

RS II HW4

PREPARED BY

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COURSE NAME : REMOTE SENSING II

LECTURER : PROF. DR. ESRA ERTEN

| <i>Data Set Attribute</i> | <i>Attribute Value</i> | <i>Data Set Attribute</i> | <i>Attribute Value</i> |
|-----------------------------|--|---------------------------------|------------------------|
| Satellite ID | Landast 5 | Image acquisition date and time | 2007/06/06 |
| Sensor ID | TM | Image Path number | 180 |
| Image Scene ID | LT51800312005157MTI00 | Image Row number | 031 |
| Image Product ID | LT05_L1TP_180031_20050606_20200902_02_T1 | Image quality | 9 |
| Sun elevation | 63.29149694 | Sun azimuth | 128.65785632 |
| Land Cloud Cover | 1.00 | Scene Cloud Cover | 1.00 |
| Corner Upper Left Latitude | 42.70394 | Corner Upper Left Longitude | 28.24930 |
| Corner Upper Right Latitude | 42.38177 | Corner Upper Right Longitude | 30.45888 |
| Corner Lower Left Latitude | 41.12716 | Corner Lower Left Longitude | 27.75566 |
| Corner Lower Right Latitude | 40.81262 | Corner Lower Right Longitude | 29.91411 |
| Corner Upper Left Lat DMS | 42°42'14.18"N | Corner Upper Left Long DMS | 28°14'57.48"E |
| Corner Upper Right Lat DMS | 42°22'54.37"N | Corner Upper Right Long DMS | 30°27'31.97"E |
| Corner Lower Left Lat DMS | 41°07'37.78"N | Corner Lower Left Long DMS | 27°45'20.38"E |
| Corner Lower Right Lat DMS | 40°48'45.43"N | Corner Lower Right Long DMS | 29°54'50.80"E |

Table 1 Metadata table from of image from Landsat 5 TM Level 1 satellite

Table 1 is containing the metadata of my workspace area image at "<https://earthexplorer.usgs.gov>".

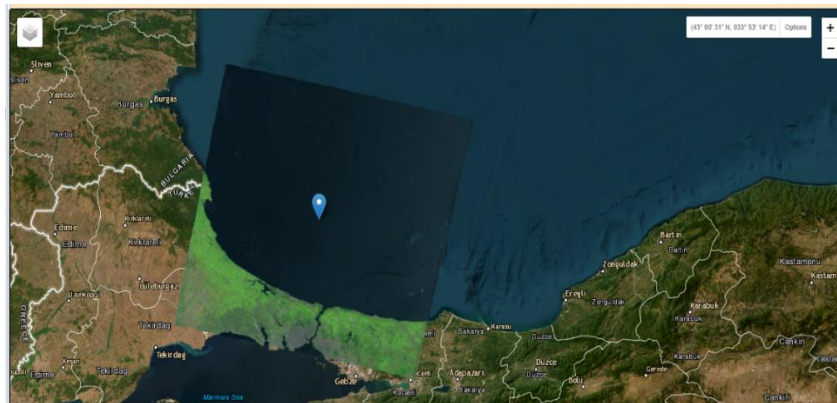


Image 1 Image of Landsat 5 TM Level 1 satellite with 180 Path and 31 Row numbers dated May 11, 2007.

Figure 1 is the preview image of my workspace on "<https://earthexplorer.usgs.gov>".

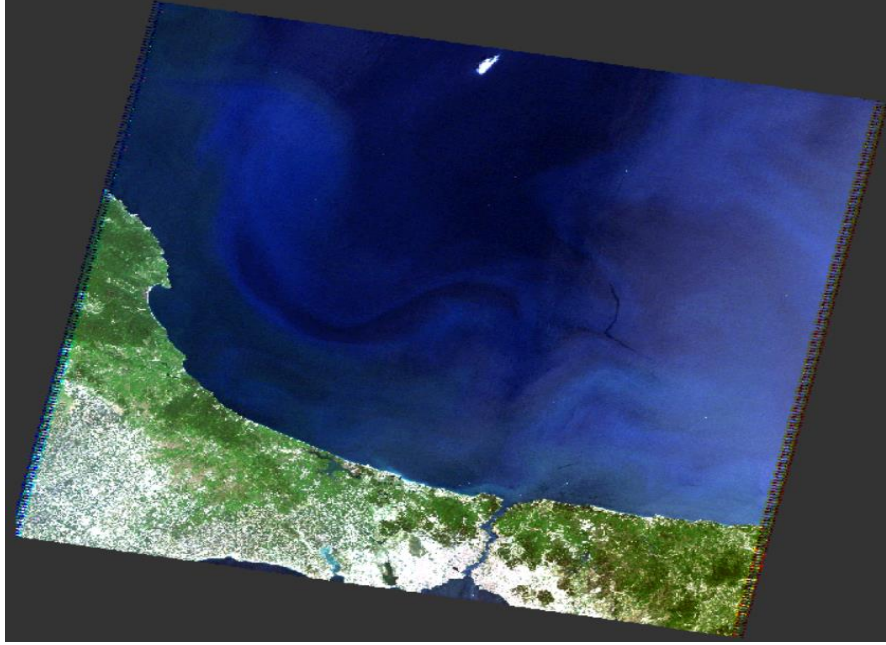


Image 2 Image that opened with SNAP program.

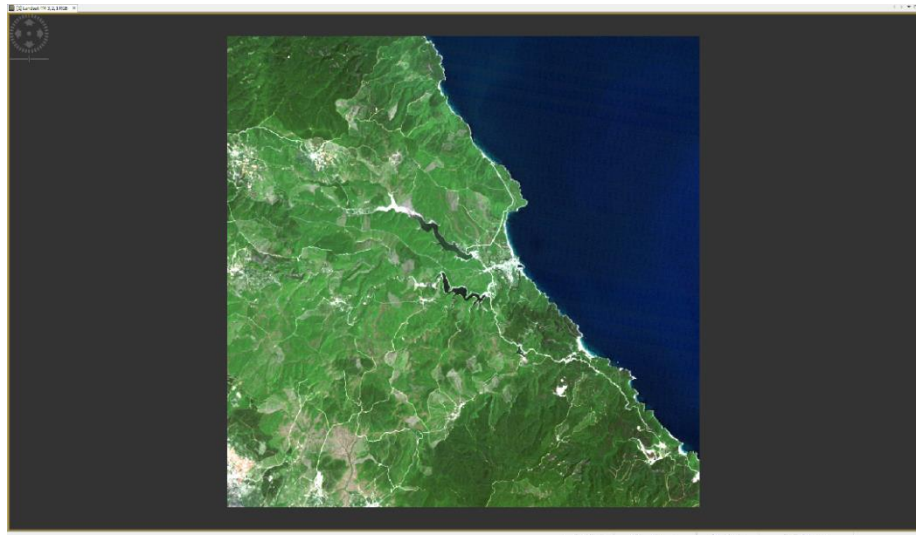


Image 3 Subset Image

CHANGE DETECTION

Comparing remote sensing photos captured at various dates allows for the identification of alterations in land characteristics, which is known as change detection. Both manual labor and software for distant sensing can be used for this. An observer chooses regions of interest and compares them between photographs from two different dates in manual interpretation. Two Landsat 5 TM pictures, one from May 11, 2005, and the other from August 12, 1994, were used in this project. The same region appeared in both pictures as subsets. Several change detection techniques, including band subtraction, band ratio, NDVI difference image, NDBI difference image, and post-classification difference, were going to be used in the SNAP application. These strategies' outcomes were contrasted and assessed. In the final step, comments and evaluations would be given.

PREPROCESSING

The Date 2 image, a new image for the change detection challenge, was downloaded from the EarthExplorer website. For good viewing of the image, the cloud cover criterion was carefully set to 0.00 while choosing new data. Image 4 displays a current picture that was downloaded from the EarthExplorer website. At 5, the freshly opened RGB image created by SNAP program is shown.

Using the pin manager tool, geocoordinates were found for a subset of the 1000 *1000 pixel image that was utilized in earlier homework. Pins are positioned in the top left and bottom right corners to help ascertain this. These pins are then saved and opened with the just downloaded image. The subset tool was launched in order to subset a new image, and storing coordinates were inserted. Image 6 displays the new subsetting image that was obtained, which measures 1000 * 1000 pixels in RGB format.

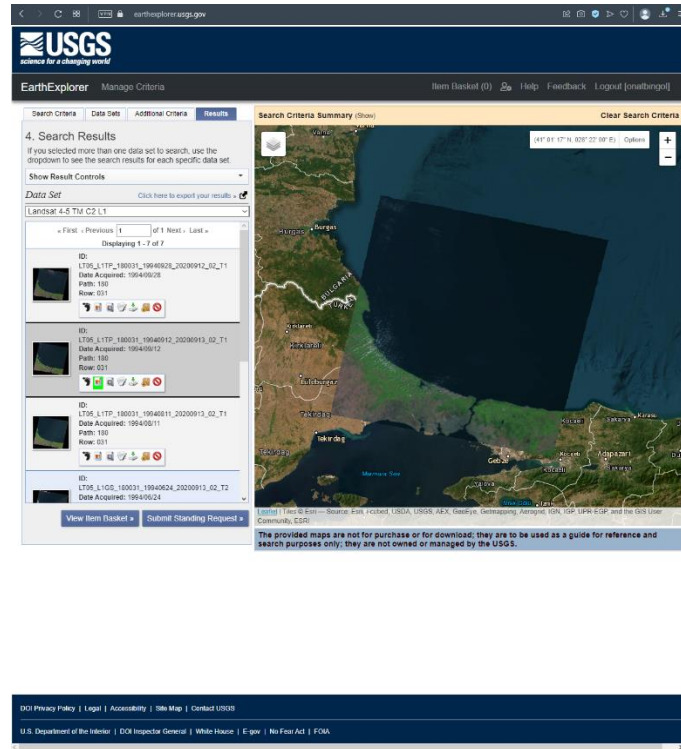


Image 4 Image of Landsat 5 TM Level 1 satellite with 180 Path and 31 Raw numbers dated August 12, 1994.

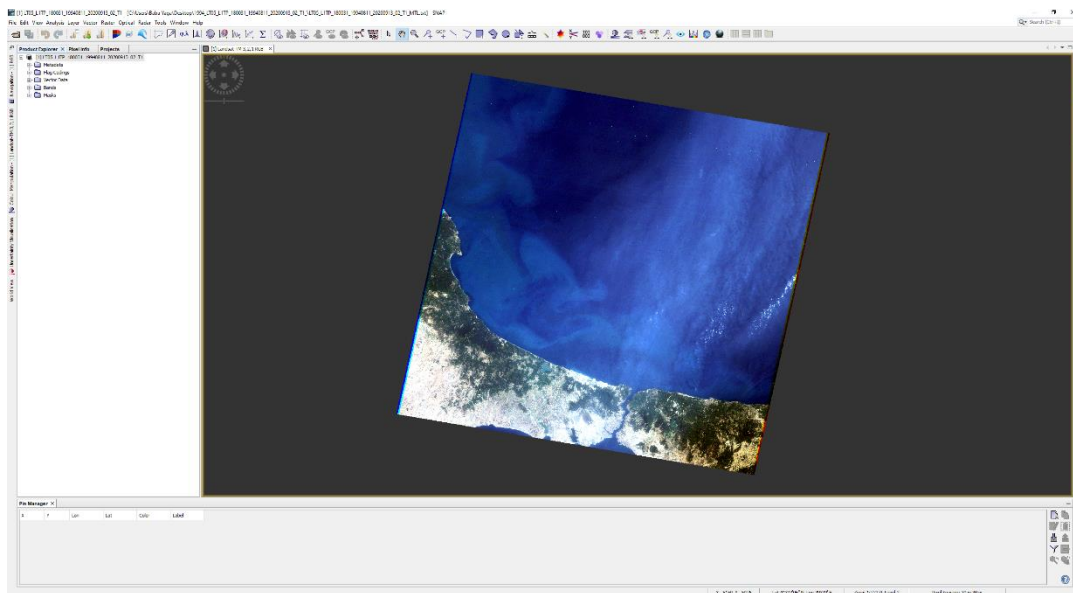


Image 5 New Image that opened with SNAP program.

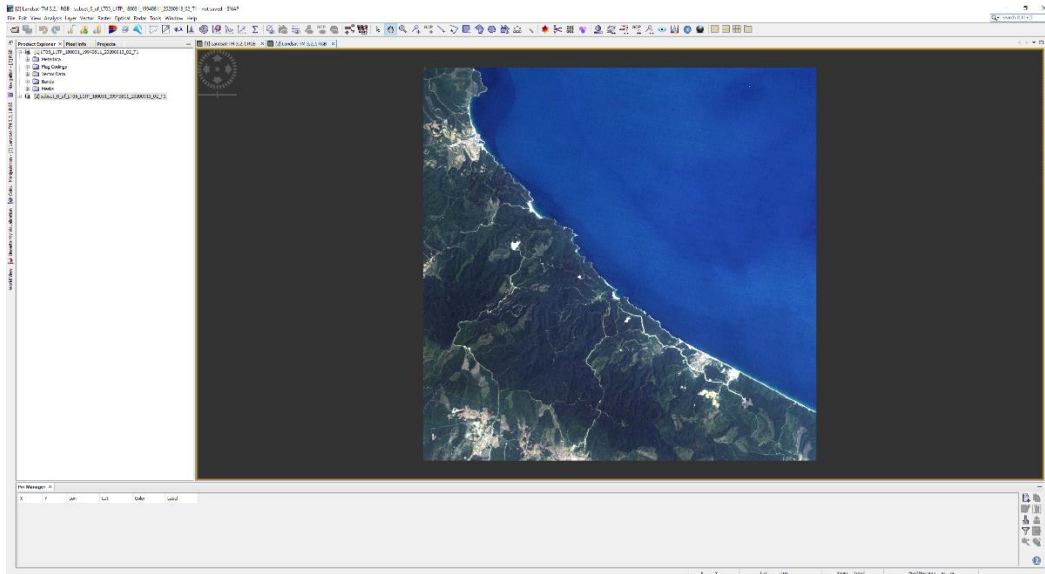


Image 6 New Subset Image

CHANGE DETECTION

Using the Create Stack Module: Stacking is the process of combining several photos into one image. Images from the Date 1, 11.05.2005, and Date 2, 12.08.1994 subsets are accessible. The "Create Stack" module was used to aggregate these two data sets into a single file.

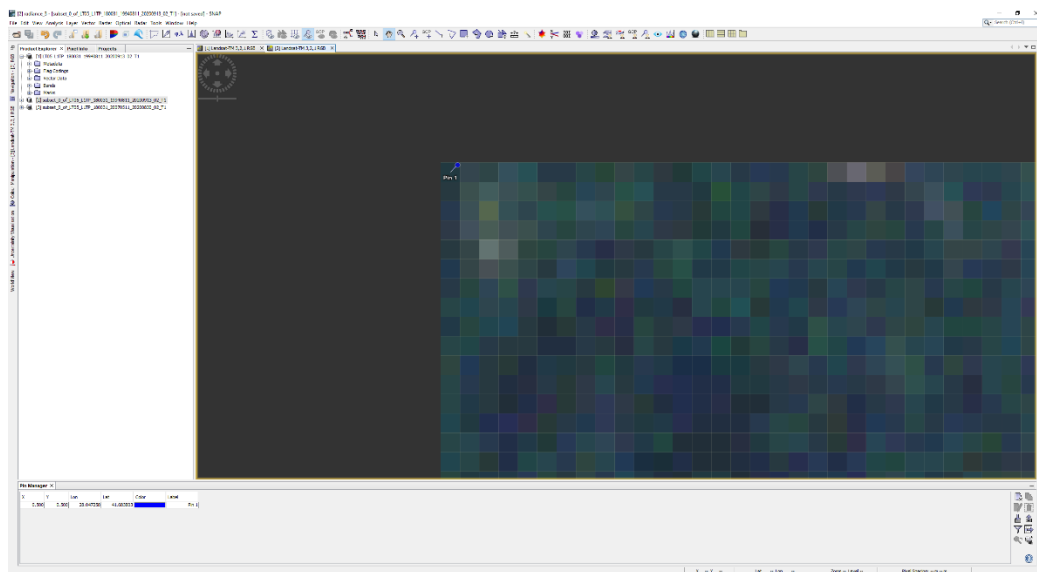


Image 7 Pin Placed at the Top Left Corner of the Image.

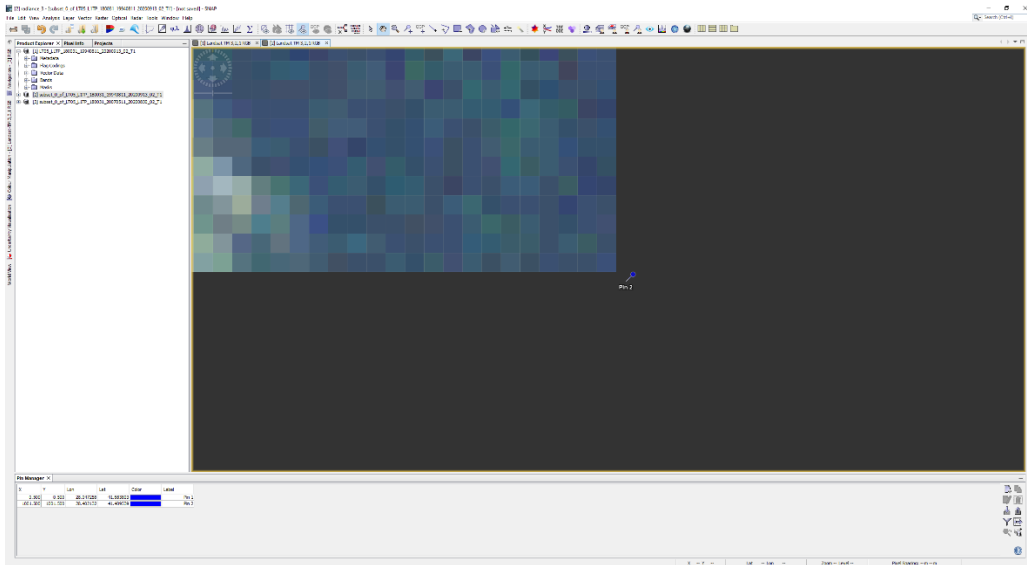


Image 8 Pin Placed at the Bottom Right Corner of the Image.

| Pin Manager X | | | | | |
|---------------|----------|-----------|-----------|-------|--------------|
| X | Y | Lon | Lat | Color | Label |
| 0.500 | 0.500 | 28.047258 | 41.683803 | | Left Top |
| 1001.500 | 1001.500 | 28.402132 | 41.409539 | | Right Bottom |

Image 9 Coordinates of 2 Pins.

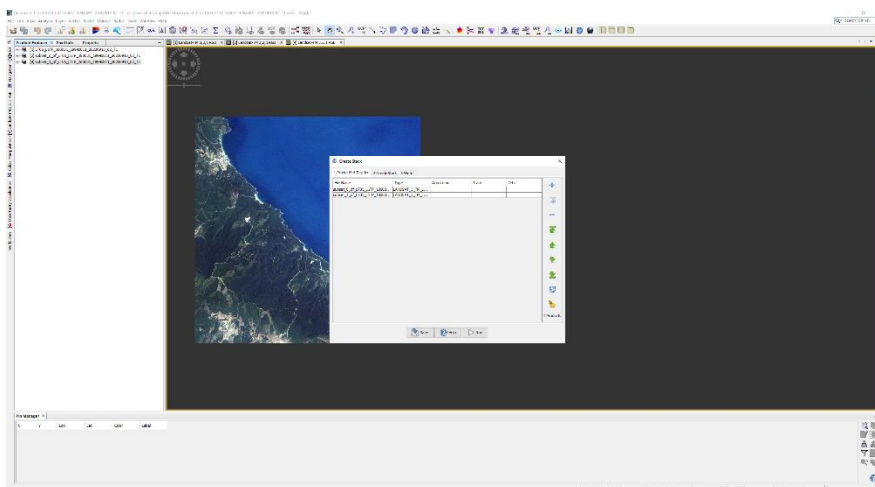


Image 10 Stack Create Tool opened and Added Subsets.

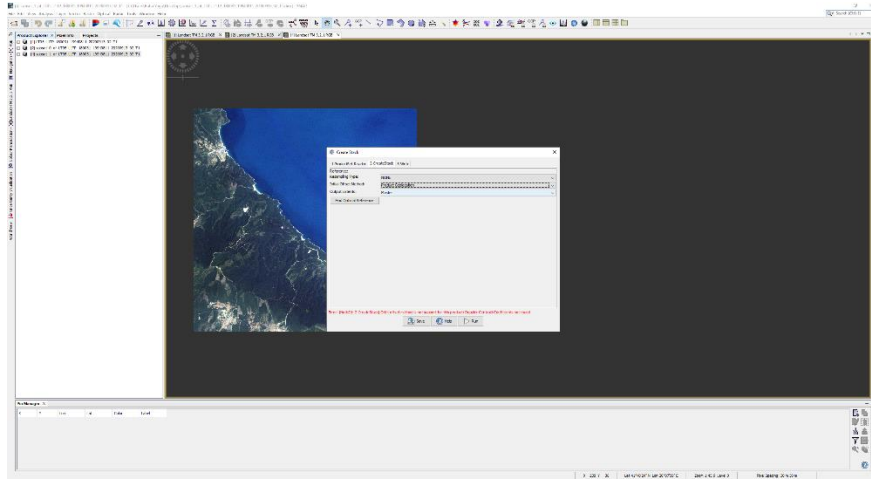


Image 11 Initial Offset Method: Product Geolocation Setting

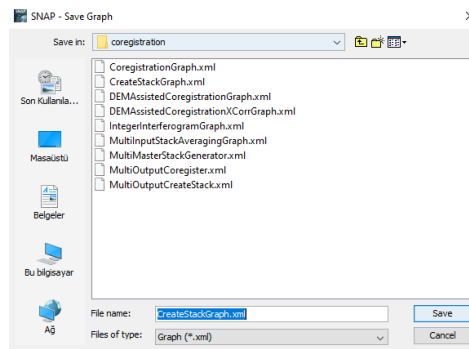


Image 12 Stack Saved

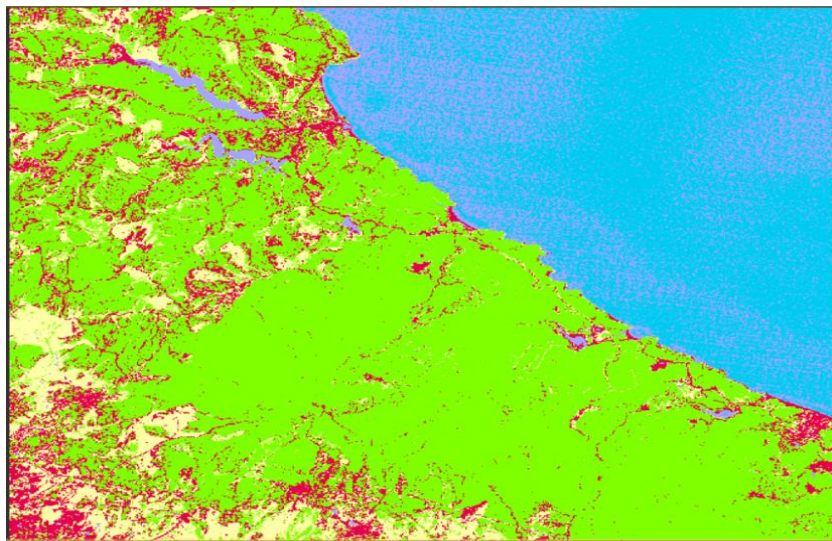


Image 13 Supervised Image

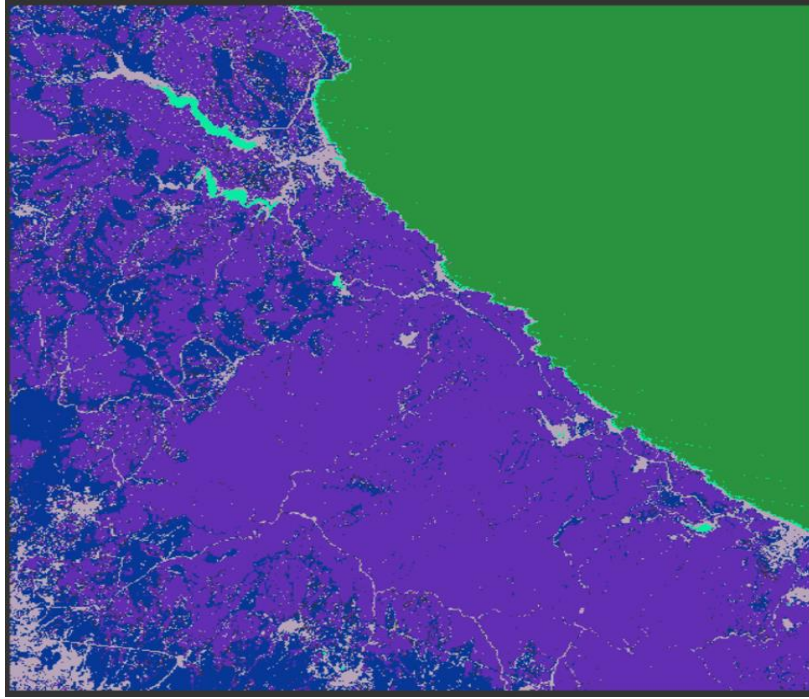


Image 14 Unsupervised Image

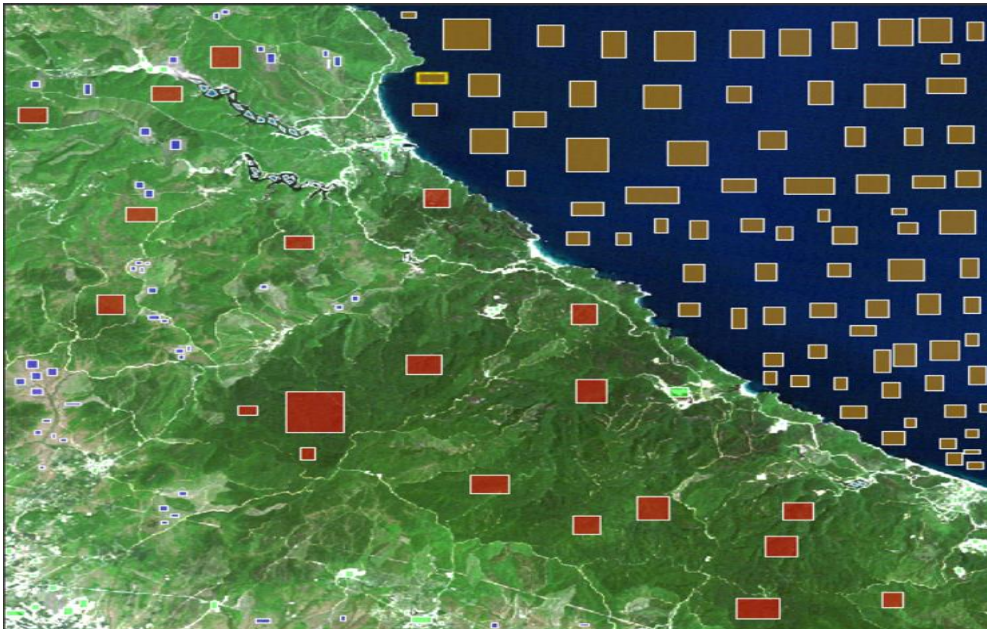


Image 15 Classification Step.

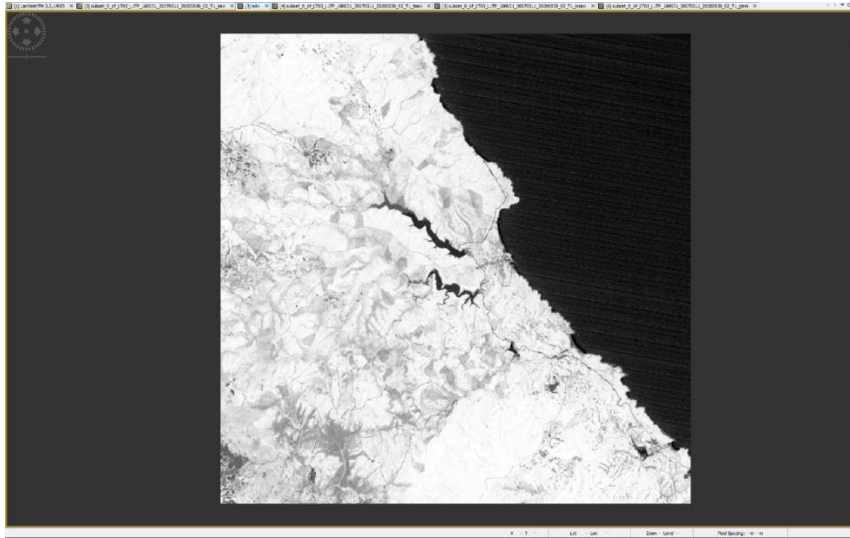


Image 16 Normalized Difference Vegetation Index Image.

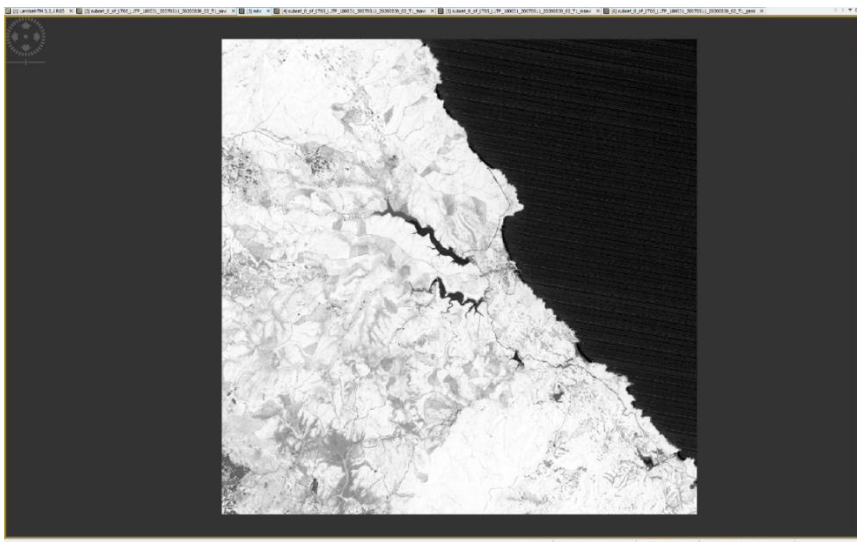


Image 17 Soil Adjusted Vegetation Index Image.

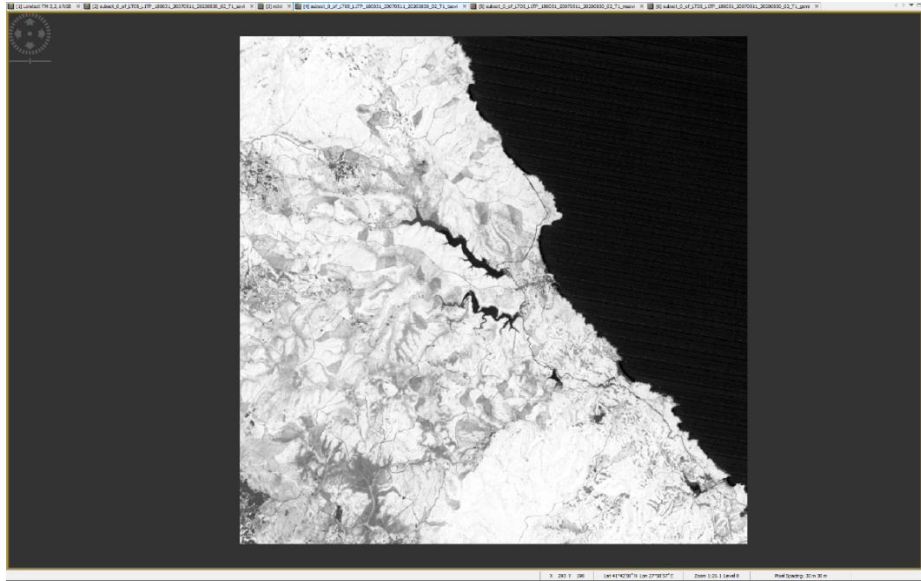


Image 18 Transformed Soil Adjusted Vegetation Index Image.

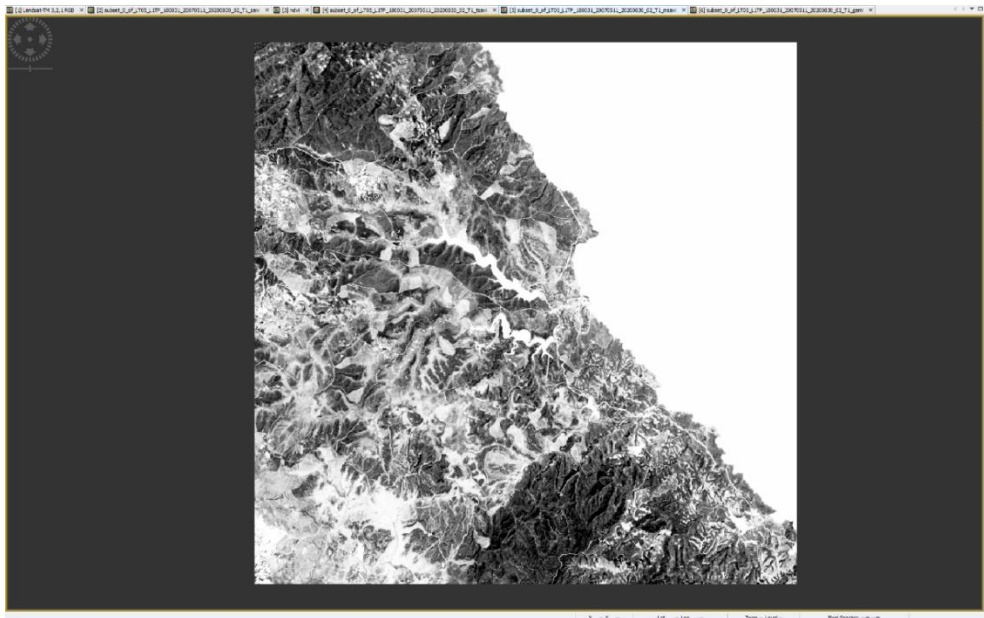


Image 19 Modified Soil Adjusted Vegetation Index Image.

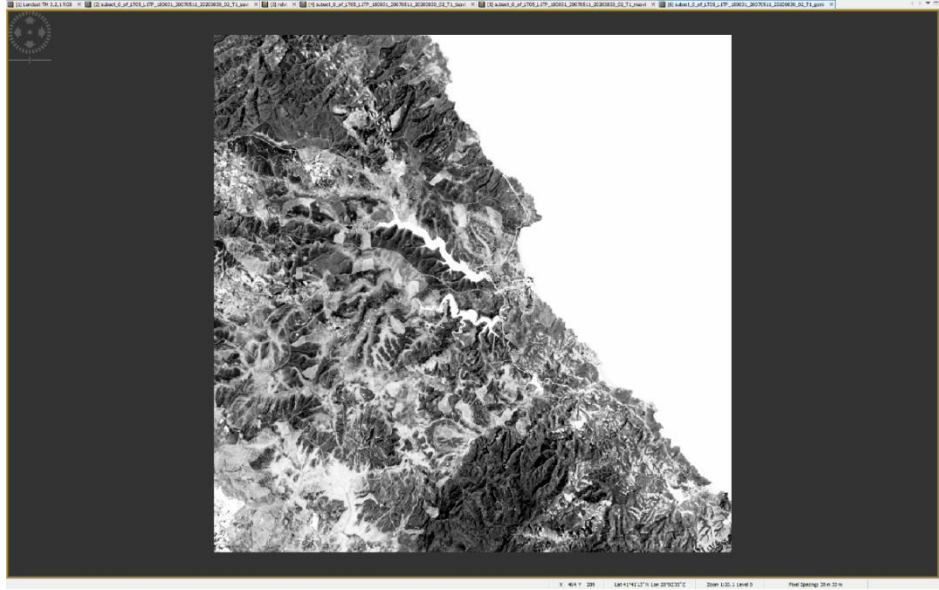


Image 20 Global Environmental Monitoring Index Image.