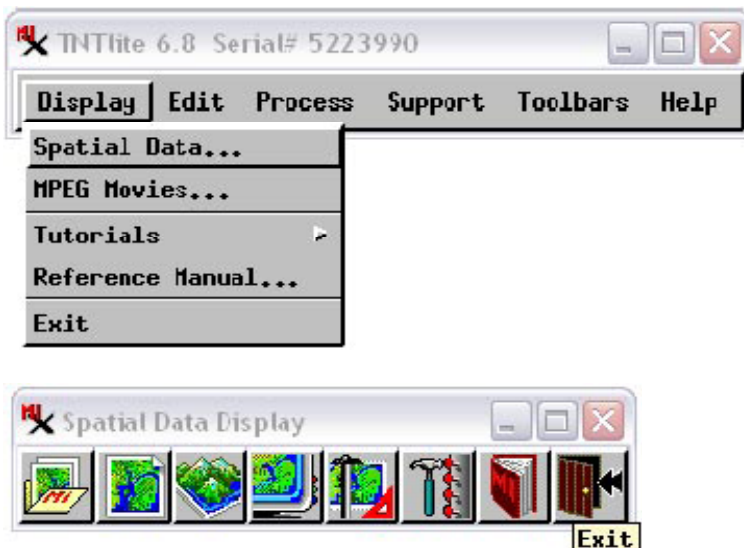


Content of lab session

- 1-DISPLAYING SINGLE BAND RASTER IMAGES
- 2-DISPLAYING MULTI BAND RASTER IMAGES (RGB color composites)
- 3-IMAGE ENHANCEMENT
 - Contrast Enhancement
 - Filtering
- 4-MULTI BAND OPERATIONS
 - Normalized Difference Vegetation Index (NDVI)
- 5-IMPORT /EXPORT VECTOR and RASTER DATA
6. RESOURCES OTHER THAN LAB MANUALS: TUTORIALS AND REFERENCE MANUAL

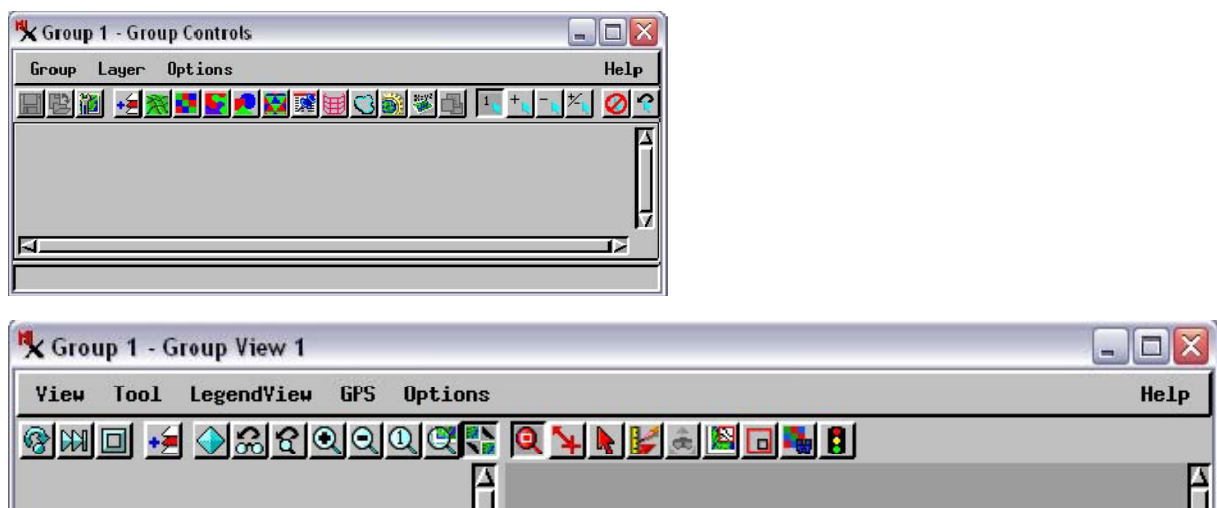
1-DISPLAYING SINGLE BAND RASTER IMAGES

Display> Spatial Data Display>New 2D Grup 



This action opens Group Control and Group View Windows.

The Group Controls window provides tools to add, remove, and examine each layer in the view



To add a raster layer press Add Layer:  in Group control window.

Select the raster object “TM1” by single click on the icon from folder “seyitomer_trim” on the desktop.

This action opens blue band of a Landsat TM imaginary file.

You can view pixel DN (Digital Number) Values by cursor waiting on that pixel.

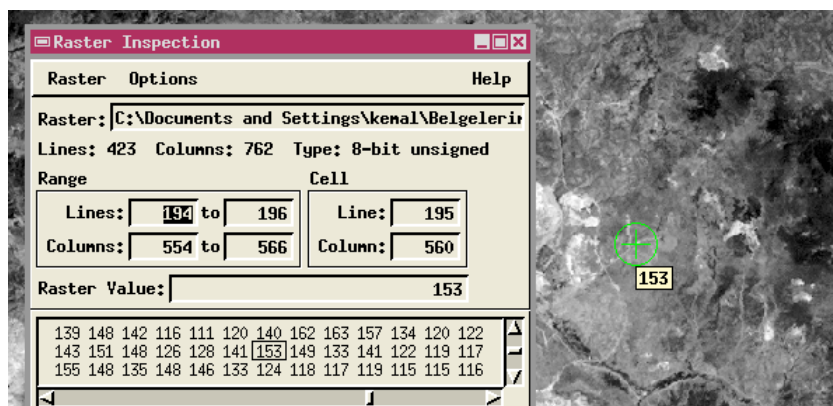
Or,

Group controls > Tool > Examine cell values or **Tool > Examine Raster** These actions open Raster Inspection Window

In this window you can;

-See value (DN) and image coordinates (line, column) of each cell by locating cursor.

-Total number of Lines and Columns (image size)

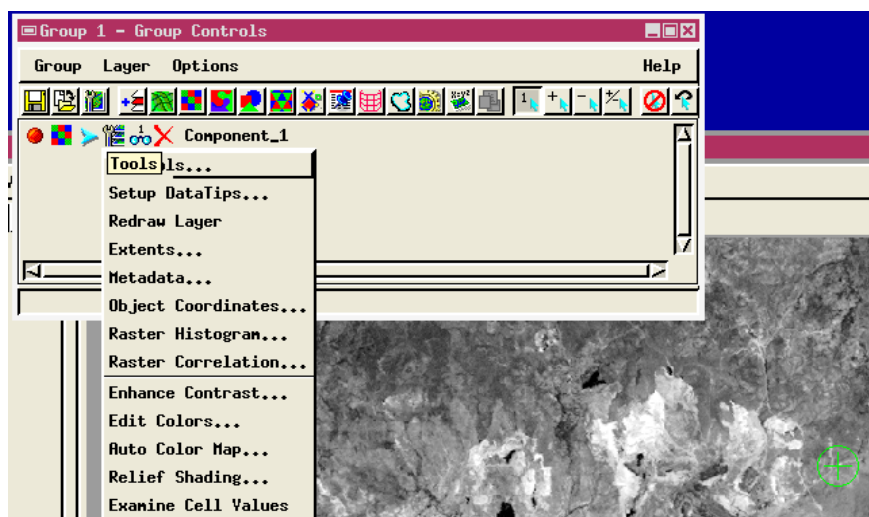


RASTER PROPERTIES

You can see raster properties Such as

-Extents for projection, domain,...

-Raster Histogram for statistics of DN values , by : **Tools>**



2-DISPLAYING MULTI BAND RASTER IMAGES (RGB color composites)

Display> Spatial Data Display>New 2D Grup

To add RGB composite (red- green –blue):

Add raster> quick Add RGB

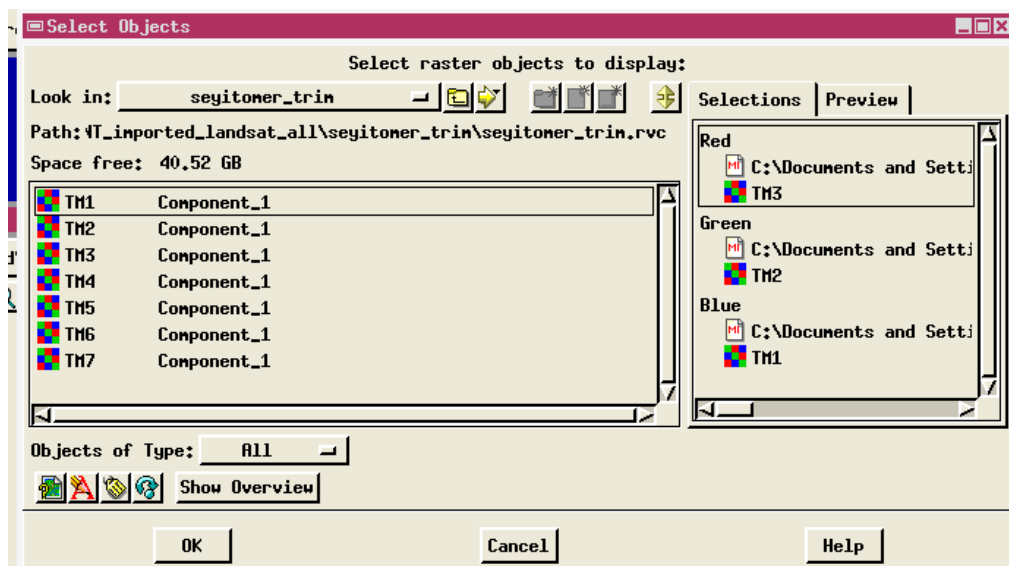
In folder 425_lab_3_RS > seyitomer_trim on the desktop,

Select the file “seyitomer_trim” and by single click on the icon;

Select TM3 to RED **band1 (blue), band2 (green), band 3(red)> TRUE COLOR 3,2,1**

TM2 to GREEN R,G,B

TM1 to BLUE



True color means that the displayed colors are almost the same as the original colors of that features on the earth.

Display RGB False Color as TM4 to RED : TM3 to GREEN : TM2 to BLUE

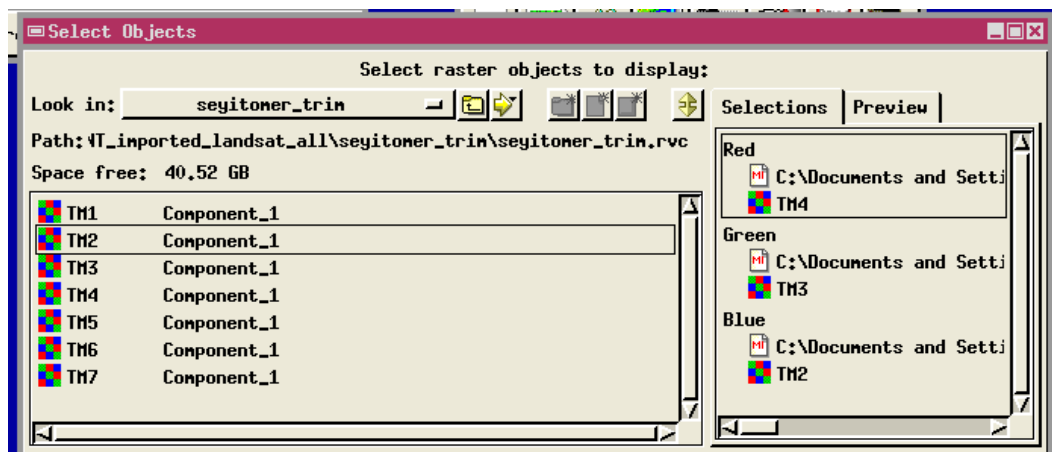


Photo Infrared Band (TM4) is sensitive to vegetated areas. In the image, areas representing with red colors can be considered as densely vegetated.

3-IMAGE ENHANCEMENT

Contrast Enhancement,

It is a type of **SPAECTRAL** enhancement. In this enhancement method, histogram of an image is manipulated.

Display> Spatial Data Display>New 2D Grup 

To add a raster layer press **Add Layer:**  in Group control window.

Select the raster object **"TM1"** by single click on the icon from folder **"seyitomer_trim"** .

This action opens blue band of a Landsat TM imaginary file.

Group Control window>Tools> Raster Histogram

Observe histogram by looking at its shape, mean value median, max, min etc.


Group Control window>Tools> Enhance Contrast

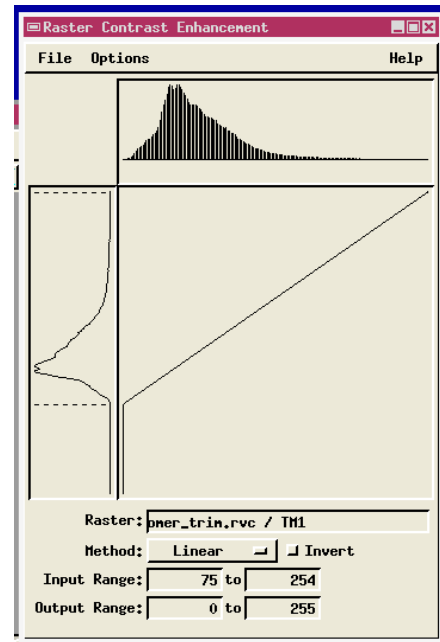
This action opens Raster Contrast Enhancement window.

It is called look-up table including input image histogram(left) and output image histogram.

Move dashed lines at the ends of the two end of the input.

Choose each method one by one and redraw to compare

the methods of contrast enhancement. **Redraw** 




Enhanced image can be saved by following procedure;

Group Control window>Tools> Enhance Contrast

Chose method> **Redraw**  > **File > Save All As > New > Write Name > Ok**

To view saved enhanced image;

Group Control window>Tools> Enhance Contrast

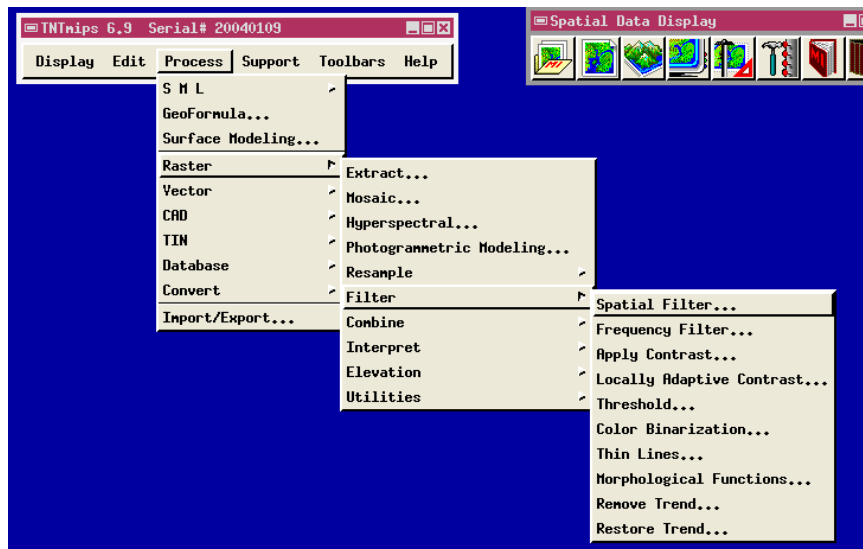
File >Open>Chose enhanced image from saved directory > **Redraw** 

SINGLE BAND ENHANCEMENT

SPATIAL ENHANCEMENT, (FILTERING)

In this enhancement technique, operation is carried out on DN values of pixels.

Process> Raster> Filter> Spatial Filter



About the Raster Spatial Filtering window

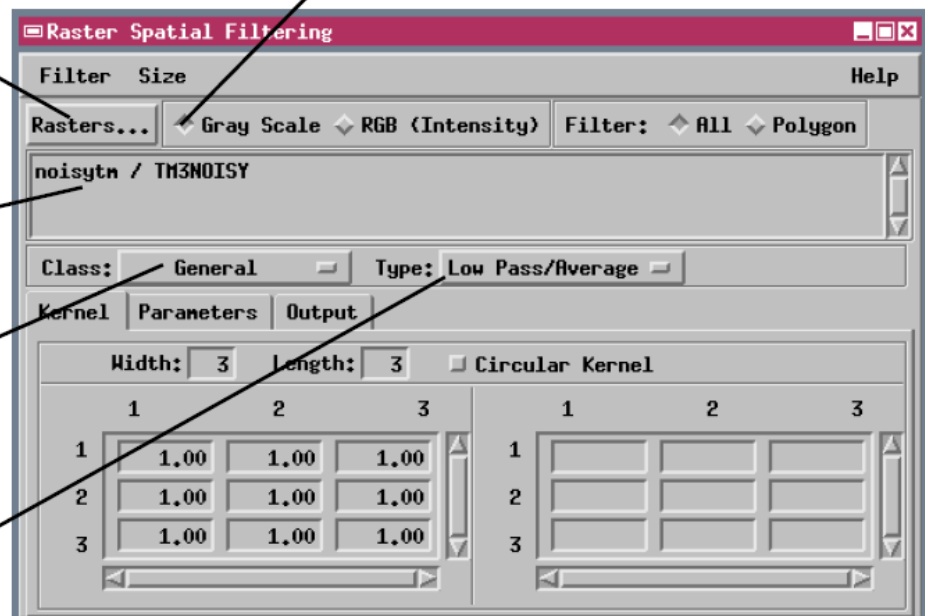
Press the Rasters button to select an input raster.

With the Gray Scale toggle button turned on, the filter can be applied individually to up to 50 grayscale rasters.

Input rasters are listed in the scrolled list.

Use the Class menu to choose the filter class.

Use the Type menu to choose the filter type.



The Kernel tabbed panel displays the array of weighting coefficients that make up the current filter kernel (for filters in the General class).

Filtering Procedure:

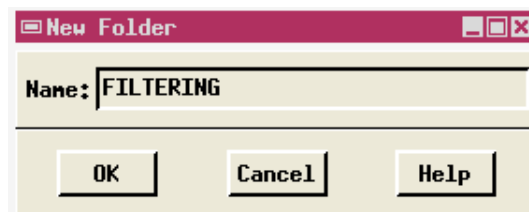
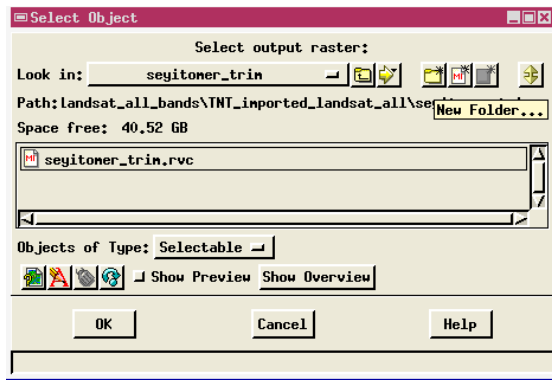
-Rasters> Chose **object** "TM1" from **file** "seyitomer_trim" in "Seyitomer_trim" **folder**.

-Class> General

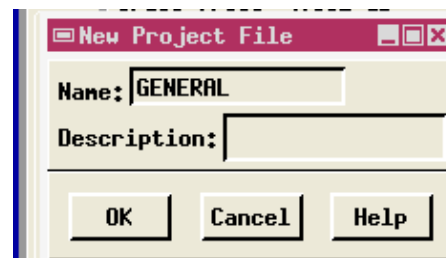
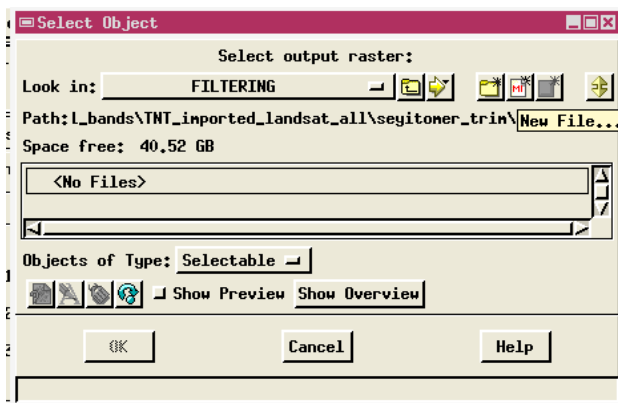
-Type> Low Pass/Average

-Kernel>width: 3, High: 3

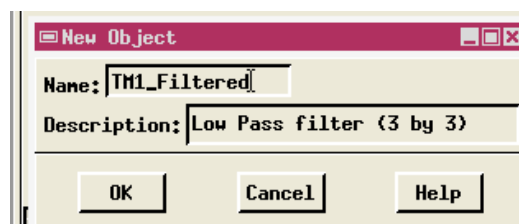
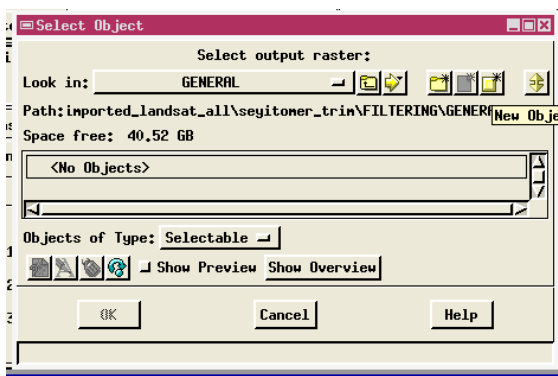
-Filter> Run>New Folder>write name of folder same as blow>OK



>New File>Write name of the file same as blow> OK



>New Object> you can accept the automatically given name> OK



-User defined linear feature (east x west) extraction filter. (Kernel size 5x5)

This filter results in an image in which linear features on the east- west direction are brighter.

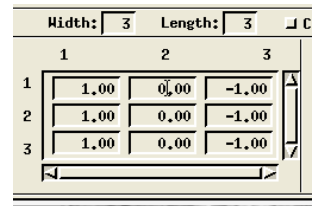
####By same procedure, create filtered objects below from TM1 and save to the file GENERAL in folder FILTERING;#####

1) Law Pass Kernel size 7x7

2) High Pass Kernel size 3x3


3) High Pass Kernel size 7x7

4) User defined linear feature north x south) extraction filter. (Kernel size 3x3)



| | 1 | 2 | 3 |
|---|------|------|-------|
| 1 | 1.00 | 0.00 | -1.00 |
| 2 | 1.00 | 0.00 | -1.00 |
| 3 | 1.00 | 0.00 | -1.00 |

Object name :north_south

Open these raster images with original TM1 together via Add Layer . And,

Compare them.

Which one is sharpened?

Which one is smoothed?

Compare linearity in north_south image and original "TM1" one.

5) By same procedure, create filtered objects below from TM1 and save to the file Noise Reduction in folder FILTERING;

Class: noise reduction

Type: median

Kernel size: 5x5

Folder: FILTERING

File: Noise Reduction

Object name: automatically given name can be used

6) By same procedure, create filtered objects below from TM1 and save to the file Edge Detection in folder FILTERING;

Class: Edge Detection

Type: Gradient-Sobel

Kernel size: 3x3

Folder: FILTERING

File: Edge Detection

Object name: automatically given name can be used

4-MULTI BAND OPERATIONS

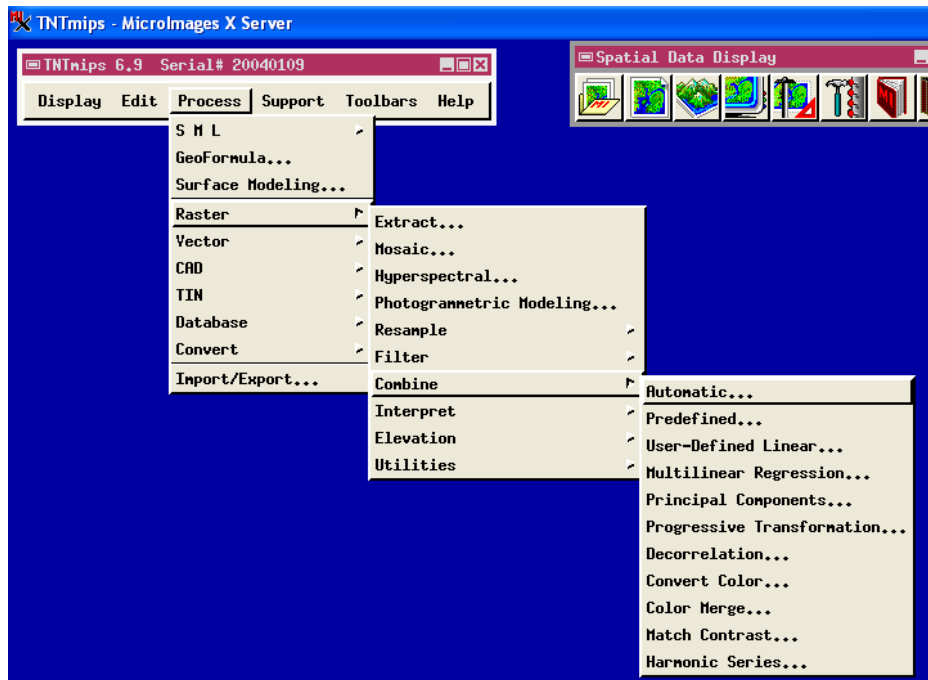
INDICES;

Normalized Difference Vegetation Index (NDVI)

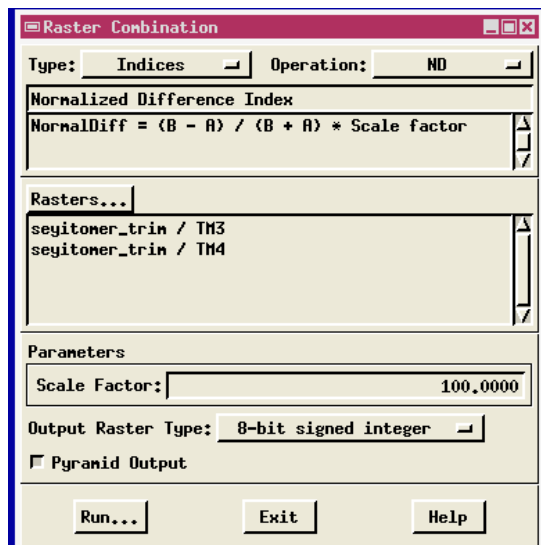
Indices are combinations of arithmetic operation between raster images.

NDVI NormalDiff = $(B - A) / (B + A) * \text{Scale factor}$,
Where A = Darker Band and B = Lighter Band

Process> Raster> Combine > Predefined



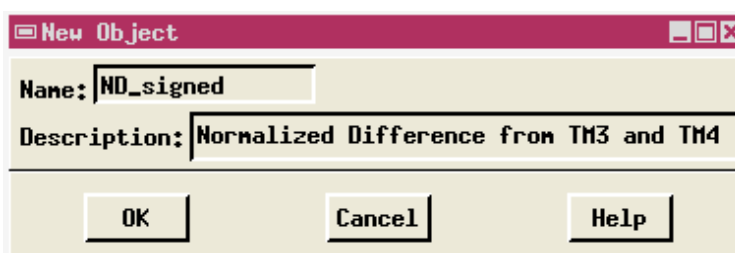
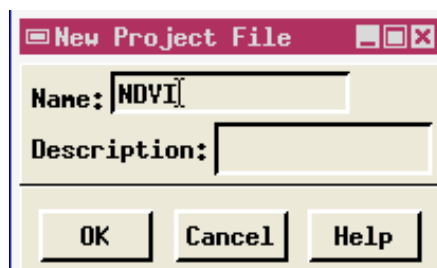
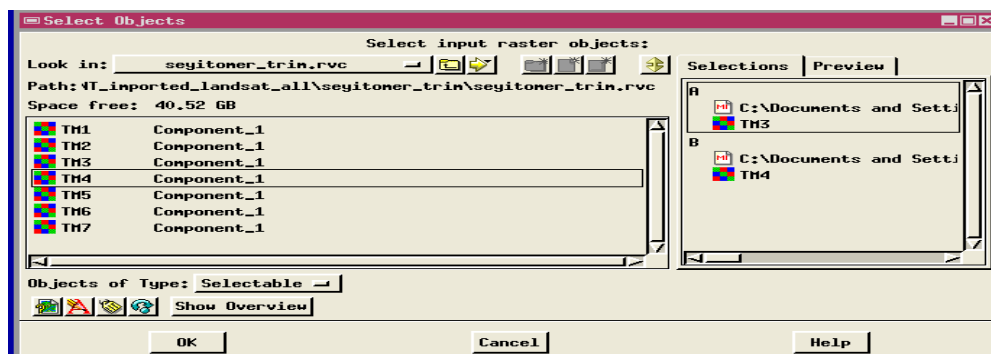
Type>Indices operation> ND



Select **Rasters** A and B from file Seyitomer_trim as A=TM3 and B=TM4

Output File Name: NDVI

Output object name: ND_signed

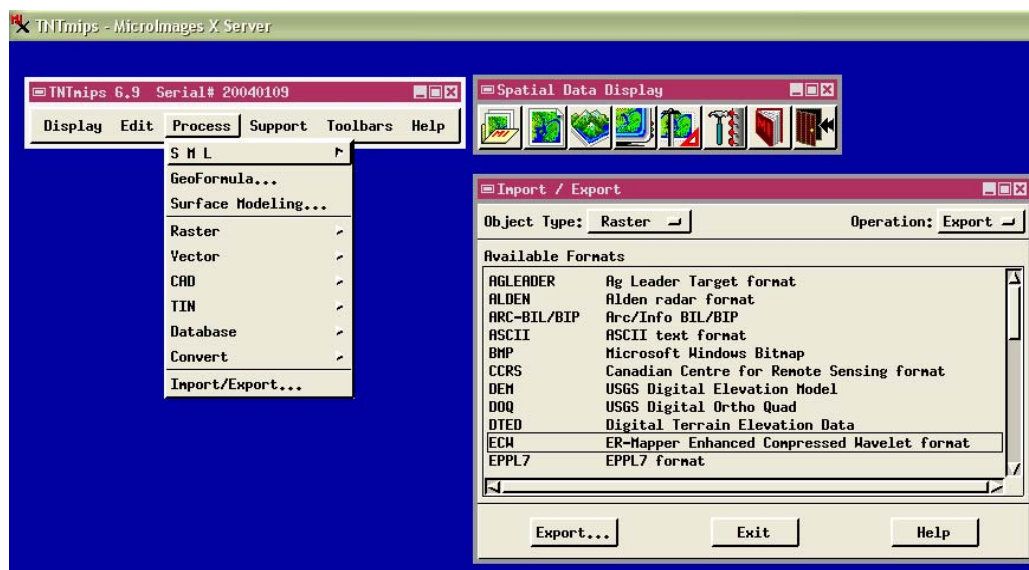


Display created raster 'ND_signed' and original image together and try to distinguish healthy and productive vegetation areas. Do same by choosing unsigned and save output to the NDVI file in NDVI folder.

5-IMPORT /EXPORT VECTOR and RASTER DATA

You can convert data various data formats to others using import export tool in TNTmips.

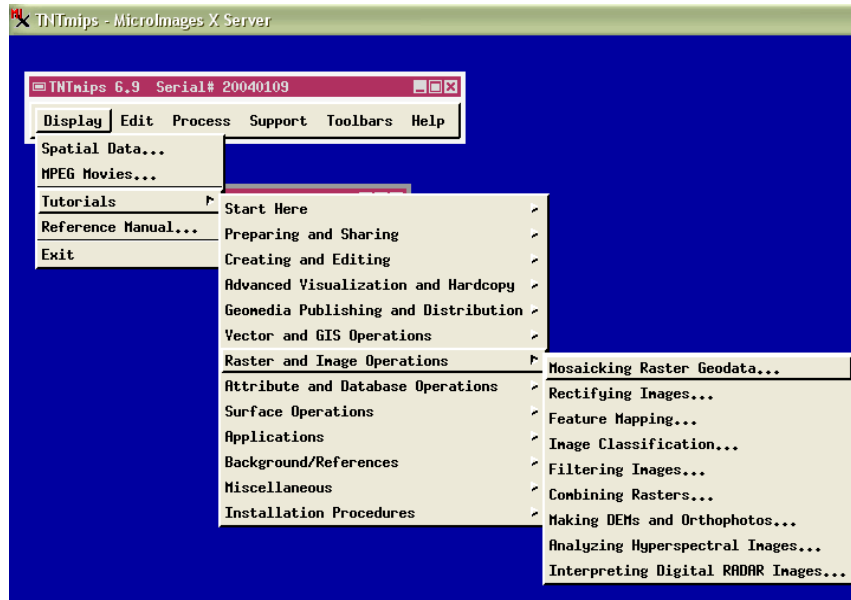
>Process> Import Export



6. RESOURCES OTHER THAN LAB MANUALS: TUTORIALS AND REFERENCE MANUAL

>Display> Tutorials or Reference Manual

If you will have trouble while working with TNTmips, you can check out tutorials and reference manual which are very simple and beneficial .pdf files.



>Check online resources

<http://www.microimages.com/documentation/index.htm>