

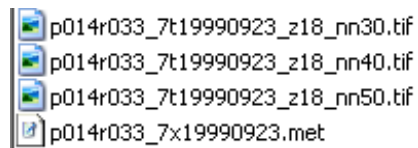


# How to make an image (.img) file and extract water and vegetation for a clutter (.sol) file from Landsat7 data

## Image Creation

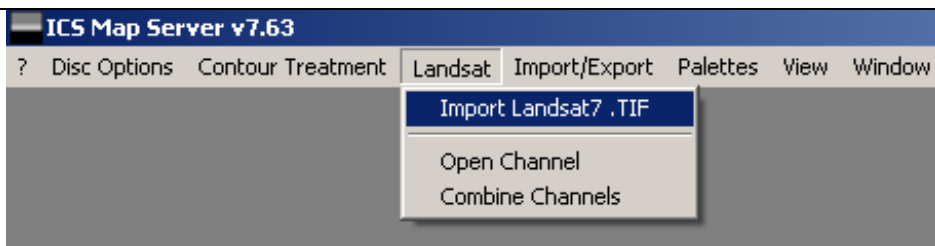
1. It is required to have at least layers 3,4,5 of the Area Of Interest (AOI) downloaded from the Landsat website <http://glcfapp.umiacs.umd.edu:8080/esdi/index.jsp>

On your working folder you should have these files :

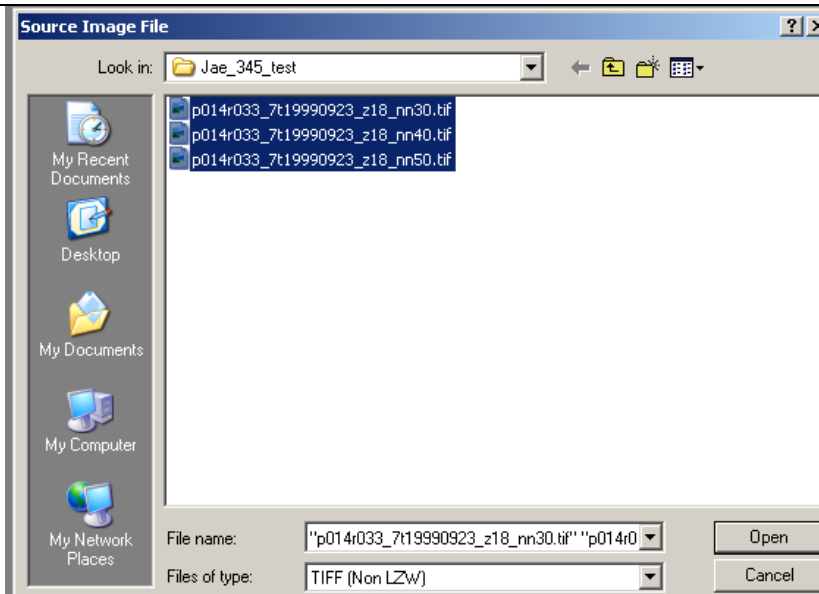


2. *Converting Landsat TIF images to IC1 8-bit format:*

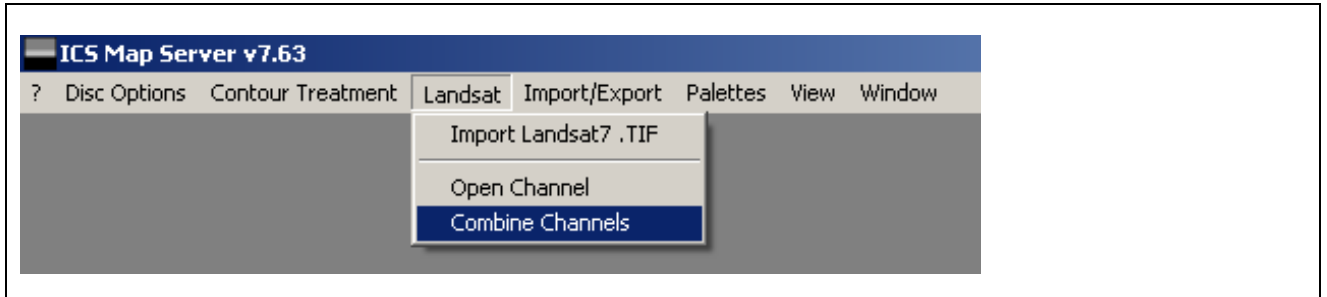
Open ICS Map Server v7.63 or a later version...



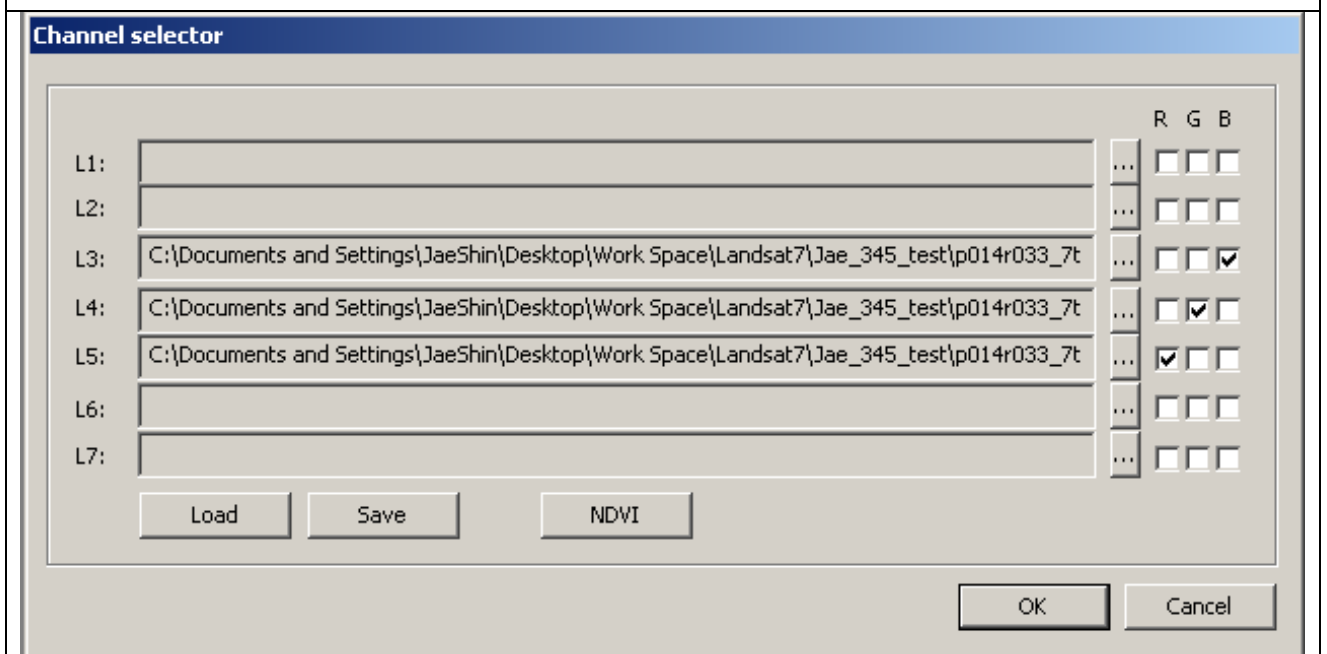
As you can see in the snapshot above, you want to use the import function in the Landsat dropdown menu : Landsat→Import Landsat7.tif.



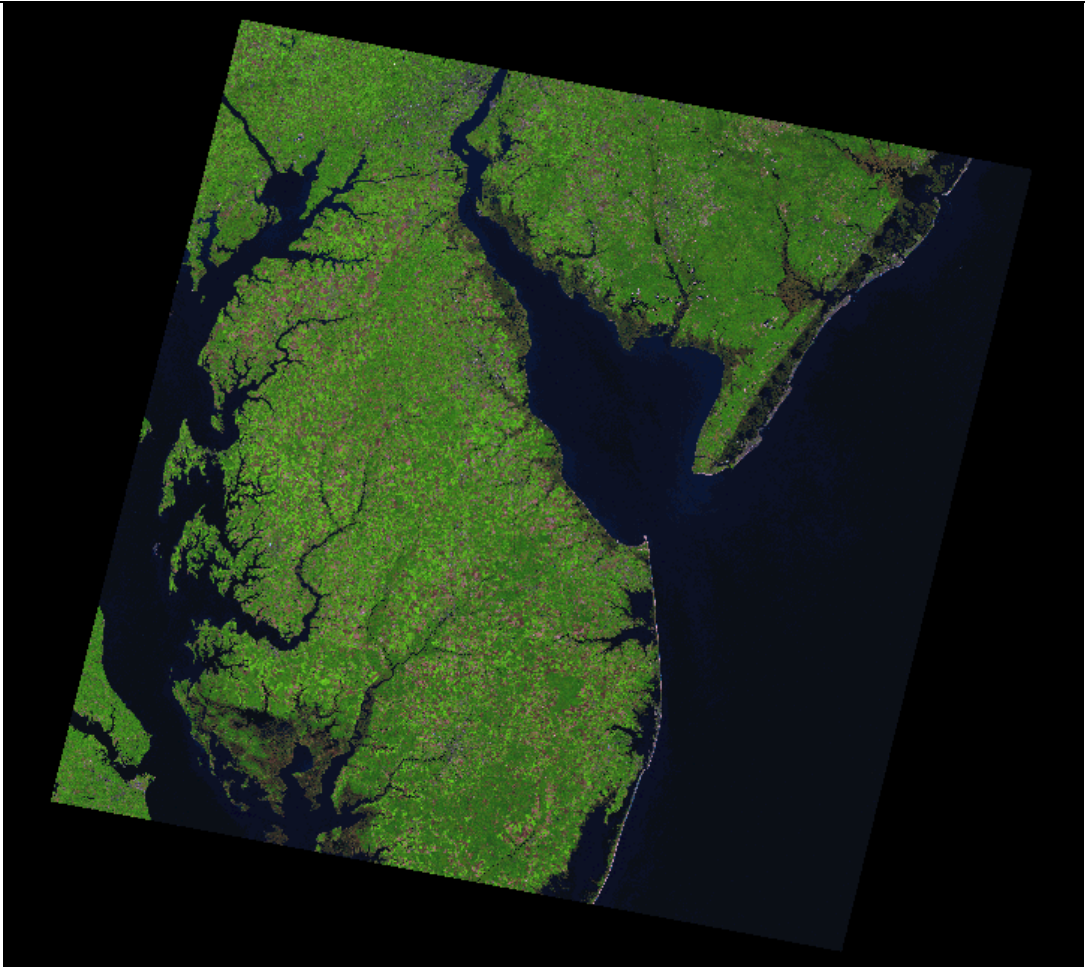
3. Combine Layer 3-4-5 with the Blue Green Red combination




Once again, from the drop down menu, you can combine the Landsat layers : Landsat→Combine Channels.




Select the layers according to the layer combination 3,4,5 that reflect the order Blue, Green, Red and click ok.



Layers 3,4 and 5 are combined according to the BGR color combination.

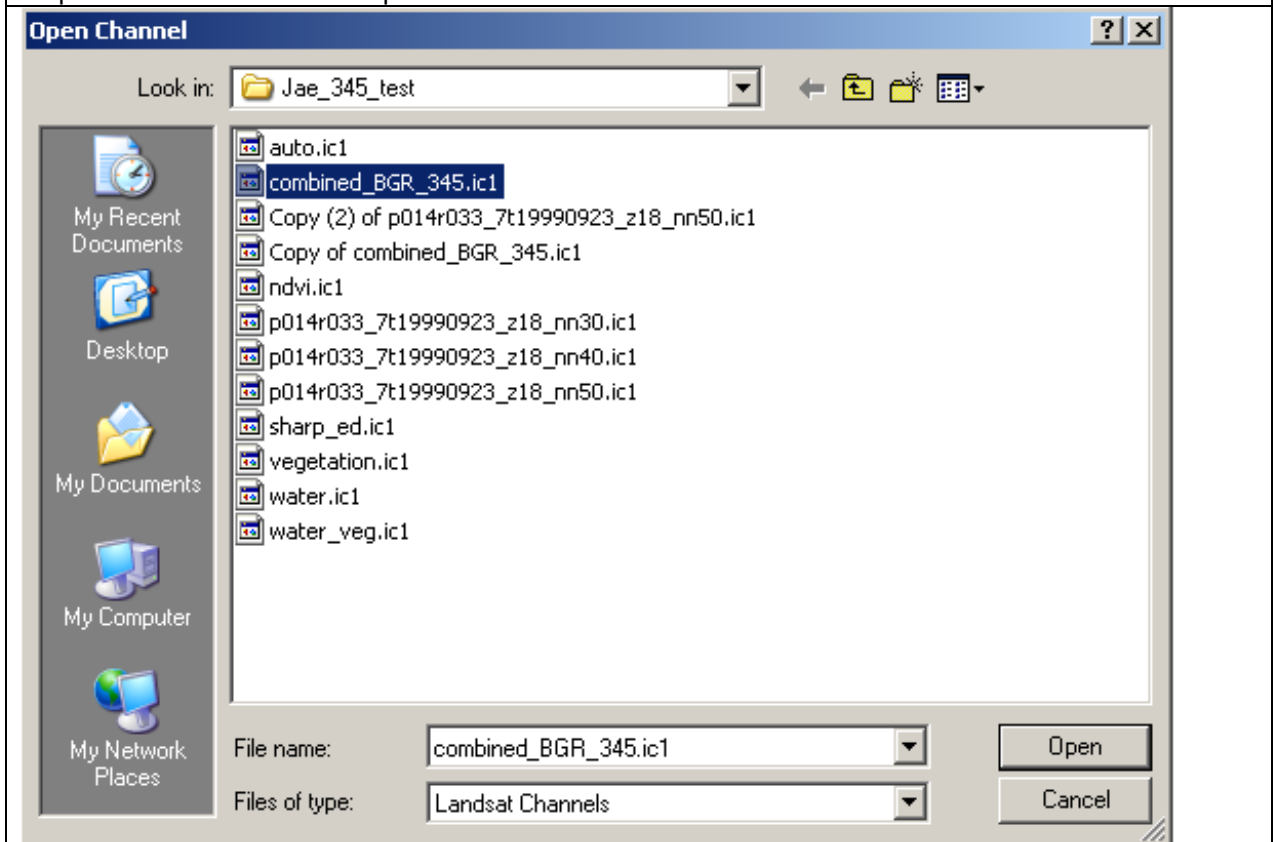
Click on the button  to save this combined channel as a new ic1 file.

Click on the button  to sharpen or add edge enhancement treatment (optional).

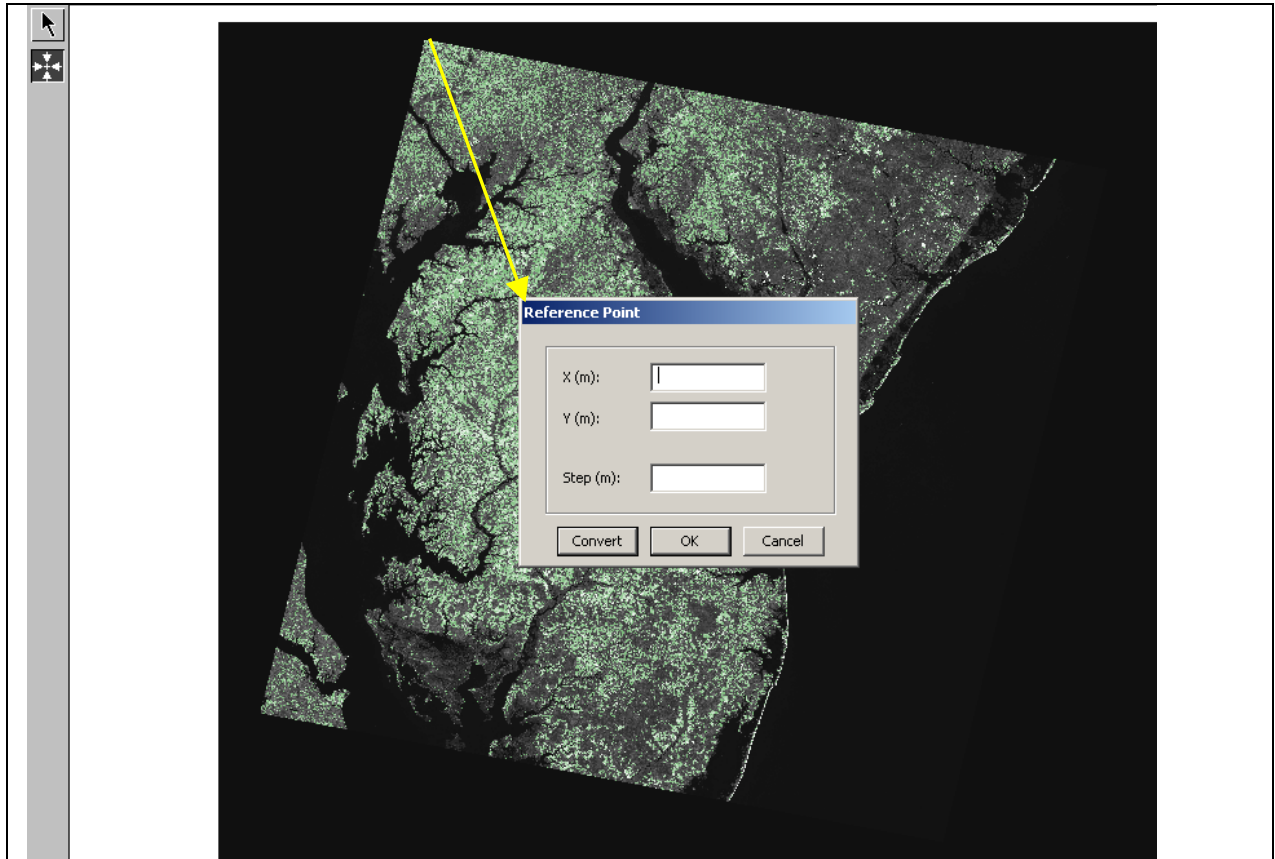
#### 4. Geocoding the channel




As you can see in the image above, you first want to select the Open Channel function in the Landsat dropdown menu : Landsat→ Open Channel



Select the file that is to be geocoded and click open.



Select the button  to set apply a reference point cursor to the upper left corner of the image and input X and Y Upper Left Corner (ULC) values and the step size in meters.

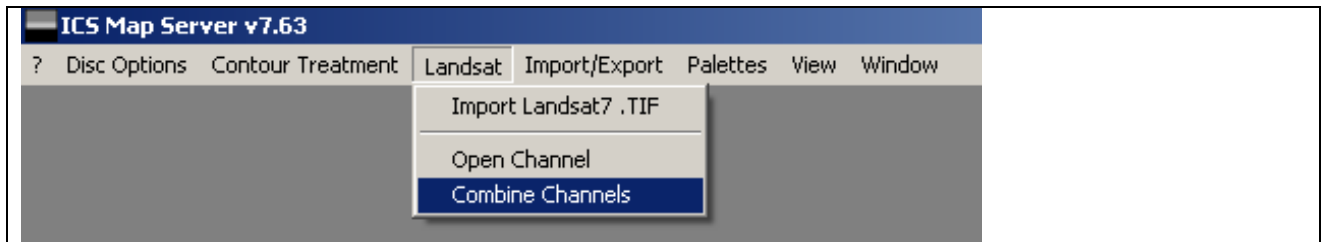
SCENE\_UL\_CORNER\_MAPX = 399684.000  
SCENE\_UL\_CORNER\_MAPY = 4412883.000  
GRID\_CELL\_SIZE\_REF = 28.500 m

This information is given from downloaded source provided that it has a .MET file extension.

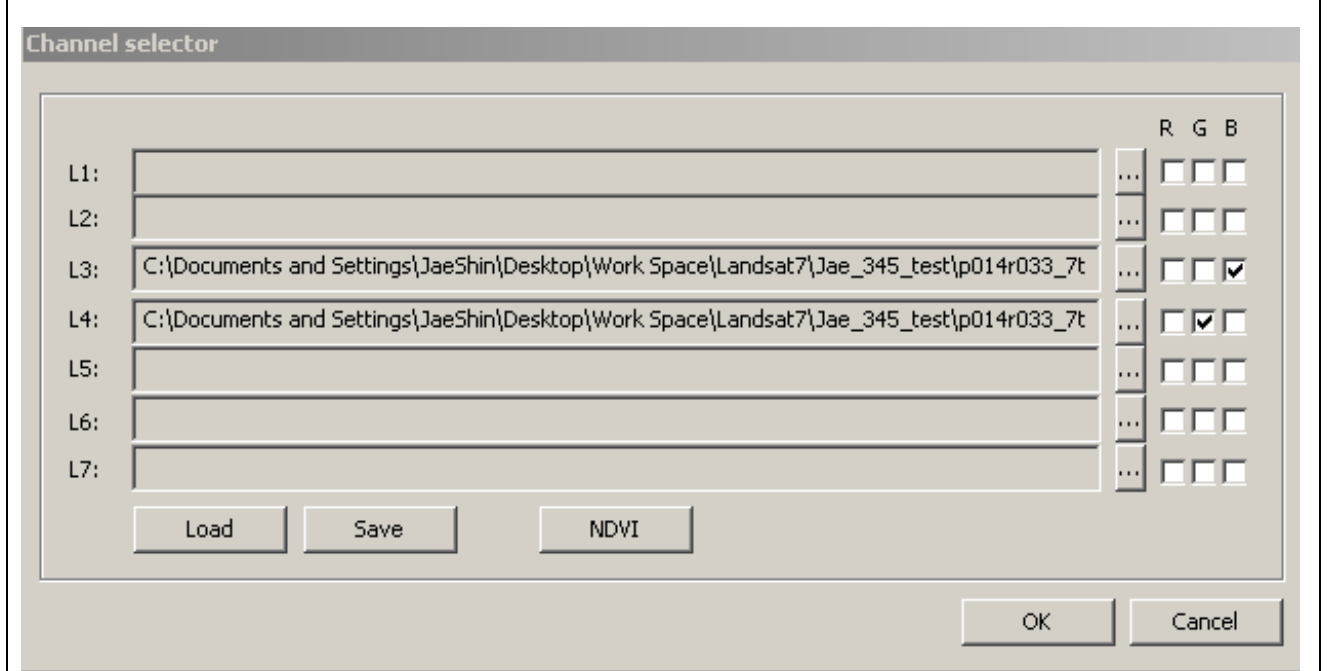
You can now change the file extension to .img and it is a ready to use image file.

## Clutter extraction

### 5. Extracting Vegetation layer



Select : Landsat→Combine Channels again.



Load layers 3 and 4 according to the settings blue and green respectively.

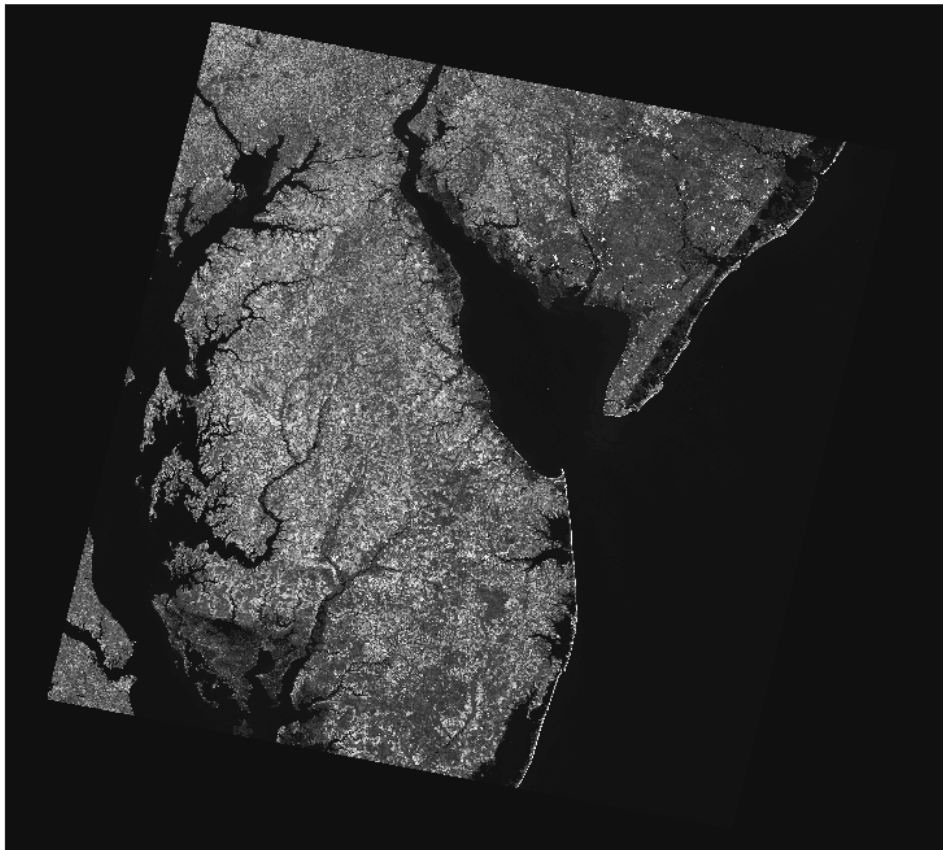
Click on the '**NDVI**' button and click on « ok » to save as an NDVI.ic1 layer.


**Note : this process will take few minutes and it will depend on the processor speed of the computer.**

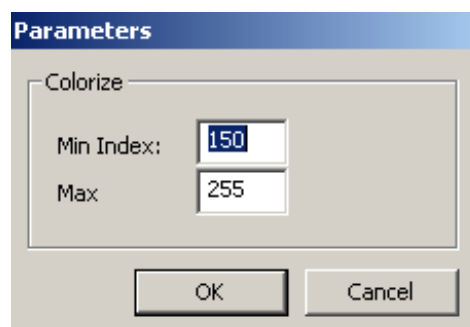
$NDVI = (L4-L3) / (L4+L3)$  (ref : White paper on Landsat7 #WP0402\_L7)

You will have the NDVI.ic1 and NDVI.pal files after this process.

Select Landsat→Open Channel and open the NDVI.ic1 layer to visualize the max/min threshold value to extract NDVI.ic1



Select  button to specify the threshold value. The Min value is normally between 120 to 150 and Max value is 255.



**Parameters**

Colorize

Min Index:

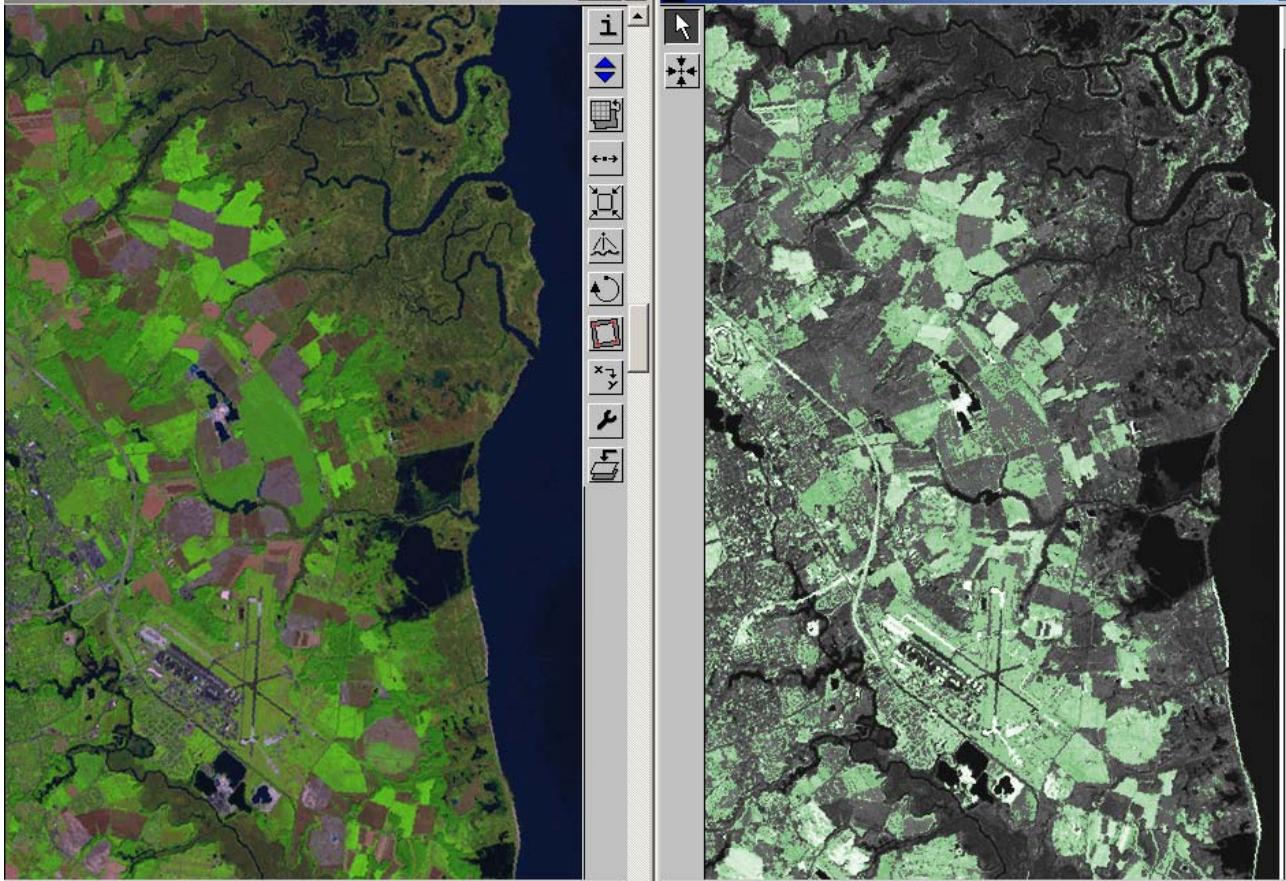
Max:

OK Cancel

This procedure is only done to calculate the threshold value that is going to be used for vegetation extraction.

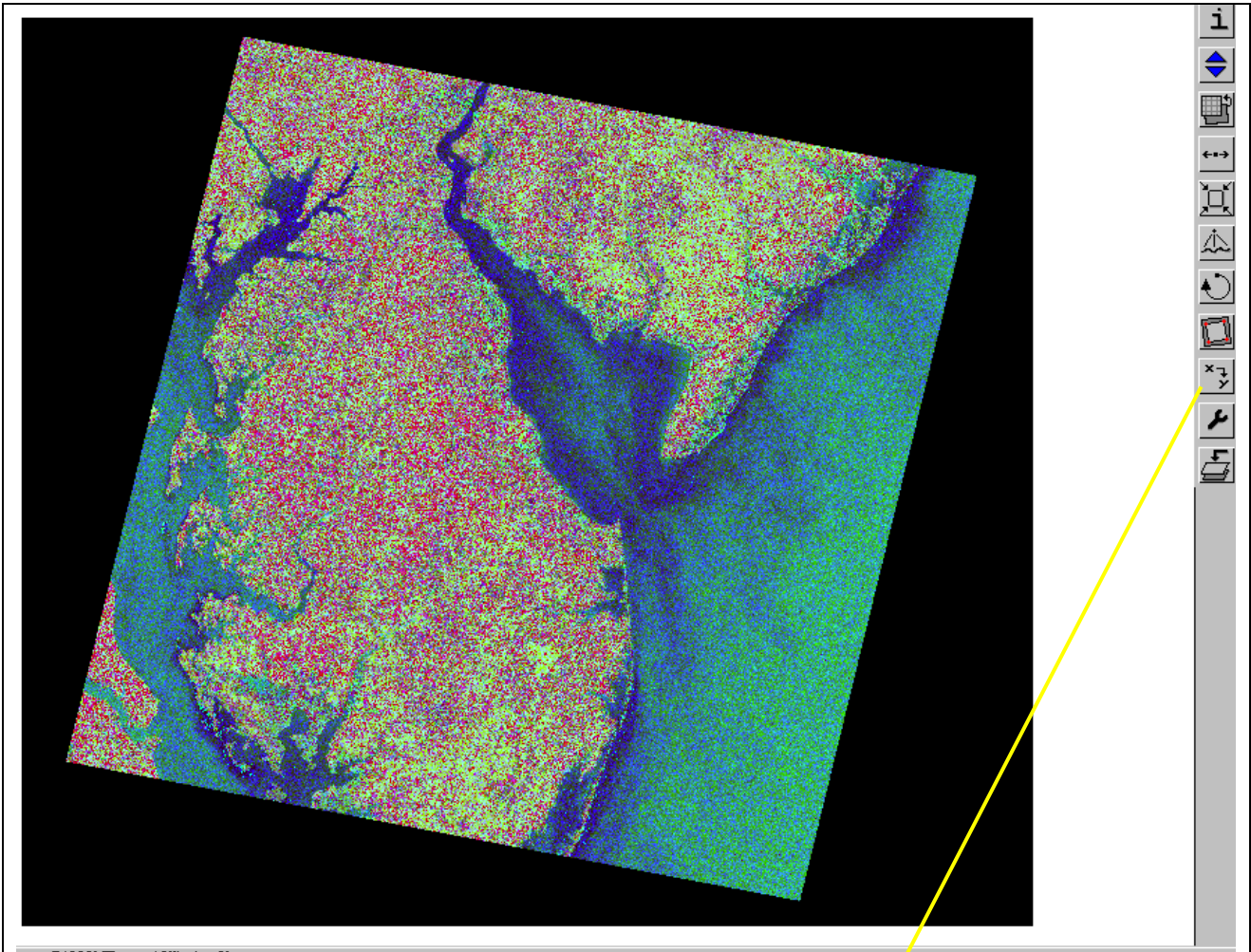
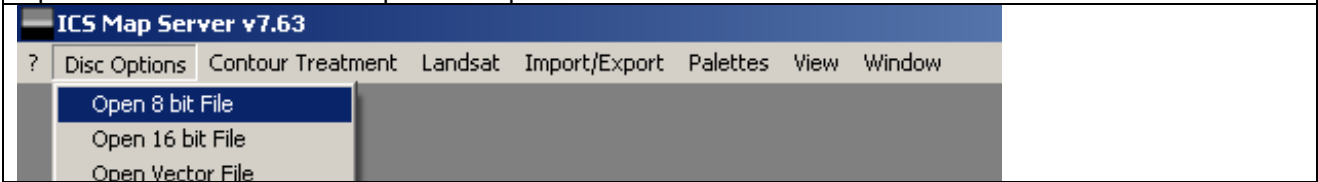
*Note : Press the space bar to update the image*

As a sanity check you can view the combined layer and the NDVI layer that is to be extracted and see if the threshold was correct.



If you have decided on a threshold you are now ready to extract the clutter.

Open the NDVI.ic1 file : Disc Options → Open 8-bit file.



img:549601|Zoom:12||Index:0|

Image of NDVI.ic1



Click on the 'Transform Value Functions' button to extract vegetation

Transform function setting at 150 threshold for vegetation extraction :

- All < 150 to 0 and All > 145 to 5
- 5 is the clutter code for vegetation

5A. First transform All < 150 to 0 transform

**Transform**

One val    All but    All <    All >  

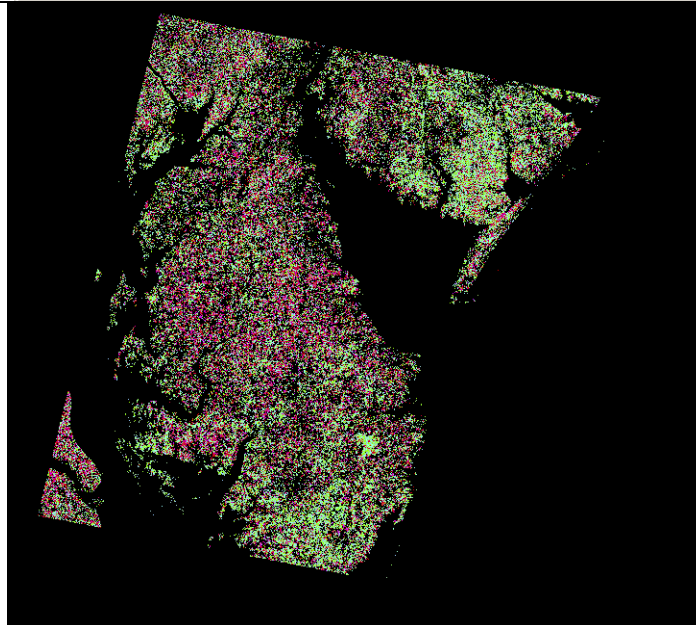
Isolated Points

From lookup table (a,b,...)

+    -    \*    /    %    To

Value :

Ok   Cancel



5B. Transform All > 145 to 5

**Transform**

One val    All but    All <    All >  

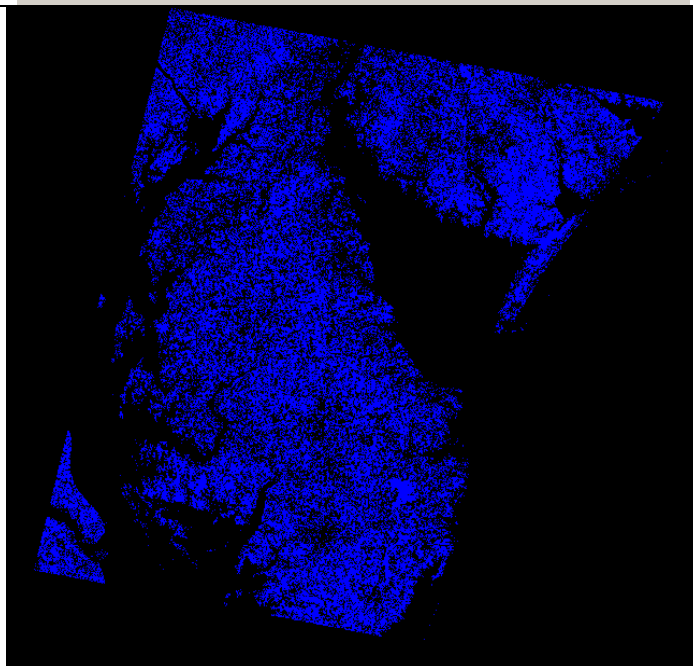
Isolated Points

From lookup table (a,b,...)

+    -    \*    /    %    To

Value :

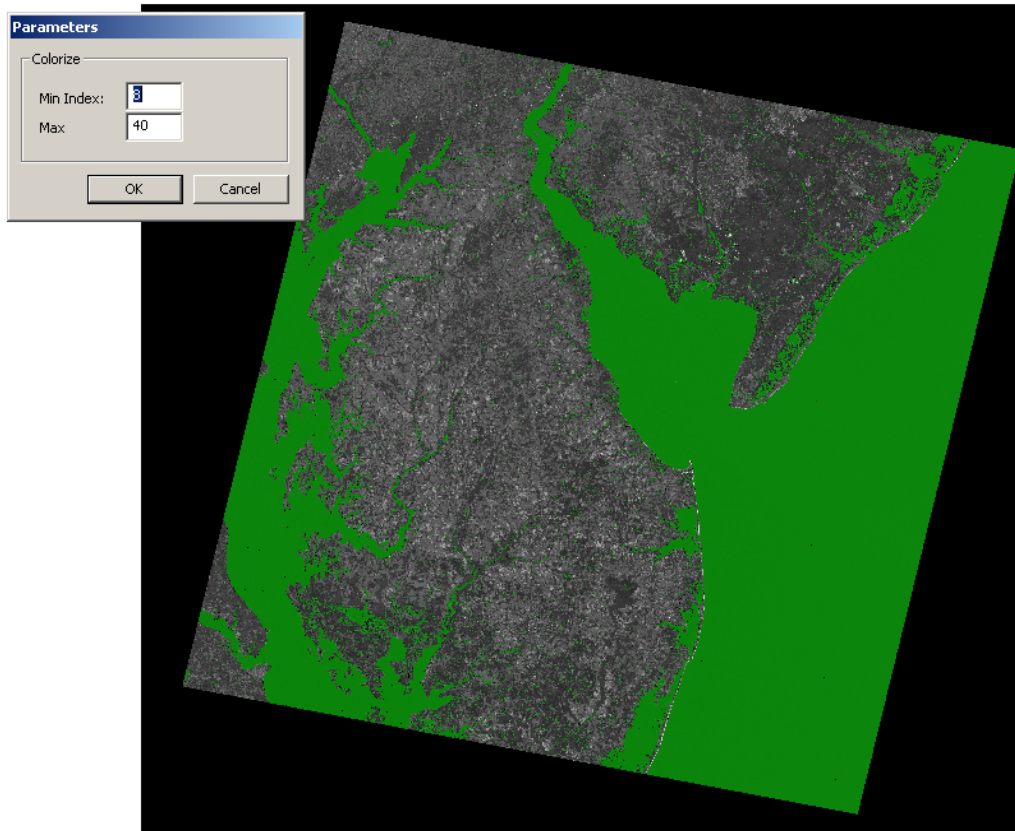
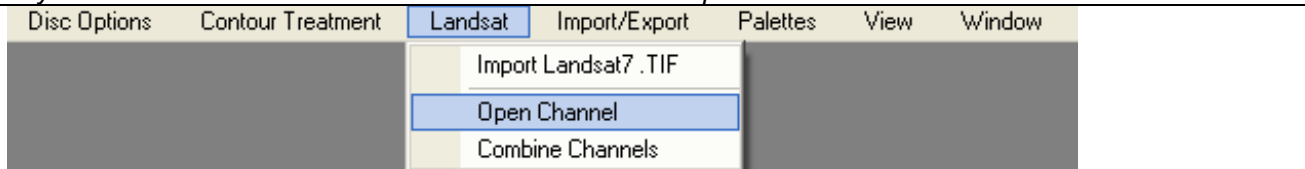


Clutter extraction of vegetation

## 6. Extracting water layer

Use layer 5 or 7 to extract water. The threshold is determined by the open channel function. This extraction is simpler than the extraction of vegetation because it does not reflect infrared.

*Layer 5 has been used for extraction of water for this example.*



Determine the threshold by a good judgement of visualization. The threshold is Min = 8 and Max = 40 for this area.

Transform function setting at 40 threshold for water extraction  
All > 40 to 0  
6 is the clutter code for water

6A. First transform All < 40 to 0 transform

**Transform**

One val    All but    All <    All >  

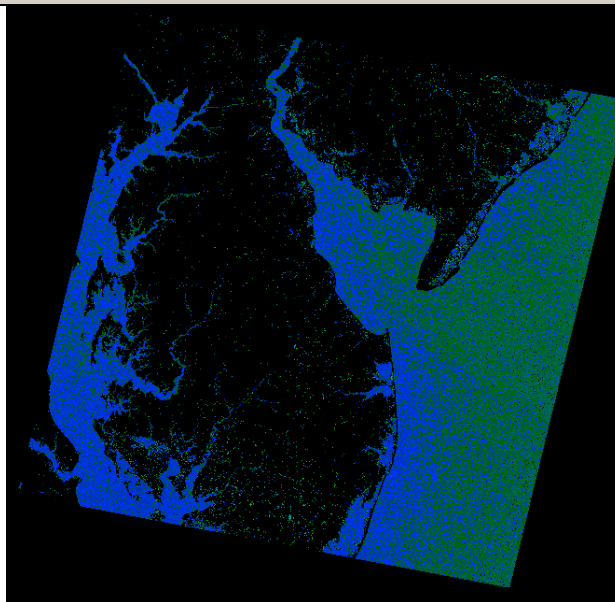
Isolated Points

From lookup table (a,b...)

+    -    \*    /    %    To

Value :



6B. Second, transform All but 0 to 6

**Transform**

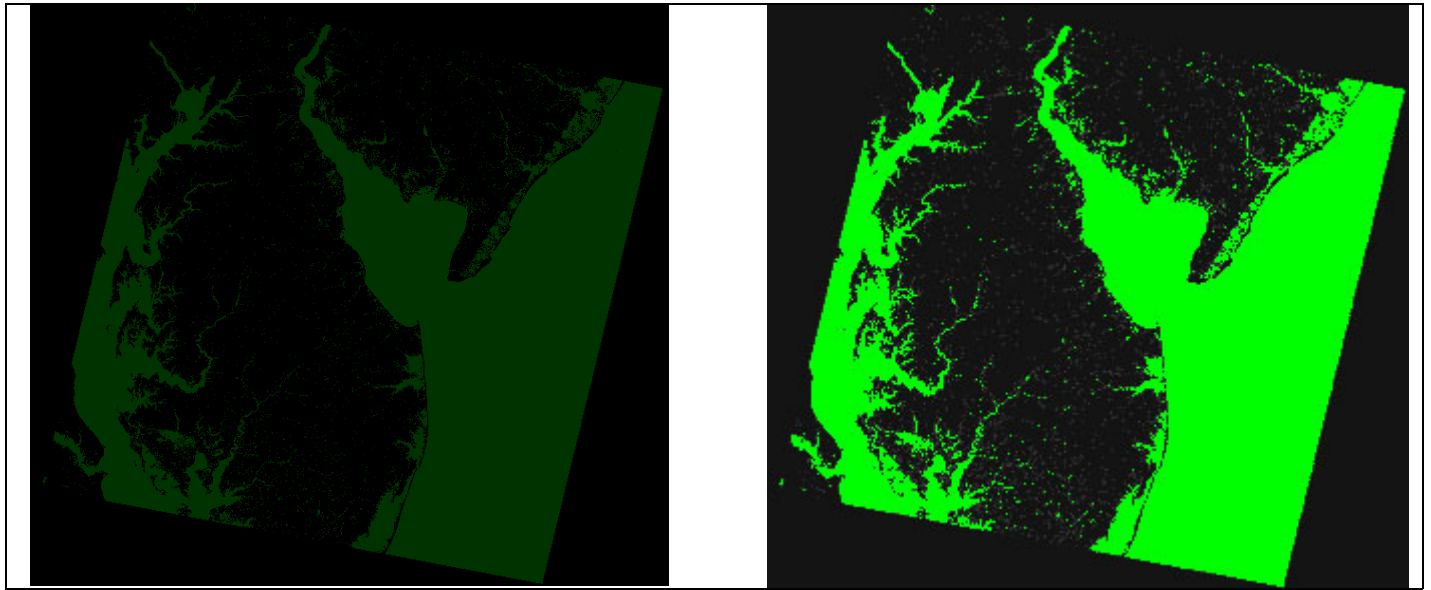
One val    All but    All <    All >  

Isolated Points

From lookup table (a,b...)

+    -    \*    /    %    To

Value :

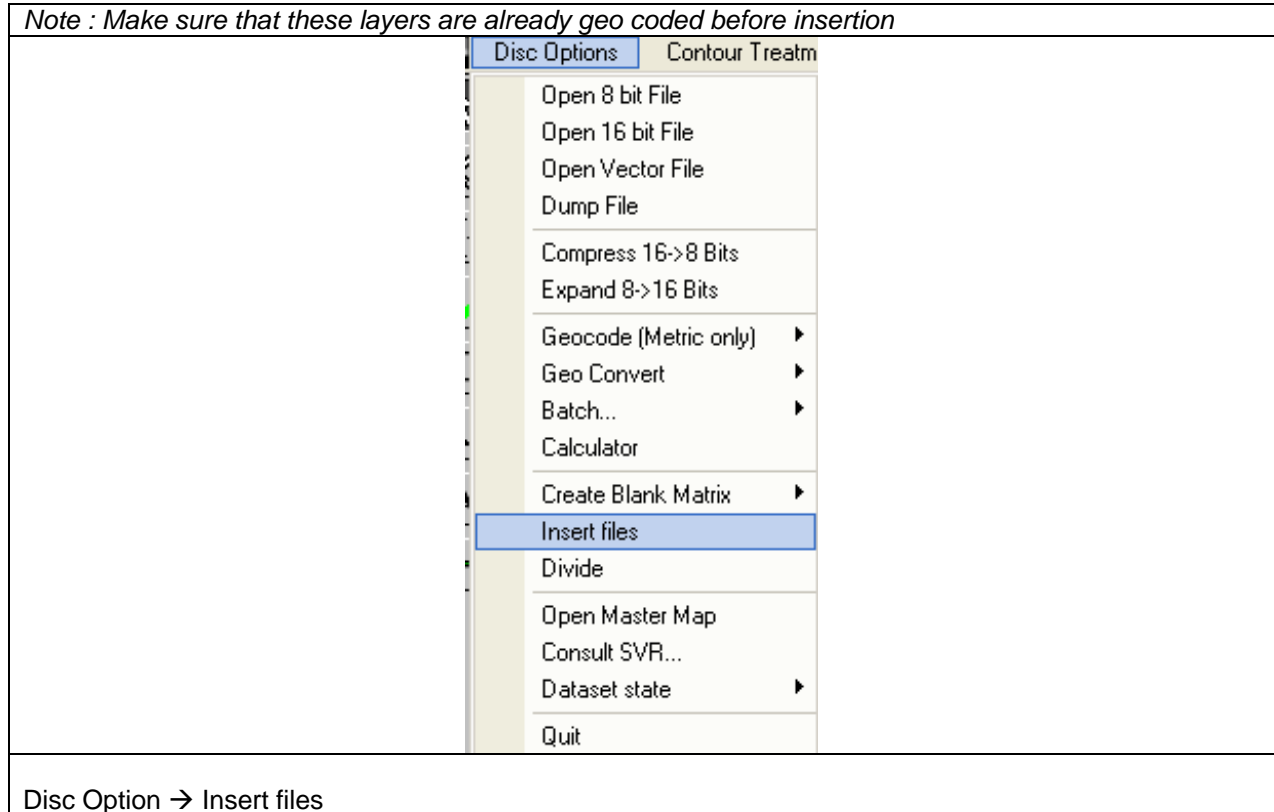


Clutter extraction of water.

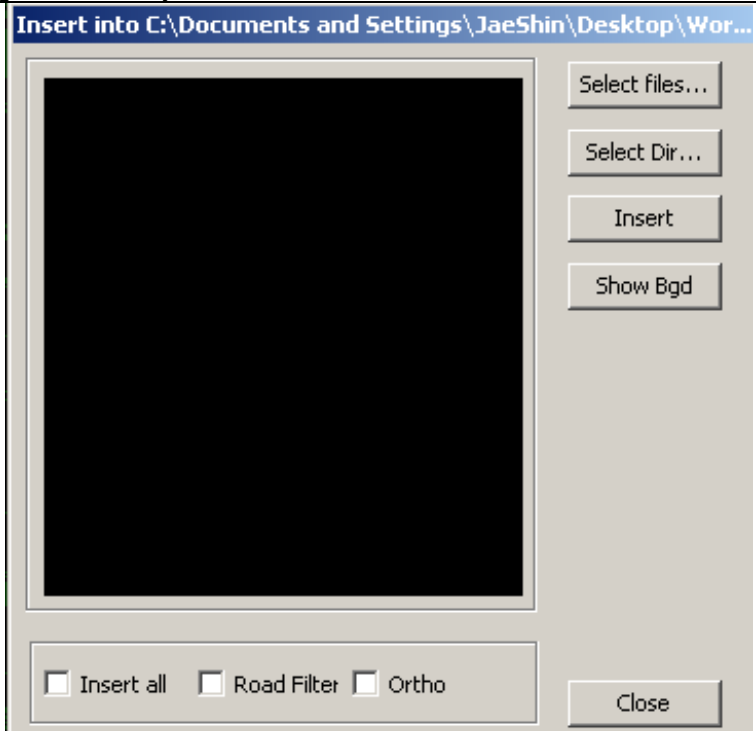
*Note : the image on the right has been treated for contrast for the purposes of this document.*

## 7. Combine Vegetation + Water

*Note : Make sure that these layers are already geo coded before insertion*



Destination file is vegetation.ic1 layer :



Make sure that 'Insert all' is unselected.

Select files→ water.ic1.

Click on **Insert** to combine vegetation and water.

