

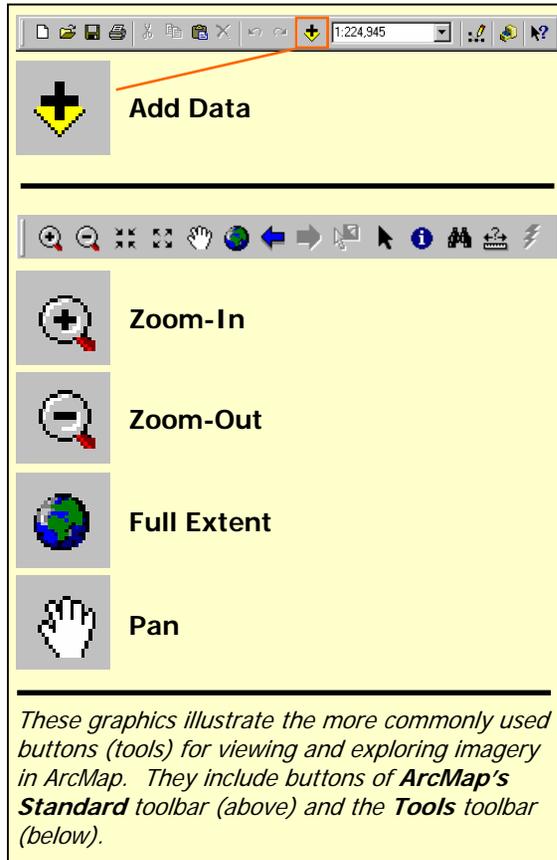


# Image Viewing Tools & Techniques

## Remote Sensing For Ranger Districts Using Image Analysis For ArcGIS



Document Updated: June, 2005



### Objective

- To describe image viewing tools and techniques of Image Analysis for ArcGIS.

### Required Data

- Two digital images representing the same geographic area—at least one must be multispectral (Suggested Datasets: Landsat Multispectral and Panchromatic, or Landsat Multispectral and DOQ).

### Introduction and Overview of Procedure Steps

Image viewing tools are fundamental to image processing software. The intent of this document is to describe and illustrate the image viewing tools and techniques of Image Analysis. This document is organized into the following six sections:

1. Load a Multispectral Image in ArcMap
2. Explore the Zoom In, Zoom Out, Pan, and Full Extent Tools
3. Change Band Combinations
4. Adjust Image Brightness and Contrast
5. Compare Multiple Image Sets using the Table of Contents and Effects Toolbar
6. Arrange the Display Order of Layers

#### I. Load a Multispectral Image in ArcMap

1. Launch **ArcMap** from the **Start** menu (**Start | Programs | ArcGIS | ArcMap**).
2. Select the **Add Data** button from **ArcMap's Standard** toolbar (see graphic to the left).
3. Navigate to and select the multispectral image.
4. Select **Add** to load the multispectral image into **ArcMap's Table of Contents**.

#### II. Explore the Zoom-In, Zoom-Out, Pan, and Full Extent Tools

1. Select the **Zoom-In** button from **ArcMap's Tools** toolbar.
  - Move your **Cursor** over the **Image** in the **Data View**.
  - Single-click on the **Image** to zoom-in to an area of interest, or click and drag a rectangle around an area of interest.
2. Select the **Zoom-Out** button from **ArcMap's Tools** toolbar.
  - Move your **Cursor** over the **Image** in the **Data View**.
  - Single-click on the **Image** to zoom-out from an area of interest.
3. Select the **Pan** button from **ArcMap's Tools** toolbar.
  - Move your **Cursor** over the **Image** in the **Data View**.
  - Single-click and drag your **Cursor** across the image. Release the click to stop panning.



A computer's display device has three color guns—red, green, and blue—that display thousands of color variations. To display multispectral imagery, set a band (layer) to a specific color gun. For example, when displaying a Landsat TM image, it is common to set the red color gun to **layer\_4**, the green color gun to **layer\_3**, and the blue color gun to **layer\_2** (simply called 4, 3, 2). These color gun assignments display the image as a Color Infrared Composite. Other common Landsat TM color gun assignments include 3, 2, 1 which displays the image in natural color, and 4, 5, 3 which is useful for vegetation discrimination.



**Toggle Images** indicates that you switch between two or more images being displayed in the Data View.



This graphic illustrates the **Effects** toolbar and its associated buttons—**Contrast**, **Brightness**, and **Adjust Transparency**.

4. Select the **Full Extent** button from **ArcMap's Tools** toolbar. The image should be displayed in its full extent view in the **Data View**.

### III. Change Band Combinations

1. Double-click the multispectral image in the **Table of Contents**, and select the **Symbology** tab from the **Layer Properties** dialog.
2. Click the dropdown menu arrow of a color gun (Red, Green, and/or Blue) in the **Bands** section of the **Symbology** tab, and select a different band (or layer).
3. Select **Apply** to accept the changes, and **OK** to close the **Layer Properties** dialog. Inspect the new display in the **Data View**.

### IV. Adjust Image Brightness and Contrast

1. Select **View | Toolbars** from **ArcMap's** main menu, and enable the **Effects** toolbar to open the **Effects** toolbar (see graphic to the left).
2. Set the **Layer** dropdown menu to the multispectral image you would like to adjust from the **Effects** toolbar.
3. Select the **Contrast** button from the **Effects** toolbar, and click on the **Slider Bar** to adjust the image's contrast.
4. Select the **Brightness** button from the **Effects** toolbar, and click on the **Slider Bar** to adjust the image's brightness.

### V. Compare Multiple Image Data Sets Using the Table of Contents and the Effects Toolbar

1. Select the **Add Data** button from **ArcMap's Standard** toolbar.
2. Navigate to and select an image (different than the image you have already loaded)—the image should represent the same geographic location of the multispectral image you have already loaded.
3. Select **Add** to load the image into **ArcMap's Table of Contents**.
4. *Image comparison technique using the **Table of Contents**.* Toggle the images (at the top of the **Table of Contents**) by clicking the 'top-most' image on and off in the **Table of Contents**. Compare features between the images as you toggle.
5. *Image comparison technique using the **Effects toolbar**.* Specify the image (you just loaded) in the **Layer** dropdown menu from the **Effects** toolbar.
  - Select the **Adjust Transparency** button from the **Effects** toolbar.
  - Click the **Slider Bar** and adjust the transparency as necessary.
  - Note: the **Effects** toolbar is most useful when displaying a moderate resolution image with a high resolution image to create a **Resolution Merged** display.



**Contrast and brightness adjustments** are applied only to an image's **Look-up Table**. The adjustments are designed to increase the image's visual interpretability. However, ensure that you do not save the contrast and brightness adjustments to the image file if you plan on performing subsequent spectral analysis. If you save the adjusted data as the image's spectral data, you have modified the original data so that it no longer truly measures the reflectance of ground features.

### VI. Arrange the Display Order of Layers

1. Single-click the bottom image listed in the **Table of Contents**, drag the image up to the top of the list (just under **Layers** in the **Table of Contents**), and release (the order the images are displayed in the **Data View** depends on the order they are listed in the **Table of Contents**—the first image is displayed on top).