

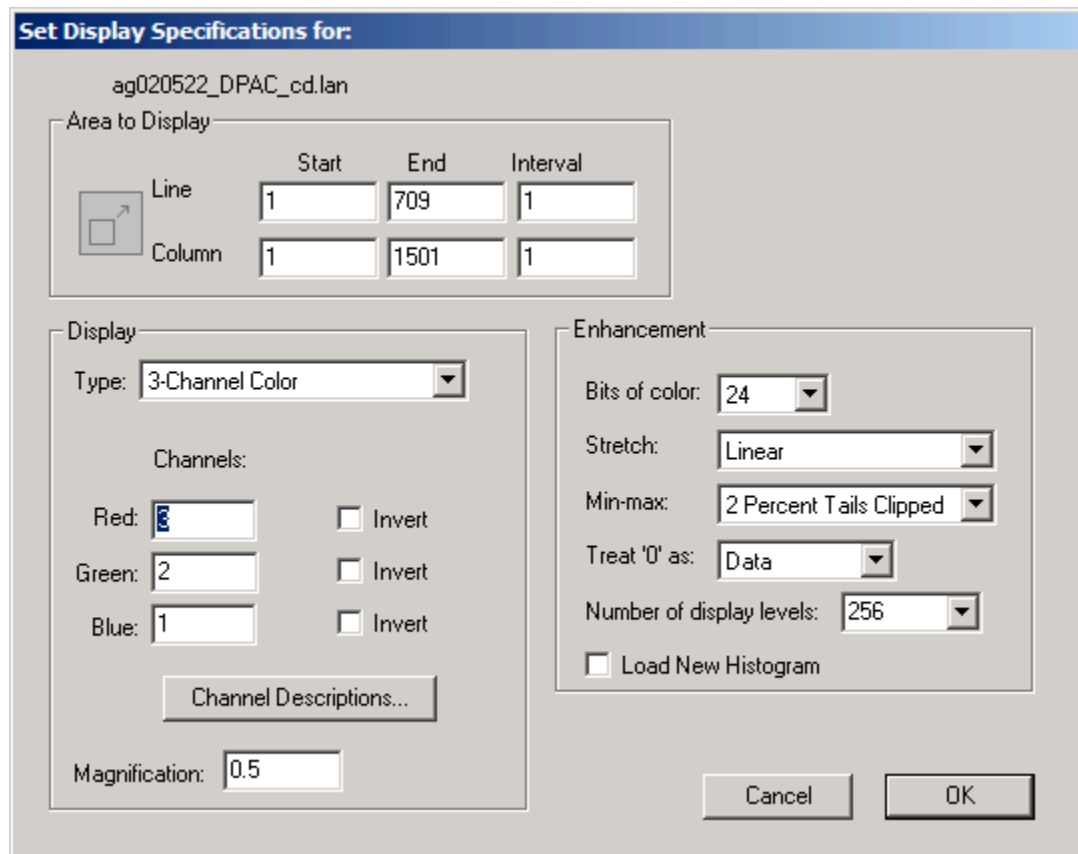
MultiSpec Tutorial: Display and Inspection of Image Data

Requirements: MultiSpec application and image titled “ag020522_DPAC_cd.lan”.

In this tutorial, you will display an aircraft image of a portion of the Davis Purdue Agriculture Center in Randolph County, Indiana and view the data in several ways using MultiSpec.

- 1.1 Start MultiSpec using the icon on the desktop or from MultiSpec in the Startup Menu.
- 1.2 From the **File** menu choose **Open Image. . .** A dialog box will open to allow one to select the data file one wishes to use.
- 1.3 Select ag020522_DPAC_cd.lan in the Tutorial1 folder and **Open**, or simply double-click on ag020522_DPAC_cd.lan

This is a segment (709 lines x 1501 columns of pixels) of a 3-channel image of DPAC collected on May 22, 2002. Next a dialog box will appear to allow one to choose among various options for the image display.



Note that by default, the area designated for display is the whole scene and the **3-Channel Color** Display Type is selected. The default settings call for the Red screen color to be derived from band 3, Green from band 2 and Blue from band 1. These particular choices will cause the screen image to be in a 3-color format approximating Color Infrared film.

Select **OK**.

- 1.4 This step may not occur for all situations. If the data histogram has not previously been calculated and stored (in a .sta file), another dialog box will be presented allowing the choice of regions to be histogrammed, so that the channel data values can be properly assigned to screen colors. The default options built into this dialog box are satisfactory, so Select **OK** to begin the histogramming.

After the histograms of all of the channels have been computed, the information will be saved to a file named “ag020522_DPAC_cd.sta” so that they will not have to be re-computed when needed again.

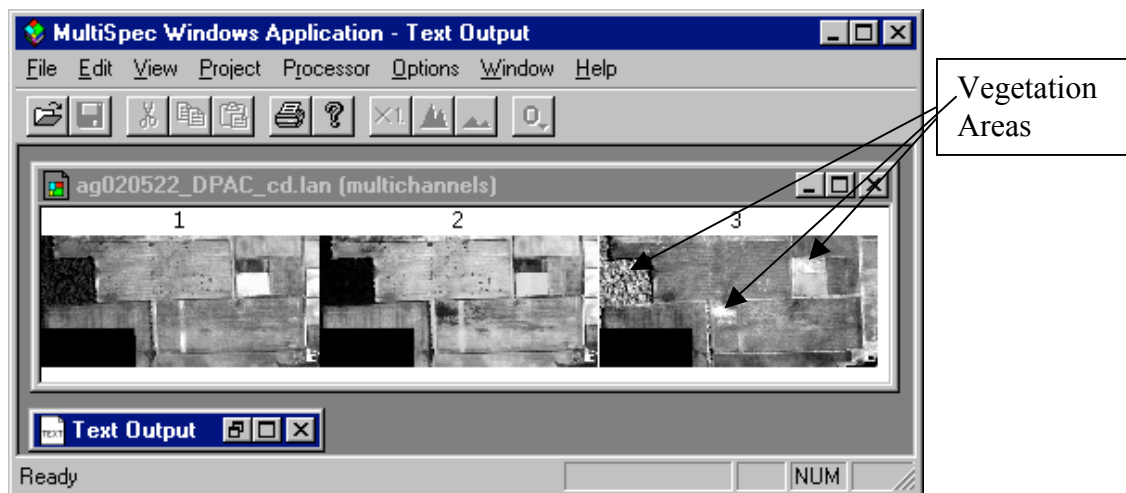
[Note that if a .sta file already exists with the default name, a dialog box will be presented allowing you to overwrite the existing .sta file or save to a different location.]

- 1.5 The image of the data will now appear. Notice that just above the image window in the toolbar there are two small boxes with large and small “mountains”. These are image zooming buttons allowing one to zoom in (large mountain) or out (small mountain) from the current image scale. Just to the left of the image zooming buttons is another button which shows **X 1** in grayed form. This button allows one to go to X1 magnification directly. The current zoom magnification is displayed along the bottom of the MultiSpec application window in the box labeled “Zoom=”.

Some other options are to hold the ‘Ctrl’ key down while zooming to change the zoom step factor to 0.1 instead of 1. In other words, the zoom factor will change from 1.0 to 1.1 to 1.2 etc. instead of 1, 2, 3, etc. (Note that one uses the ‘Option’ key on the Macintosh version to do this.)

One can make a selection within the image by left click-hold in the image window, drag to select a rectangle, and then releasing the left mouse button. If a selected area exists in the image, any zooming will be centered on the selected area if possible. Clear selection using the “Delete” key.

- 1.6 Next one can view a side-by-side channel display for data quality inspection. From the **Processor** menu, select **Display Image...** to bring up the display dialog box. Then select Display Type “Side-by-Side Channels”, and select OK to display all three channels in the image side by side.

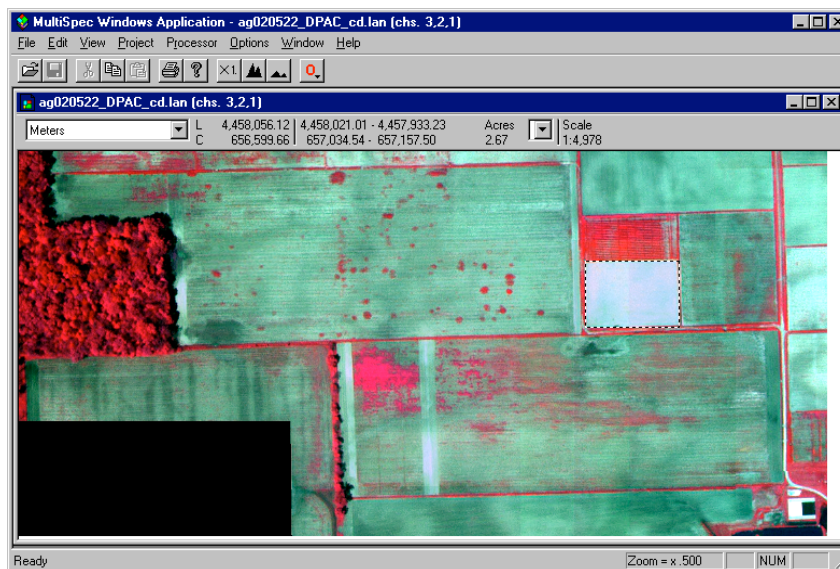


The above image window will be displayed (after zooming out) which shows all three channels displayed side-by-side. Note that the vegetation areas in channel 3 are brighter than the same areas in channels 1 and 2.

The side-by-side channel display is a good way to verify that the channels are registered correctly. In other words, the same location in the image is at the same pixel location in all channels. To do this, select an area in one channel near a field intersection. This same selected area will be drawn in all of the channels. One can then verify that the selected area is at the same location in each channel.

Redisplay the 3-channel image with channels 3, 2 and 1 as Red, Green and Blue.

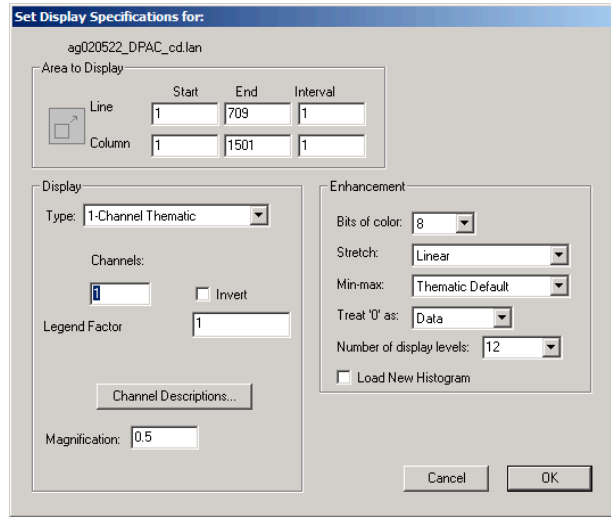
- 1.7 **Coordinate View.** One can also display a “coordinate view” along the top of the image to present the cursor (mouse) location and selected areas in the image. To do this, select the **View->Coordinate View** menu item in the Windows version of MultiSpec [or select the **Window->Show Coordinate View** menu item in the Macintosh version].



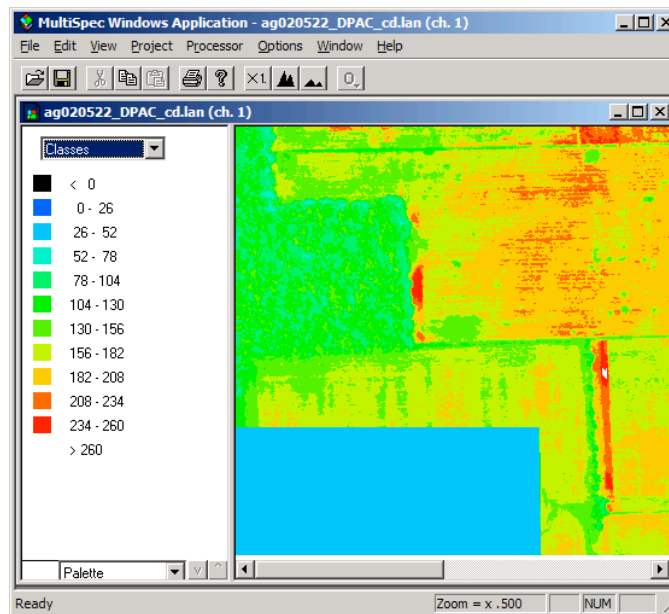
If map coordinate information exists for the image, one can display the coordinates as map units. Use the popup menu on the left side of the coordinate view to select the map units. The area of the selection can be displayed as the number of pixels or in units of acres, hectares, etc using the popup button to the left of “Scale”. The scale of the image will also be displayed.

For this image, if one selects the **Edit->Image Map Parameters...** menu item and set the UTM Zone to 16 and the Datum to “WGS 84” and then select OK; one can also display the cursor coordinates as latitude-longitude. Note that the format that this image file is stored in (ERDAS *.lan) does not allow for storage of this information. Other image file formats such as GeoTIFF do.

1.8 The 1-channel Thematic display type is useful to display "product" type images such as MODIS NDVI or any of the other many MODIS products.



The data values are grouped into the desired number of levels and a legend is displayed to the left of the image indicating which palette colors are associated with each range of data. (See illustration below.) One can also enter a factor to multiply the data values displayed in the legend by to reflect the actual measurement unit. Sometimes the data value may be the measurement value times 100 or 1000. One can use the Min/Max User Specified dialog box item to set the min and max values for the range of data to be displayed. Black is the default color for data values less than the minimum and white is the default color for values greater than the maximum. (Note: This feature can be considered as a supervised 1-channel levels classifier.)



One can use the Reformat - Change Image File Format processor to create thematic images based on what is displayed in the image window.

Concluding Remarks

There are many other operations that one can do with MultiSpec including several Reformatting processes. See other tutorials or the MultiSpec Introduction at the MultiSpec web site for more information. The MultiSpec web site is: <http://engineering.purdue.edu/~biehl/MultiSpec/>. Or contact Larry Biehl at biehl@purdue.edu with questions.