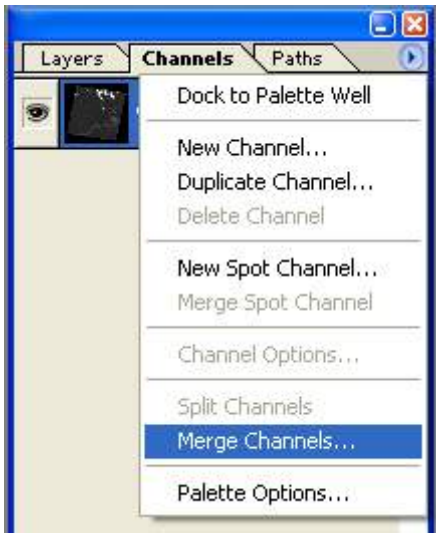
Viewing Landsat Imagery in Photoshop

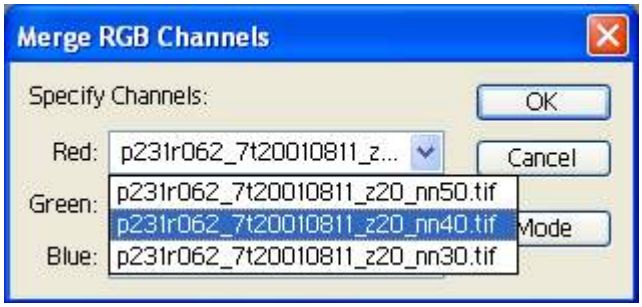
Creating an RGB from a single band (Geo)TIFFs Landsat TM image

1. Open the three single-band images that will be used to create an RGB image. Use the *File => Open* command to open each of the single-band images. We will create an RGB composite using channels 4, 5, and 3 assigned to red, green, and blue channels respectively. Open channels 3, 4, and 5 of your Landsat TM image.
2. Go to the **Channels** window. If **Channels** is not visible, then navigate to and click *Window => Channels*.
3. Click on the arrow to the right of the word **Channels** and a drop down menu appears.
4. Click on the *Merge Channels…* selection near the bottom of the menu.



5. The **Merge Channels** window appears. In **Mode**, select *RGB*, and make sure **Channels** is set to 3. Click *Ok*.

6. Now specify the channels. Select Landsat TM channel 4 for the “Red” color channel, 5 for “Green”, and 3 for “Blue”, for a 4-5-3 RGB image. Click *Ok*.



7. Repeat steps 1-6 for any other band combinations you would like to view.

Opening and displaying a multiband (Geo)TIFF Landsat TM image

1. Open the file using *File* => *Open* and then navigate to the multiband satellite image (Geo)Tiff file. This will open all of the image bands and will display the first three.
2. Click on the ***Channels*** tab on the **Channels** window or select *Window* => *Channels*. This will display the individual bands in sequential order. The default behavior is to display the first three bands (bands 1,2, and 3) as an RGB image.

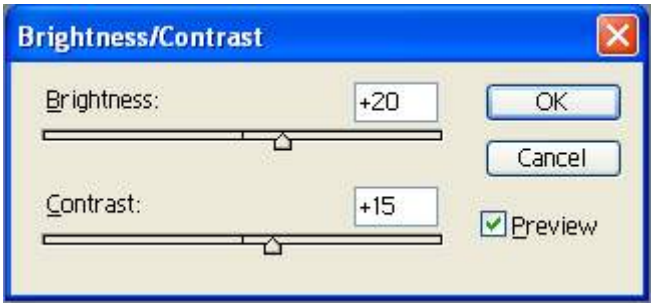
3. To create another RGB image first determine the appropriate size for the new window.
    a. Click on the opened image and then select *Select* => *All* to select the entire image. Copy the selection using *Edit* => *Copy*. Next, click on *File* => *New*.

b. Type in the name of your choice in the "Name" text box at the top of the **New** dialog window. The correct image dimensions should appear in the dimension text boxes but if they do not then select "Custom" in the ***Preset Sizes*** dropdown list, and enter ***Width*** and ***Height*** values equal to the original image dimensions in pixels.
c. The "units" dropdown menu next to ***Width*** and ***Height*** should be set to "Pixels". Set ***Mode*** to "RGB Color." The ***Resolution*** setting can be set as you like. Click ***OK*** to open the window.

4. Click on the original image to make it active. Click *Select* =>*All*. Next, in the **Channels** window click on the image icon for the "Alpha 1" channel since this is the band to be copied. Copy that image by selecting *Edit* => *Copy*.
5. Click on the new image and then in the **Channels** window (click on the ***Channels*** tab if this is not visible) click on the "Red" image icon to select that channel as the one in which the band will be pasted. Select *Edit* => *Paste* and a copy of the 'Alpha 1" channel from the original image should appear in the new image.
6. Repeat steps 4 and 5 to Copy the "Alpha 2" channel from the original image and *Paste* it into the "Green" channel in the new image. Repeat for “Blue”.
7. Click on the box to the left of the "RGB" image icon. The RGB image representing Landsat TM channels 4, 5, 3 is displayed in the new image window.
8. To modify the output RGB image simply *Copy* the desired channels from the original image and *Paste* them into the channel of your choice for the new image.

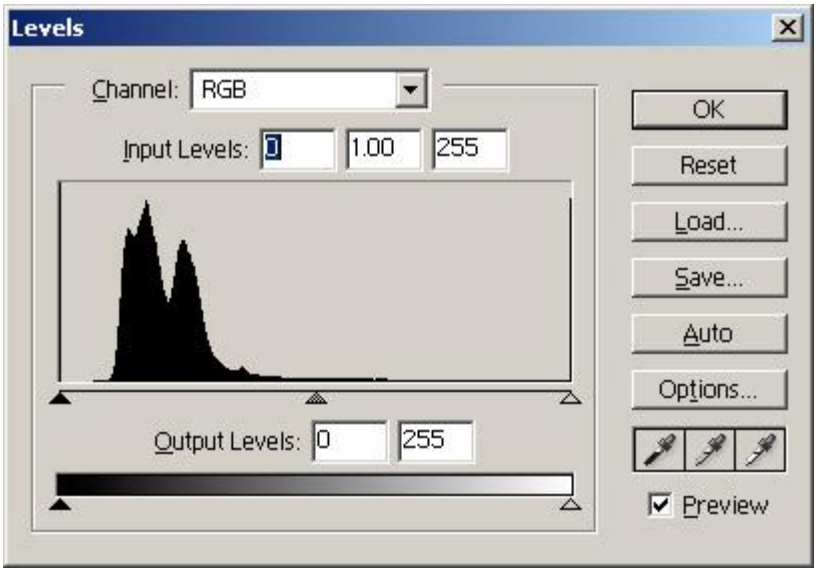
Enhancing brightness and contrast in Landsat images

Choose *Image* => *Adjustments* => *Brightness/Contrast*. Make sure that the *Preview* box is checked, which will allow you to view changes as you make them. Then move the slider for brightness to the right to make the image brighter. Move the contrast slider to the right to make the contrast stronger.



Enhancing the color in Landsat images

1. Click on the RGB image to make it active (make sure the "RGB" channel is selected in the **Channel** selector window) then select *Image* => *Adjustments* => *Levels*. Make sure there is a checkmark next to the ***Preview*** checkbox.



2. To modify all 3 channels at the same time make sure "RGB" is displayed in the ***Channel*** dropdown box. Be sure the ***Output Levels*** text boxes have values of "0" entered in the left box and "255" entered in the right box.
3. The "X" axis of the histogram represents the pixel values for all three channels of the image with the extremes being "0" (on the left) and "255" (on the right). The triangles under the histogram show how the input values are mapped (stretched) to the output range of "0" "255."
4. Move the leftmost (black) histogram triangle to a position just to the right of where the histogram starts. Move the rightmost (light gray) histogram triangle to a position just to the left of where the histogram ends. Detail in the image should be enhanced.
5. Continue moving the histogram triangles (including the middle triangle) until you have an image where you can easily differentiate the features of interest.
6. A more flexible way to enhance an image is to modify the Red, Green, and Blue channels independently. Click on ***Channel*** dropdown box and select "Red" from the list.
7. Repeat step 4 above to make an initial enhancement to the image.
8. Select the Green channel from the ***Channel*** dropdown list. Repeat step 4 above to prepare the Green channel. Repeat for “Blue.”
9. Iteratively modify each channel until the image looks the way you want.