value dialog shows pixel location and data values for each layer under the cursor. You may need to expand the bottom of the Cursor Value dialog to see the values for both layers.
  - The File lines show the pixel coordinates for both layers.
  - The Data lines show the red, green, and blue digital number (DN) values for both layers.





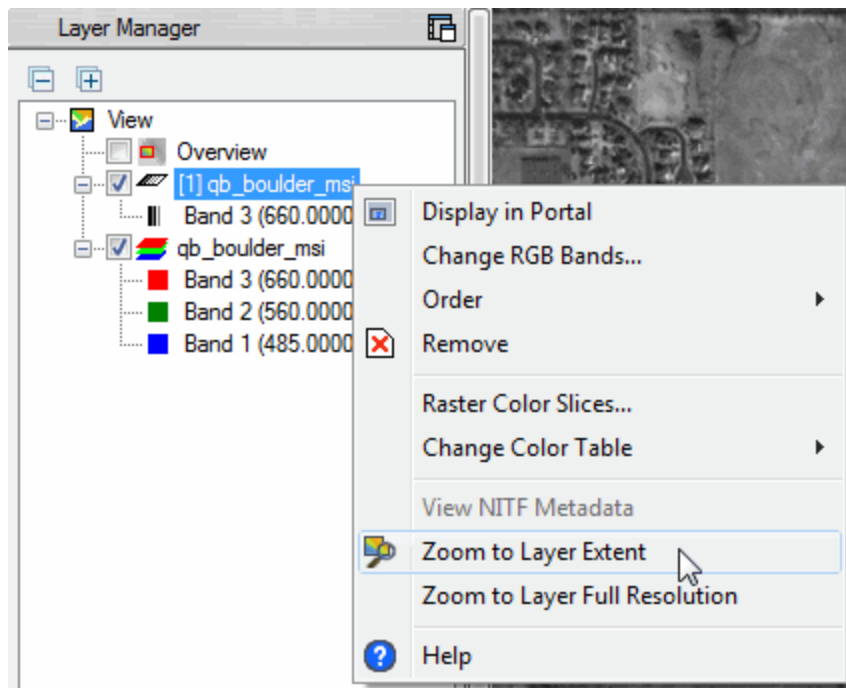
8. Close the Cursor Value dialog.
9. Close the second view by right-clicking on the second view in the layer manager and selecting **Remove View**.





## Apply a Color Table

1. Right-click on the grayscale layer in the Layer Manager and select **Zoom to Full Extent**.



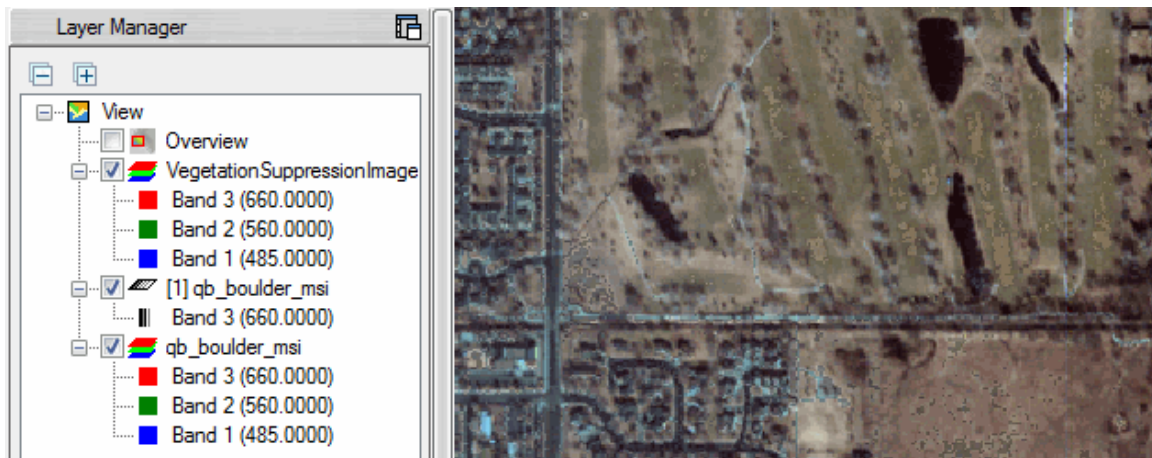
2. Right-click again on the grayscale layer in the Layer Manager and select **Change Color Table > More**.
3. In the Change Color Table dialog, click the **Load IDL Color Table** drop-down list and select **Haze**. ENVI applies a color table where the lowest DN values in Band 3 are colored blue and the highest values are colored yellow.
4. Click **Cancel** in the Change Color Table dialog to revert back to a grayscale image.

## Run Vegetation Suppression

This part of the tutorial shows how to use one of ENVI's many analytic tools. In this example, you will remove the vegetation spectral signature from the QuickBird image using the near-infrared and red bands. Suppressing vegetation helps to better interpret geologic and urban features.

1. In the search window of the Toolbox, type **vegetation**.
2. A list of tools whose name contains "vegetation" appears. Double-click the **Vegetation Suppression** tool.
3. In the Select Input File dialog, `qb_boulder_msi` is already selected. Click **OK**.

4. In the Specify Output File dialog, leave the **Output File** format as **ENVI**.
5. Enter an output filename and location.
6. Ensure that the **Display Result** option is selected, then click **OK**. The Process manager in the lower-right corner of the interface shows the processing status. When processing is complete, a true-color image appears with the vegetation pixels subdued in the red and near-infrared bands.



This concludes the tutorial. For more information on using ENVI, please refer to the ENVI Help by clicking **Help > Contents** from the menu bar. Other tutorials also are available from the ENVI Help or on the Exelis VIS website.

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