

Viewer & Geospatial Light Table

Introduction

Use the Landsat ETM image of 1999 of Dedoplistskar
File:
Dedo_ETM_20Aug99_ms

In this tour guide, you can learn how to:

- set Preferences
- display an image
- query for pixel information
- arrange layers
- adjust image contrast
- link Viewers
- use the Area of Interest (AOI) function
- use the **Raster** menu functions (Raster Attribute Editor, Measurement tools, and so on)
- use the geospatial light table



Approximate completion time for this tour guide is 45 minutes.

Display Preferences

Check Band-to-Color Gun Assignments

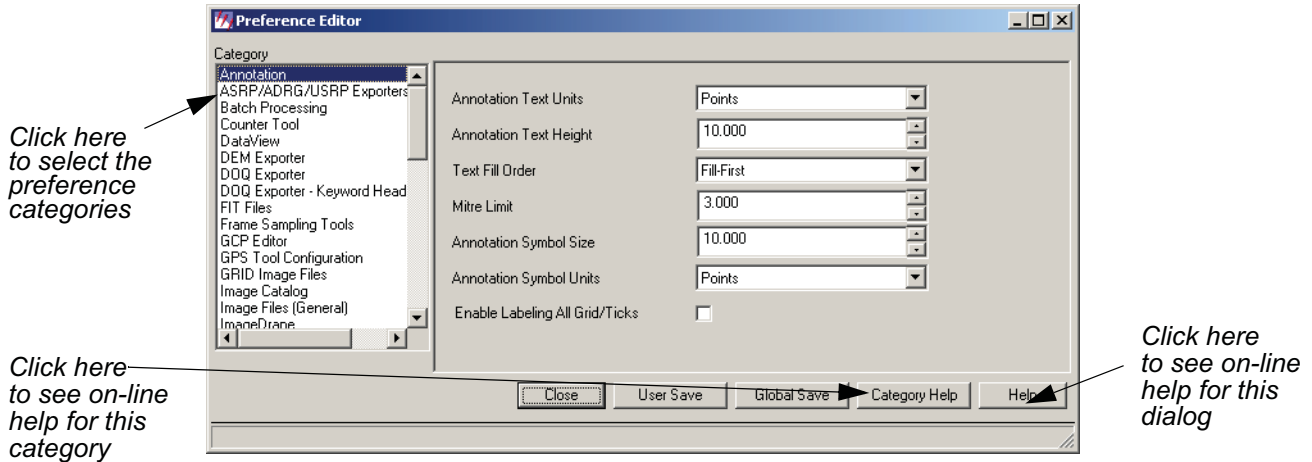
Leave the Display Preferences for the moment being as they are

ERDAS IMAGINE allows you to set up default band-to-color gun assignments for Landsat MSS, Landsat TM, SPOT, and AVHRR data in the Preference Editor.

ERDAS IMAGINE should be running and a Viewer should be open.

1. Click the word **Session** in the upper left corner of the ERDAS IMAGINE menu bar.
2. From the **Session** menu, click **Preferences**.

The Preference Editor opens.



3. Drag the scroll bar on the right side of the dialog down to see all of the **User Interface & Session** preferences (**User Interface & Session** is the default under **Category**).

You may change these or any other preferences at any time by selecting the preference category (click the list below **Category**) and then editing the text in the text entry fields.

4. Under the **User Interface & Session** category in the Preference Editor, locate the preferences for the **3-Band Image Red Channel default**, **3-Band Image Green Channel default**, **3-Band Image BlueChannel default**, **4-Band Image Red Channel default**, **4-Band Image Green Channel default**, **4-Band Image Blue Channel Default**, **5-Band Image Red Channel default**, **5-Band Image Green Channel default**, **5-Band Image Blue Channel Default**, **6-or-greater-Band Image Red Channel default**, **6-or-greater-Band Image Green Channel default**, and **6-or-greater-Band Image Blue Channel Defaults**.

The number that is entered for these defaults shows the band that is used for the Red, Green, and Blue color guns in your display. You may change these defaults. These are the band assignments that display in the **Layers to Colors** section of the Select Layer To Add dialog when it opens. These assignments can also be changed in the Select Layer To Add dialog for specific files.

Check Viewer Preferences

1. With the Preference Editor still open, click the **Category** list and select **Viewer**.

The Viewer preferences display.

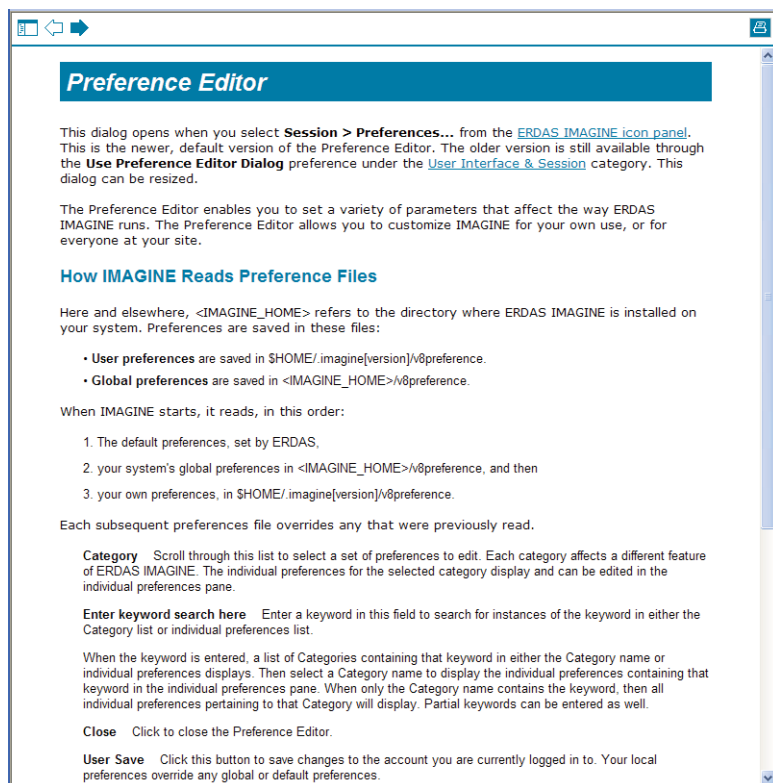
2. Drag the scroll bar on the right of the dialog down to see all of the **Viewer** preferences.

These preferences control the way the Viewer automatically displays and responds each time it opens.

Check Preference Editor Help

1. Click **Help** in the lower right corner of the dialog.

The On-Line Help for the Preference Editor opens.



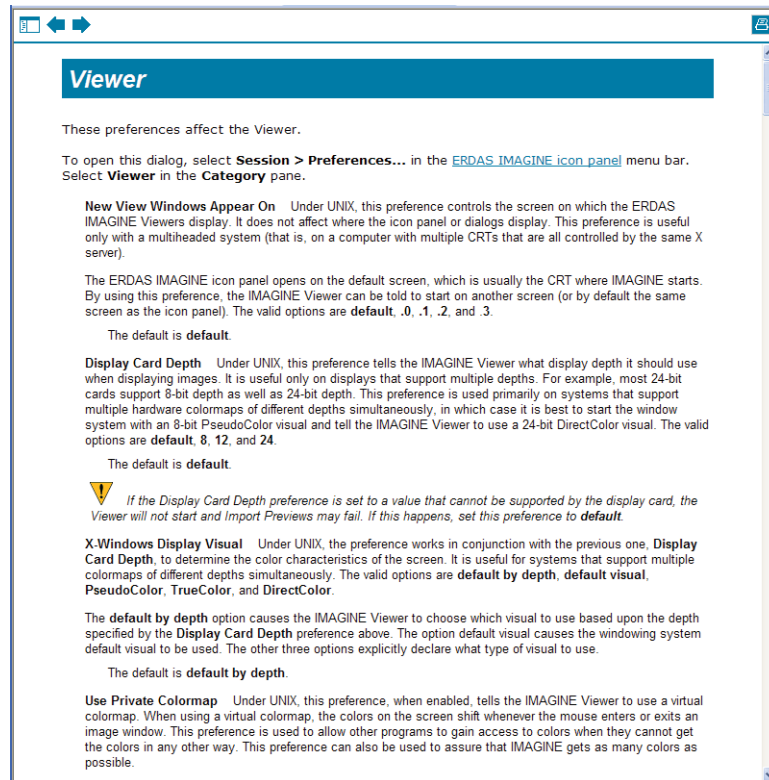
2. When you are through studying the Preference Editor help file, select **File -> Exit** from the On-Line Help file menu bar.

The On-Line Help file closes.

View Category Help

1. Click the **Category Help** button on the Preference Editor.

The On-Line Help for this category, **Viewer**, opens.



2. When you are through studying the Viewer preferences help file, select **File -> Exit** from the On-line Help file menu bar.
3. Click the **Close** button on the Preference Editor.

*NOTE: If you have changed any preferences, you can save them at this time by clicking the **User Save** or **Global Save** buttons on the Preference Editor dialog.*

Display an Image

Use the ETM image of Dedoplistskaro

Next, you display a Landsat Thematic Mapper (TM) image of Gainesville, Georgia in a Viewer.

Since the data files in the <ERDAS_Data_Home>/examples directory are read-only, you may want to copy them to a new directory and change the file permissions. Remember, <ERDAS_Data_Home> represents the name of the directory where sample data is installed.

1. In the Viewer menu bar, select **File -> Open -> Raster Layer**.

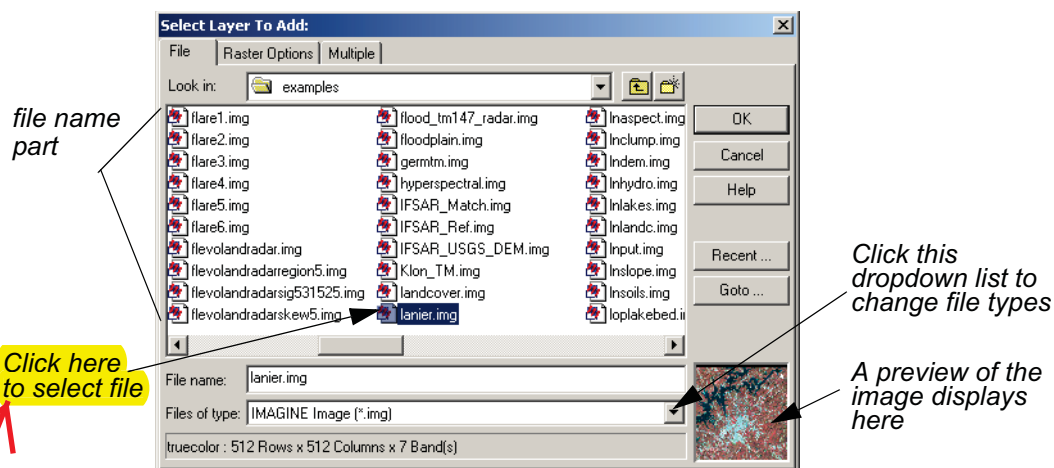


You can also open this dialog using either of these two methods:

— use the keyboard shortcut, **Ctrl-r**

— click this icon  in the Viewer toolbar.

The Select Layer To Add dialog opens.



Go to the folder with the ETM image of Dedoplistskaro

2. In the Select Layer To Add dialog, click the **Recent** button.

A dialog with a listing of the most recent files you have opened displays. You can individually select these files and then click **OK** to display them quickly in the Select Layer To Add dialog.

3. Click **Cancel** in the List of Recent Filenames dialog.

4. In the Select Layer To Add dialog, click the **Goto** button.

A dialog with a listing of the most recent directories you have opened displays. You can individually select these directories, or enter the name of a new directory, and then click **OK** to display that directory quickly in the Select Layer To Add dialog.

- Click **Cancel** in the Select a Directory dialog.

*NOTE: The **Recent** and **Goto** buttons in the Select Layer To Add dialog are helpful for quickly locating and displaying a file or directory you work with often.*

File Name Part

The framepart under **Filename** is called a file name part. A file name part is a tool used to select specific files for use in an ERDAS IMAGINE function. A file name part consists of:

- a text field—for entering the file name by typing it in, or clicking on, the file from the scroll list.
- a scrolling list—shows the name of all files with the default extension in the selected directory. Files can be selected by

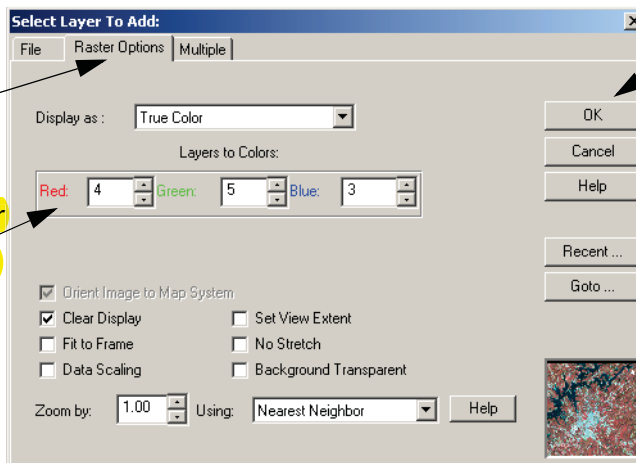
- In the file name part of the Select Layer To Add dialog, click the file **lanier.img.**

Select the filename:
Dedo_ETM_20aug99_ms

~~This is a Landsat TM image of the Gainesville, Georgia area, including Lake Lanier. Information about this file is reported in the bottom, left corner of the Select Layer To Add dialog. This true color image has seven bands, 512 columns, and 512 rows.~~

- Click the **Raster Options** tab at the top of the Select Layer To Add dialog.

The Raster Options display.



Click this file tab to display the raster options

Click here to display the image in the Viewer

Change the layer to color band assignment here

Try also other band combinations

- Under **Layers to Colors**, display band 4 in the **Red** color gun, band 5 in the **Green** color gun, and band 3 in the **Blue** color gun.

Display Options

1. Note the display options in the Select Layer To Add dialog.

Read the text

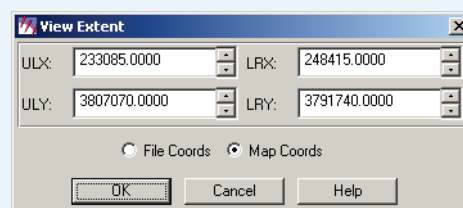
Display Options Defaults

The default settings of the Raster Options tab are briefly described below:

- **Orient Image to Map System**—This checkbox is enabled if calibration is saved to the image file. If there is no calibration, this option is disabled. When enabled, the image displays using calibration. Otherwise, the calibration is ignored.
- **Clear Display**—When this checkbox is enabled, and a new image is loaded, the image currently displayed in the Viewer is removed. Disable this checkbox to overlay images.
- **Fit to Frame**—If this checkbox is enabled, the image is magnified or reduced to fit the Viewer window at its current size.
- **Data Scaling**—The Viewer performs a two standard deviation stretch by default. Click this checkbox to select an alternate data range to stretch.

If you want to save the contrast stretched values with the image, you can use the **Radiometric Enhance -> LUT Stretch** option of Image Interpreter.

- **Zoom by**—If **Fit to Frame** is disabled, then you can enter the zoom ratio for the data in this data field.
- **Set View Extent**—Allows you to specify the upper left and lower right coordinates of the portion of the image to display.



The coordinates in this dialog set the area of the image to display in the Viewer. This is useful if you have an image that is larger than the Viewer window, or if you want only a specific portion of a large image to display in the Viewer. You can also select **View -> Scale -> Extent** from the Viewer menu bar.

Display Options Defaults, Continued

- **Background Transparent**—Click to make the background of grayscale, pseudocolor, and true color areas transparent—the layer underneath shows through. Background areas are automatically transparent in thematic layers.
- **Using**—Resampling is appropriate if the image is magnified (a magnification factor greater than one). Use one of the following resampling methods: Nearest Neighbor, Bilinear Interpolation,

2. Click **OK** in the Select Layer To Add dialog to display the file.

The file **lanier.img** displays in the Viewer. The name of the file and the layers selected are written in the Viewer title bar.

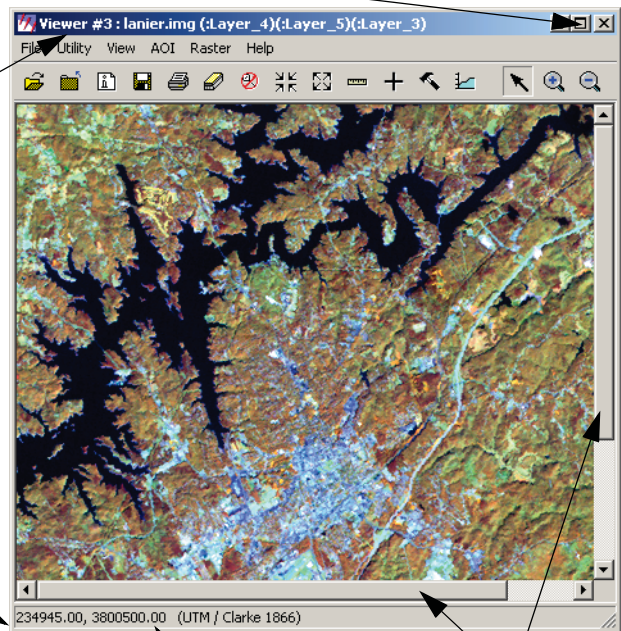
ETM image of 1999

Click here to minimize the window

The title bar shows the Viewer number and name of image displayed

In the title bar, hold and drag to move the Viewer

Drag on any of the corners to resize the Viewer



Single-line help and coordinates display in this Status Bar

Use the scroll bars to roam in an image

Utility Menu Options

The **Utility** menu on the Viewer enables you to access four separate groups of functions:

- inquiry functions
- measurement tool

- layer viewing
- information

Each function group is separated by a line in the dropdown menu.

Use Inquiry Functions

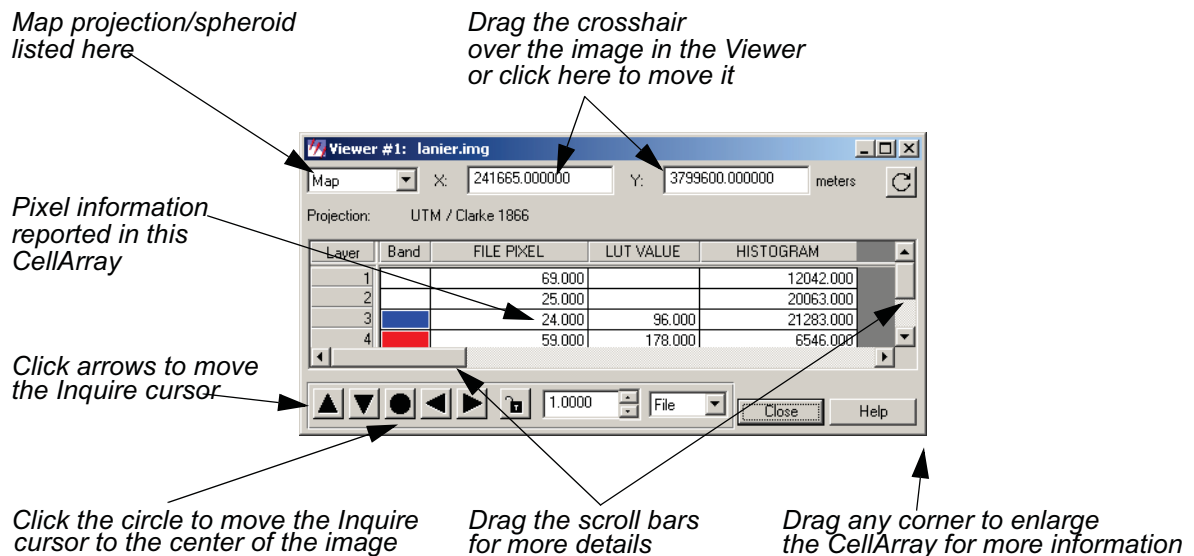
You can query a displayed image for information about each pixel using the inquiry functions.

ETM image of 1999

The file **lanier.img** must be displayed in a Viewer.

1. Select **Utility -> Inquire Cursor** from the Viewer menu bar.

A white crosshair displays in the Viewer and the Inquire Cursor dialog opens.



You can move the Inquire Cursor in the Viewer using any of these methods:

- Drag the white crosshair over the image.
- Enter new coordinates into the CellArray™ of the Inquire Cursor dialog. The Inquire Cursor moves when you move the mouse cursor back into the Viewer.
- Click the black arrows at the bottom of the Inquire Cursor dialog.

As the crosshair is moved, the information in the Inquire Cursor dialog automatically updates.

- The CellArray in the Inquire Cursor dialog reports a variety of pixel information. Drag on the horizontal scroll bar (or enlarge the Inquire Cursor dialog by dragging any corner) to show all of the pixel information available in the CellArray.

Change Inquire Cursor Style

You can do this at a later moment

You can change the color and shape of the Inquire Cursor to make it more visible in the Viewer.

- To change the color of the Inquire Cursor, select **Utility -> Inquire Color** from the Viewer menu bar.

The Inquire Color dialog opens.



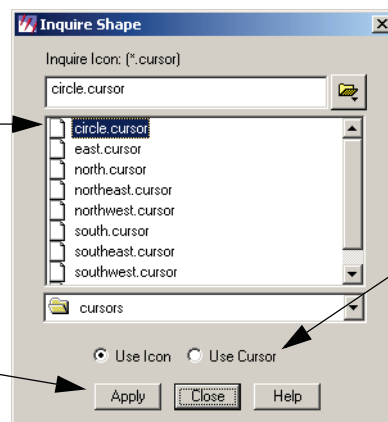
Hold on the dropdown list to select a new color

- Select a new color for the Inquire Cursor by holding on the **Inquire Color** dropdown list and dragging to select the desired color.
- Click **OK** in the Inquire Color dialog.

The Inquire Cursor changes color.

- To change the shape of the Inquire Cursor, select **Utility -> Inquire Shape** from the Viewer menu bar.

The Inquire Shape dialog opens.



Click to select a new shape

Click here to apply the new shape to the Inquire Cursor

Click to make the Inquire Cursor an icon or a cursor

- Click **circle.cursor** in the scroll list that displays, then click **Apply**.

The Inquire Cursor becomes a circle.


- In the Inquire Shape dialog, click the **Use Cursor** button, then **Apply** to return the Inquire Cursor to the original crosshair shape.
- Click **Close** in the Inquire Shape and the Inquire Cursor dialogs.

The Inquire Cursor is cleared from the Viewer.

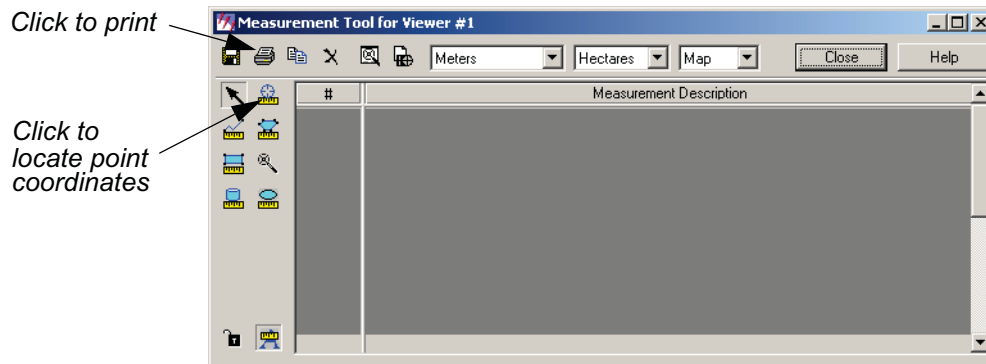
The Measurement tool enables you to measure points, lines, polygons, rectangles and ellipses in the displayed layer. Both distance and area are reported in the units you select.


Take Measurements

Compare the measurements with the scale of the map


- Click the Measurement icon  in the Viewer toolbar or select **Utility** -> **Measure** from the Viewer menu bar.

The Measurement Tool viewer opens.



- Click the Measure Positions icon  in the Measurement toolbar. This tool gives the individual point coordinates (x, y) in the image.
- Move the cursor into the Viewer and click anywhere.

In the Measurement Tool viewer, the location of the point displays in the type of units in which the file is saved. You may select different display units from the dropdown lists in the top toolbar.

- Next, click the Polyline icon  in the Measurement Tool viewer toolbar.
- Move the cursor into the Viewer and click once at the beginning of a line feature then drag the mouse to extend the line along the feature. Click to add a vertex at each point. Middle-click (or double-click, depending on how your Preferences are set) to end the measurement.


The length displays in the Measurement Tool CellArray.


The Measurement Tool



The Measurement Tool can create a new annotation layer on top of your image. Simply click the Annotation tool and a new layer is automatically created. While this tool is enabled, the measurement features (points, polylines, polygons, rectangles, ellipses, etc.) are added to the annotation layer as well as a text box containing the measured values. Click the tool again to turn this feature off.

The annotation layer may be saved and used with other images with the same geographic area.

- ~~6. Click the Print icon  to print and a Print dialog opens, which allows you to enter or select the printer to be used.~~
- ~~7. Select the **Printer** and click **Print** (or **OK**) in the Print dialog. If you do not wish to print, click **Cancel**.~~
8. Experiment with the other measurement tools if you like, and when you are done, click the **Close** button in the top toolbar.

You are asked if you want to save the measurements. Save them if you like. You can click the Save icon  at any time to save your measurements.



Click the **Help** button to view the On-Line Help for the measurement tools.

View Menu Options

Arrange Layers

ERDAS IMAGINE should be running, and **lanier.img** should be displayed in a Viewer.

1. In the Viewer toolbar, click the Open icon  to open another layer on top of **lanier.img**.

The Select Layer To Add dialog opens.

ETM of 1999

ETM image of 22 May 2007 File:
Dedoplis_ETm_22may07_ms



2. In the Select Layer To Add dialog under **File name**, click **Insoils.img**.
This is a thematic soils file of the Gainesville, Georgia area.
3. Click the **Raster Options** tab at the top of the Select Layer To Add dialog.
4. Check to be sure that the **Clear Display** checkbox is disabled (not selected), so that **lanier.img** is not cleared from the Viewer when **Insoils.img** displays.
5. Click **OK** in the Select Layer To Add dialog to display the file.

ETM image of 2007
on top of ETM
image of 1999

Now, both **lanier.img** and **Insoils.img** are displayed in the same Viewer, with **Insoils.img** on top.

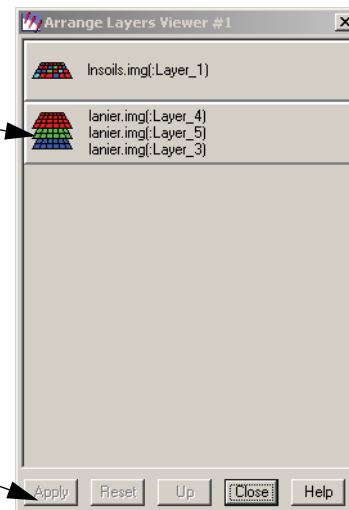
ETM image of 1999

6. To bring **lanier.img** to the top of the Viewer, select **View -> Arrange Layers** from the Viewer menu bar.

The Arrange Layers dialog opens.

Click and drag
this box to the top
to change the
order of the
displayed layers

Click here to
redisplay layers
in the new order



Drag the ETM 99
image on top of the
ETM 2007 image

7. In the Arrange Layers dialog, drag the **lanier.img** box above the **Insoils.img** box, as illustrated above.

When you release the mouse button, the layers are rearranged in the Arrange Layers dialog so that the **lanier.img** box is first.

8. Click **Apply** in the Arrange Layers dialog to redisplay the layers in their new order in the Viewer.

The layers are now reversed.

9. Click **Close** in the Arrange Layers dialog.

Zoom

In this section, you zoom in by a factor of 2 and create a magnifier window. Once the image enlarges, you can roam through it.

ETM image of
1999 on top of
ETM 2007

lanier.img should be displayed on top of **Insoils.img** in a Viewer at a magnification of 1 (this is the case if you have been following through this tour guide from the beginning).


1. Select **View -> Zoom -> In by 2** from the Viewer menu bar.

The images are redisplayed at a magnification factor of 2.



The Zoom options are also available from:

— the **Quick View menu** (right-hold on the Viewer image) under **Zoom -> Zoom In by 2**

— the Viewer toolbar by clicking this icon .

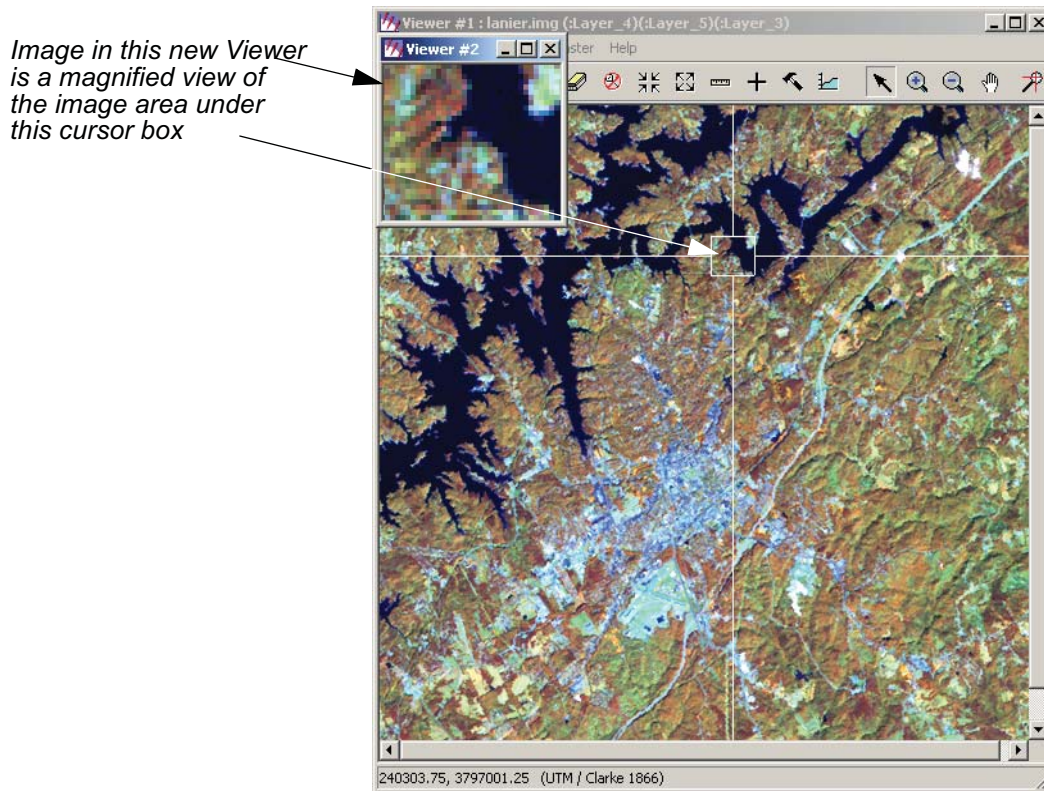
2. Move the scroll bars on the bottom and side of the Viewer window to view other parts of the image.

To move by small increments, you can click the small triangles at either end of the scroll bars. To move by larger increments, drag the scroll bars.

You can also enlarge the Viewer window by dragging any corner.

3. Select **View -> Create Magnifier** from the Viewer menu bar.

A white cursor box opens in the center of the image. This area displays in a small magnifier window that opens over the top corner of the Viewer.



4. With your pointer inside the white cursor box, hold and drag the box around the image.

The data in the magnifier window changes as the cursor box is moved over the image. This technique is called chip extraction, which is used in the Rectification tools to help you precisely identify ground control points (GCPs).

5. In the Viewer menu bar, select **File -> Close Other Viewers** to close the magnifier window.

Read the text

Magnifying Areas

There are four ways to change the size of the area magnified:

- With the cursor on any corner (or side) of the cursor box, drag the box until it is the desired size.
- Place the cursor on the lower right corner of the magnifier window and drag the magnifier window until it is the desired size.
- Press the space bar to enter precise positioning coordinates in the inquire box dialog.
- Use the **Quick View** menu (from the right mouse button) or the **View** menu (from the Viewer menu bar) to zoom in either Viewer.

As you try these methods, you notice that each change in size is reflected in the other window. As the cursor box is adjusted, the magnification in the magnifier window is adjusted to accommodate the new area. Likewise, as the magnifier window is adjusted, the cursor box changes to reflect the new size and proportion.


Other methods of zooming in and out of imagery are Animated Zoom, Box Zoom, and Real-time Zoom.

Animated Zoom


Animated Zoom enables you to zoom in and out of the Viewer's image in a series of steps that are similar to animation. The image is resampled after it is magnified or reduced.

Display **lanier.img** in the Viewer.



ETM of 1999

1. Select **Session -> Preferences**.
2. In the Preference Editor dialog, select **Viewer** from the **Category** list.
3. Click the checkbox for **Enable Animated Zoom**.
4. Click **User Save** then **Close** in dialog, and go back to the Viewer.
5. Click the Zoom In By Two icon .

The Viewer zooms into the image in a simulated animation by a factor of 2. The Viewer center is maintained.

6. Click the Zoom Out By Two icon .

The Viewer zooms out of the image in a simulated animation by a factor of 2. The Viewer center is maintained.

7. Click either the Interactive Zoom In  or the Interactive Zoom Out icon .
8. Click a location on the image.

The Viewer recenters the image to that location and zooms in or out in a simulated animation by a factor of 2.



*Animated zoom also works with **View -> Zoom -> In by X and Out by X**.*

Box Zoom

Box Zoom is used to select a boxed area in the image. When zooming in or out by using the zoom recentering icons, the boxed image enlarges or reduces within the Viewer.

Display **lanier.img** in the Viewer.

ETM of 1999

1. Select **Session ->Preferences**.
2. In the Preference Editor dialog, select **Viewer** from the **Category** list.
3. Click to select **Enable Box Zoom**.
4. Click **User Save** then **Close** in dialog, and go back to the Viewer.
5. Click the Interactive Zoom In icon.
6. Click and drag a box in the image.

The selected area of the image is magnified to fit the Viewer.

7. Select the Interactive Zoom Out icon.
8. Click and drag a box in the image.

The area displayed in the Viewer is reduced to fit in the box. Space surrounding the reduced image is populated with available imagery.

Real-time Zoom

When you select either of the Interactive Zoom tools, you can to zoom into and out of images in real time by holding the middle mouse button and moving the mouse upward and downward over the image.

NOTE: You can also hold down the Control key and press on the left mouse button to zoom in real time.

ETM of 1999

Display **lanier.img** in the Viewer. There is no need to set up a preference for this feature.

1. Select either of the Interactive Zoom icons.
2. Position the cursor in the Viewer, and hold the middle mouse button.
3. Move the mouse forward to zoom in on the image.

The image magnifies at a constant rate, depending on how far forward you move the mouse.

4. Hold the middle mouse button and move the mouse backward.

The image reduces at a constant rate, depending on how far downward on the image you move the mouse.

Display Two Images

Two or more Viewers can be geographically or spectrally linked so that when you roam in one image, that area is simultaneously displayed in the linked Viewer(s).

Types of Linking


- Geographically linked—the same image area displays in all linked Viewers.
- Spectrally linked—enhancements made to an image are also made in other Viewers if that same image, or portions of it, are

ETM of 1999 on top of ETM of 2007

The file **lanier.img** should be displayed on top of **Insoils.img** in a Viewer window, at a magnification of 2.

1. Drag on a lower corner of the Viewer so that it occupies the entire left half of the screen.
2. In the Viewer menu bar, select **View -> Split -> Split Horizontal**.

The Viewer is divided in half, horizontally, to form two Viewers.

3. In the toolbar of the new Viewer, click the Open icon  .

The Select Layer To Add dialog opens.

4. In the Select Layer To Add dialog under **File name**, click the file **Insoils.img**.
5. Click the **Raster Options** tab at the top of the dialog.

ETM of 2007

6. Confirm that **Zoom by** is set to **1.00**.
7. Click **OK** in the Select Layer To Add dialog.


The file **Insoils.img** displays in the second Viewer.

Link Viewers


1. In the first Viewer, select **View -> Link/Unlink Viewers -> Geographical**.

The Link/Unlink Instructions display.

2. Move your pointer to the second Viewer.

The pointer becomes a Link symbol .

3. Move the pointer to the first Viewer.

The No Link symbol  displays as the cursor in the first Viewer. Clicking in this Viewer discontinues the link operation.

4. To link the Viewers, click anywhere in the second Viewer.

The two Viewers are now linked. A white cursor box opens over the image in the second Viewer, indicating the image area displayed in the first Viewer.


You can move and resize this cursor box as desired, and the image area in the first Viewer reflects each change. This is similar to the magnification box you used earlier.

Compare Images

1. Drag the cursor box in the second Viewer to a new location. The image area selected in the second Viewer displays in the first Viewer.
2. Drag the scroll bars in the first Viewer to roam in the image.

The white cursor box in the second Viewer moves as the image area in the first Viewer changes.




You could also use the Roam icon  in the Viewer toolbar to roam over the image. Just move the hand across the Viewer image to change the view.

Unlink Viewers

1. In either Viewer, select **View -> Link/Unlink Viewers -> Geographical** to unlink the Viewers.

The Link/Unlink Instructions display.

2. Move the pointer to the other Viewer.

The unlink cursor  displays.

3. Click anywhere inside the Viewer to unlink the Viewers.
4. In the menu bar of the second Viewer, select **File -> Close**.

The second Viewer closes.

5. In the first Viewer, select **File -> Clear** to clear the Viewer.

Raster Menu Options

Create an AOI Layer

These options allow you to define an AOI in the image, excluding other parts of the image. Specific processes can be applied to this AOI only, which can save considerable time and disk space. The option to use a specified AOI for processing is available from many dialogs throughout ERDAS IMAGINE.

This exercise tells you how to create an AOI layer that can be saved as a file and recalled for later use.

NOTE: Each Viewer can display only one AOI layer at a time.

ETM of 1999

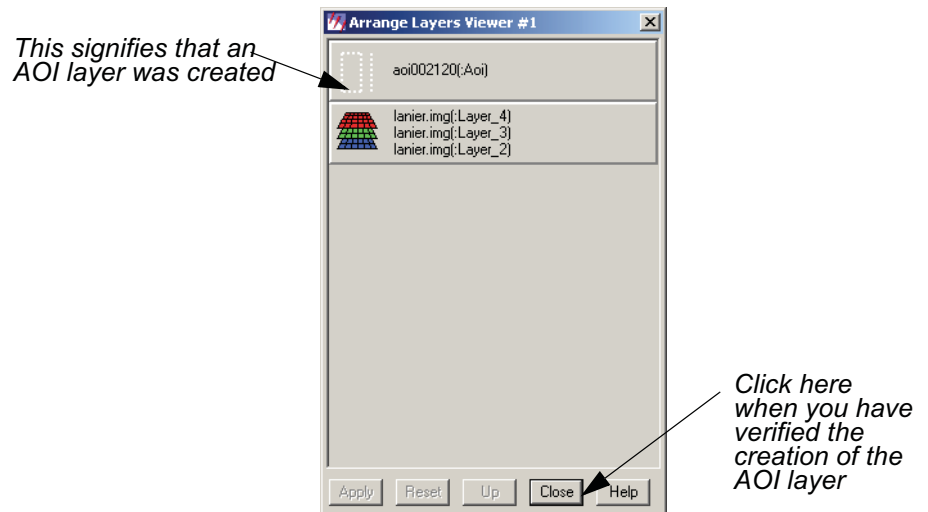
Display **lanier.img** in a Viewer. You *must* have an image displayed in the Viewer to create an AOI layer.

1. Select **File -> New -> AOI Layer** from the Viewer menu bar.

ERDAS IMAGINE creates an AOI layer.

2. Select **View -> Arrange Layers** from the Viewer menu bar to verify that the AOI layer has been created.

The Arrange Layers dialog opens, and should look similar to the following example:



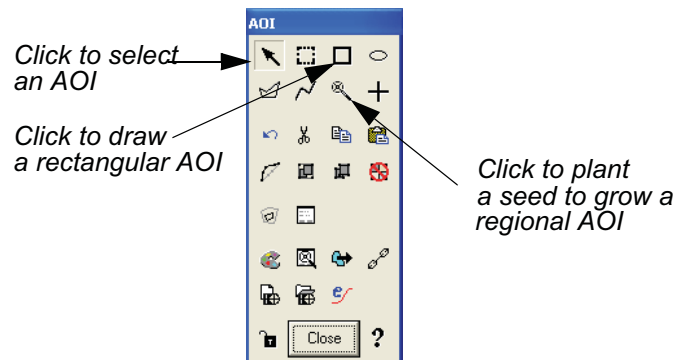
3. After verifying the creation of the AOI layer, click **Close** in the Arrange Layers dialog.


Later, you are asked to name the layer and save it to a file.

Open AOI Tools

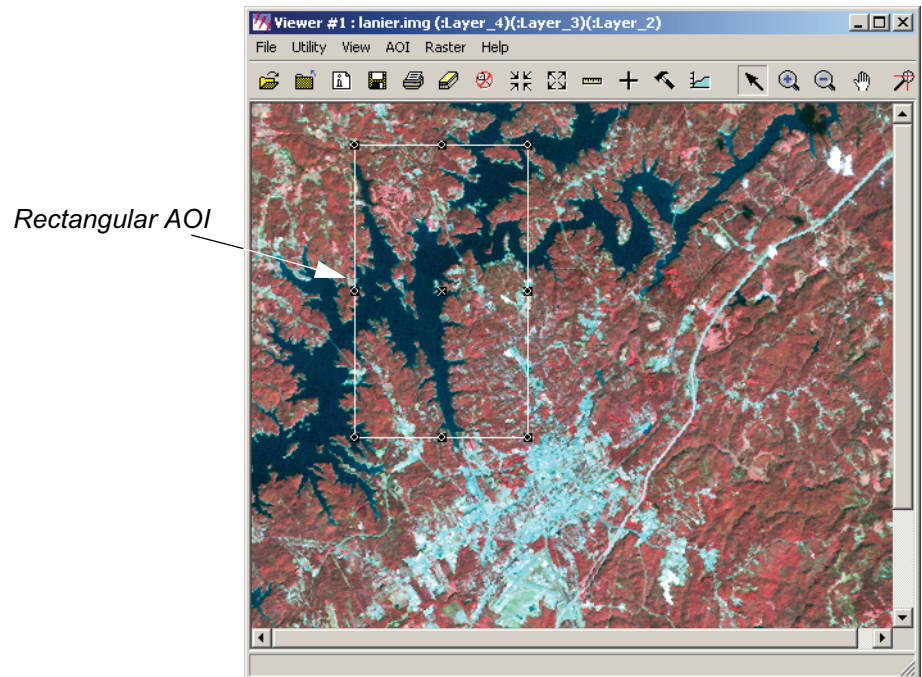
1. Select **AOI -> Tools** from the Viewer menu bar (or click the Tools icon on the toolbar).

The AOI tool palette displays.



2. Click the Rectangle icon in the AOI tool palette  .
3. Move the cursor into the Viewer window. Drag and then release to draw a rectangle over the AOI. Include a portion of the water when designating the AOI.

A rectangular AOI displays in the Viewer.



Selecting AOIs

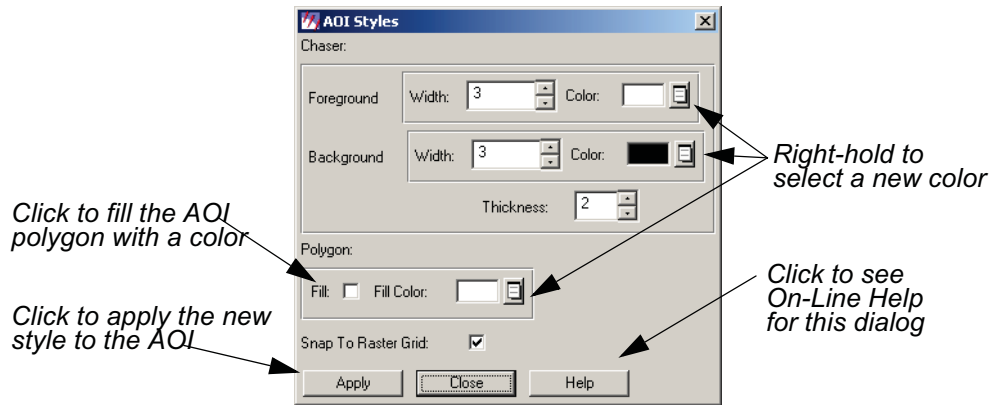
Following are some tips regarding the selection of the AOI:

- You can move the AOI by dragging the AOI to a new location.
- You can resize the AOI by dragging any of the handles at the corners and sides of the bounding box, or by pressing the space bar to enter precise coordinates.
- The **x** in the center of the bounding box marks the center

Select Styles

1. Select **AOI -> Styles** from the Viewer menu bar.

The AOI Styles dialog opens.



This dialog enables you to change the style of the AOI display.

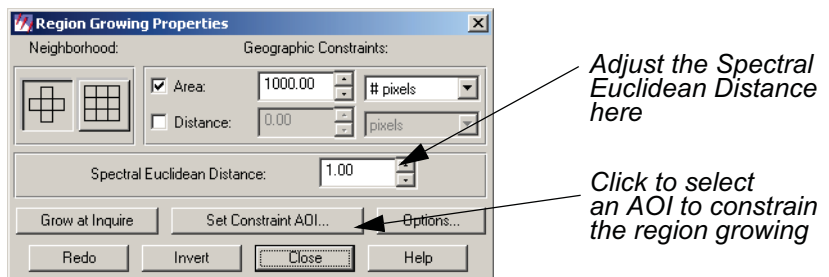
2. Experiment in the AOI Styles dialog with the line widths and colors to find a style that looks best on the displayed image.
3. When you are finished, click **Close** in the AOI Styles dialog.

Set Seed Properties

Do this at a later occasion

1. Next, select **AOI -> Seed Properties** from the Viewer menu bar.

The Region Growing Properties dialog opens.




This dialog enables you to define the region that grows from the seed.

2. In the Region Growing Properties dialog, change the **Spectral Euclidean Distance** to **5.00**.
3. Click **Set Constraint AOI** in the Region Growing Properties dialog.

The Choose AOI dialog opens.

4. In the Choose AOI dialog, select **Viewer** under **AOI Source** and then click **OK**.

5. Click the Region Grow AOI icon  in the AOI tool palette.

Click this tool to plant seeds, or points in the Viewer, from which to grow a regional AOI. The region grows in the Viewer as an AOI that can be selected.

6. Move the cursor into the Viewer window and click the water inside the rectangular AOI to indicate where you want the region growing to take place.

A status meter displays in the status bar of the Viewer. You may click **Cancel** to terminate the region grow process. The meter dismisses when the region growing process is complete. The area you selected in the Viewer is surrounded by a second bounding box and chaser lights.

7. Click **Close** in the Region Growing Properties dialog.

Save AOI

1. Select **File -> Save -> AOI Layer As** from the Viewer menu bar.

The Save AOI As dialog opens. This dialog allows you to save the selected AOIs as a layer (.aoi extension) that can be used again for other functions.

2. Enter a name for the AOI layer under **Save AOI as** (the .aoi extension is added automatically). Pay special attention to the directory where the file is saved, so you can find the layer later.



*If you wanted to save specific AOIs only, you could turn on the **Selected Only** checkbox in the Save AOI As dialog, and only selected AOIs would be saved to a file.*

3. Click **OK** in the Save AOI As dialog.

This layer can now be used in any dialog where a function can be applied to a specific AOI layer. You can also edit this layer at any time, adding or deleting areas.

Arrange Layers

1. Select **View -> Arrange Layers** from the Viewer menu bar.

The Arrange Layers dialog opens.

2. In the Arrange Layers dialog, right-hold over the AOI Layer and select **Delete Layer** from the **AOI Options** menu.

3. Click **Apply** and then **Close** in the Arrange Layers dialog.

ETM of 1999

The file **lanier.img** is redisplayed in the Viewer without the AOI layer.

Adjust Image Contrast

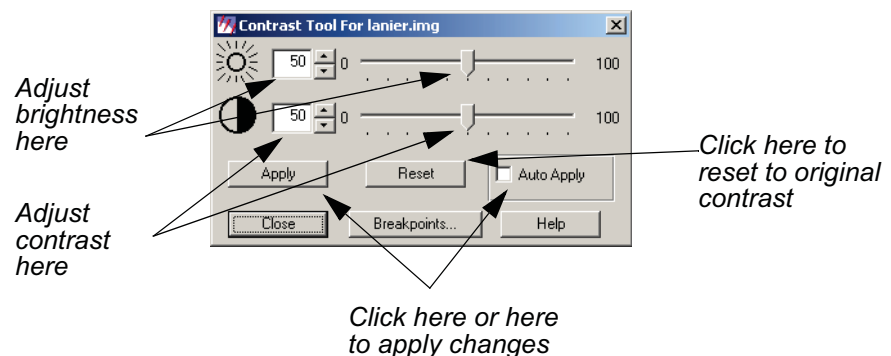
When images are displayed in ERDAS IMAGINE, a linear contrast stretch is applied to the data file values, but you can further enhance the image using a variety of techniques.

ETM of 1999

The file **lanier.img** should be displayed in a Viewer.

1. In the Viewer menu bar, select **Raster -> Contrast -> Brightness/Contrast**.

The Contrast Tool dialog opens.



2. In the Contrast Tool dialog, change the numbers and/or use the slider bars to adjust the image brightness and contrast.
3. Click **Apply**.

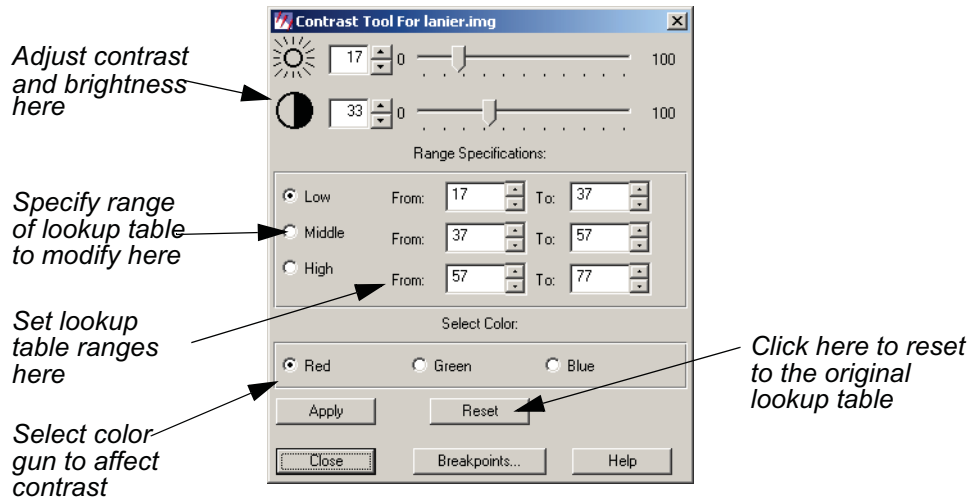
The image in the Viewer is redisplayed with new brightness values.

4. Click **Reset** and **Apply** in the Contrast Tool dialog to undo any changes made to the Viewer image.
5. Click **Close** in the Contrast Tool dialog.

Use Piecewise Linear Stretches

1. In the Viewer menu bar, select **Raster -> Contrast -> Piecewise Contrast**.

The Contrast Tool dialog for piecewise contrast opens.



Read the text

The Contrast Tool

This tool enables you to enhance a particular portion of an image by dividing the lookup table into three sections: low, middle, and high. You can enhance the contrast or brightness of any section using a single color gun at a time. This technique is very useful for enhancing image areas in shadow, or other areas of low contrast.

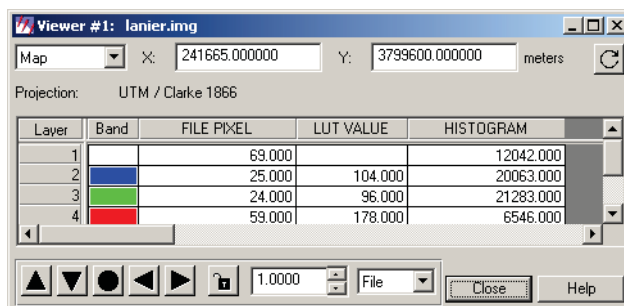
The brightness value for each range represents the midpoint of the total range of brightness values occupied by that range.

The contrast value for each range represents the percent of the available output range that particular range occupies.

As one slider bar is moved, the other is automatically adjusted, so

2. With your pointer over the image in the Viewer, right-hold **Quick View** -> **Inquire Cursor**.

The Inquire Cursor dialog opens and an Inquire Cursor is placed in the Viewer.



3. In the Viewer, drag the intersection of the Inquire Cursor to the lake. Move the Inquire Cursor over the water while keeping an eye on the lookup table values in the blue color gun, as reported in the Inquire Cursor dialog.

This gives you an idea of the range of data file values in the water. You can stretch this range to bring out more detail in the water.

4. In the Contrast Tool dialog, click **Blue** under **Select Color**.
5. Under **Range Specifications**, set the **Low** range **From 34 To 55** and press Enter on your keyboard

Values might be different

6. Drag the Brightness slider bar (the top slider bar) to **50**.
7. Click **Apply** in the Contrast Tool dialog.

The water now has more contrast and shows more detail.

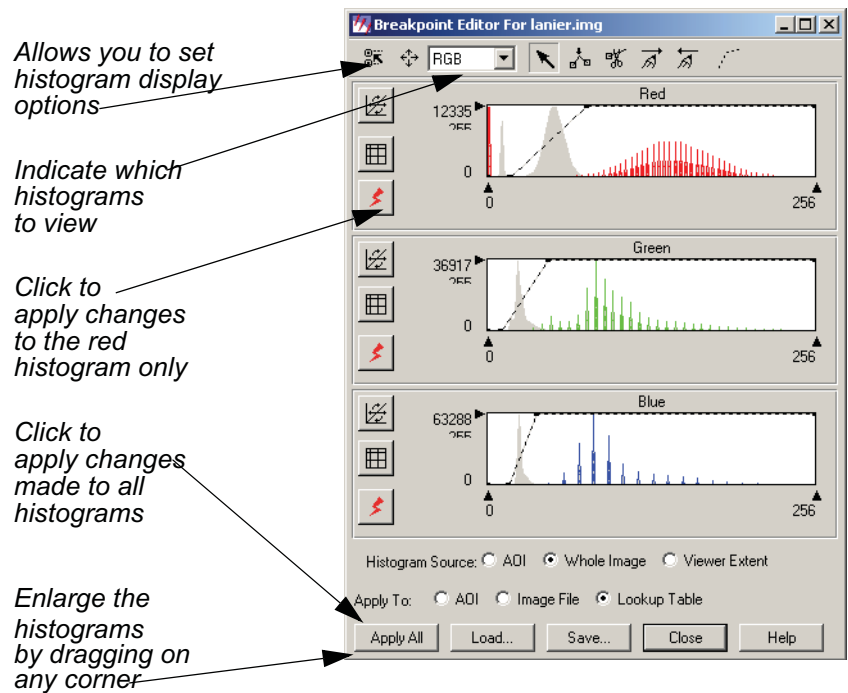
If your image is at a magnification of 1, this new detail may be difficult to see. You can zoom in to a magnification of 2 using the **Quick View** menu in the Viewer.

8. In the Contrast Tool dialog, click **Reset** and then **Apply** to return the image to the original lookup table values.
9. Click **Close** in the Contrast Tool dialog.
10. Click **Close** in the Inquire Cursor dialog.

Manipulate Histogram

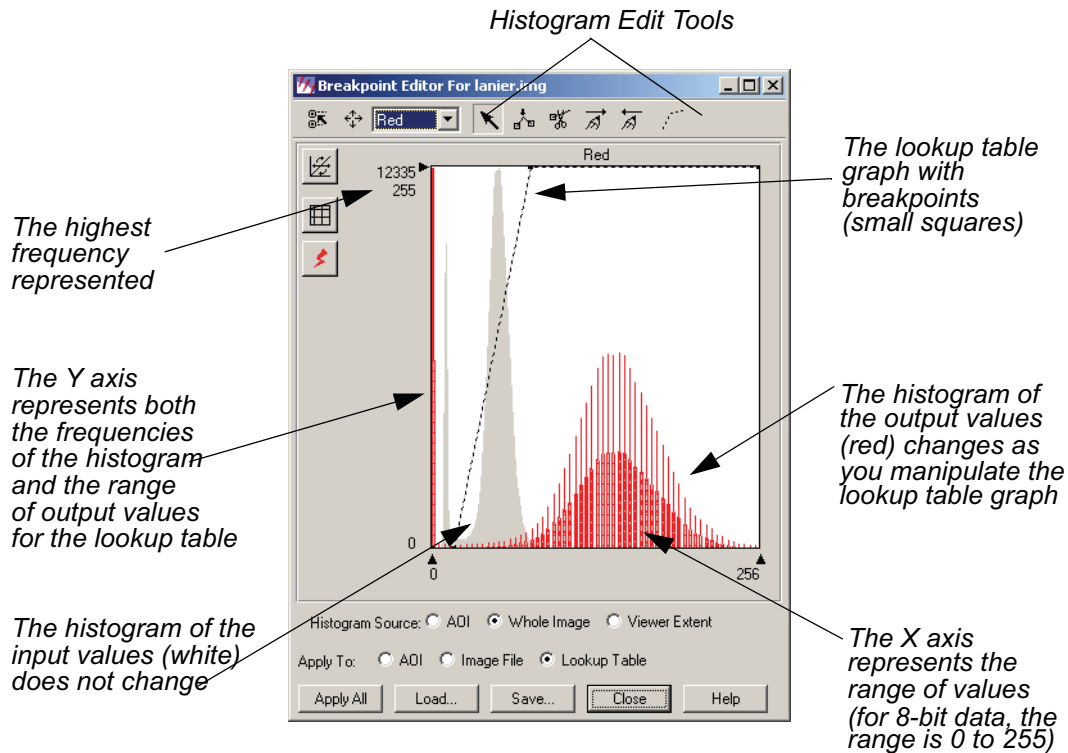
1. In the Viewer menu bar, select **Raster -> Contrast -> Breakpoints**.

The Breakpoint Editor opens.



2. Click the dropdown list at the top of the Breakpoint Editor and select **Red**.

Each of the three histogram graphics in the Breakpoint Editor can be expanded up to full size by selecting the appropriate histogram from the dropdown list at the top of the Break Point Editor. The parts of the histogram graphic are described in the following illustration.




3. Click the dropdown list at the top of the Breakpoint Editor and select **RGB**.

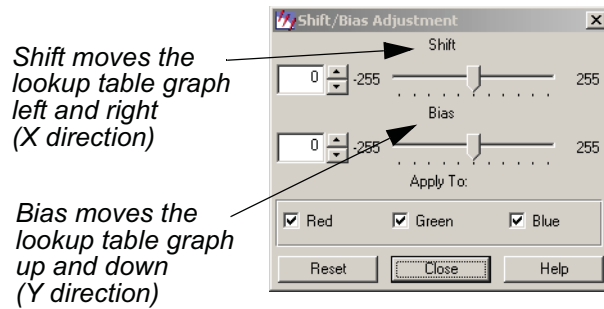
All three histograms redisplay in the Breakpoint Editor.

4. Experiment by dragging the breakpoints of the lookup table graphs in the different color guns (**Red**, **Green**, and **Blue**).
5. Click **Apply All** in the Breakpoint Editor to view the results of your changes in the image.
6. To undo the edits you just made, select **Raster -> Undo** from the Viewer menu bar.

Adjust Shift/Bias

1. In the Breakpoint Editor, click the Shift/Bias icon  on the toolbar.

The Shift/Bias Adjustment dialog opens.



The lookup table graph and the output histogram are updated in the Histogram Tool dialog as you manipulate the information in the Shift/Bias Adjustment dialog.

2. In the Shift/Bias Adjustment dialog, drag the **Shift** slider bar to the right.

Notice that the value in the number field to the left increases as you move the slider bar. This is the number of pixels that the lookup table graph is moved.


3. In the Shift/Bias Adjustment dialog, double-click the number in the **Shift** number field and change the number field to **20**. Press Enter on your keyboard.
4. In the Breakpoint Editor, click **Apply All**.

The image is redisplayed using the new lookup table. It is very dark.

5. In the Shift/Bias Adjustment dialog, return the **Shift** value to **0**.
6. In the Breakpoint Editor, click **Apply All** to return the image to its original contrast.
7. Repeat **step 2.** through **step 6.** using the **Bias** option.
8. When you are finished, click **Close** in the Shift/Bias Adjustment dialog.

Use Mouse Linear Mapping

Do this at a later occasion

1. ~~In the Breakpoint Editor, click the Red Mouse Linear Mapping icon  , which is located on the left border of the Red histogram. The Red Mouse Linear Mapping dialog opens.~~