INDIAN INSTITUTE OF REMOTE SENSING
Indian Space Research Organisation
Department of Space, Govt. of India

(PRACTICAL REPORT)

P9: RS image analysis for coastal feature mapping related to inundation and erosion

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AIM :

- To identify coastal erosion and inundated areas.

SOFTWARE USED

1. SNAP

2. ARC GIS

STUDY AREA

- Bangladesh Coastal region

PROCEDURE:

1. SAR erosion identification using SNAP.

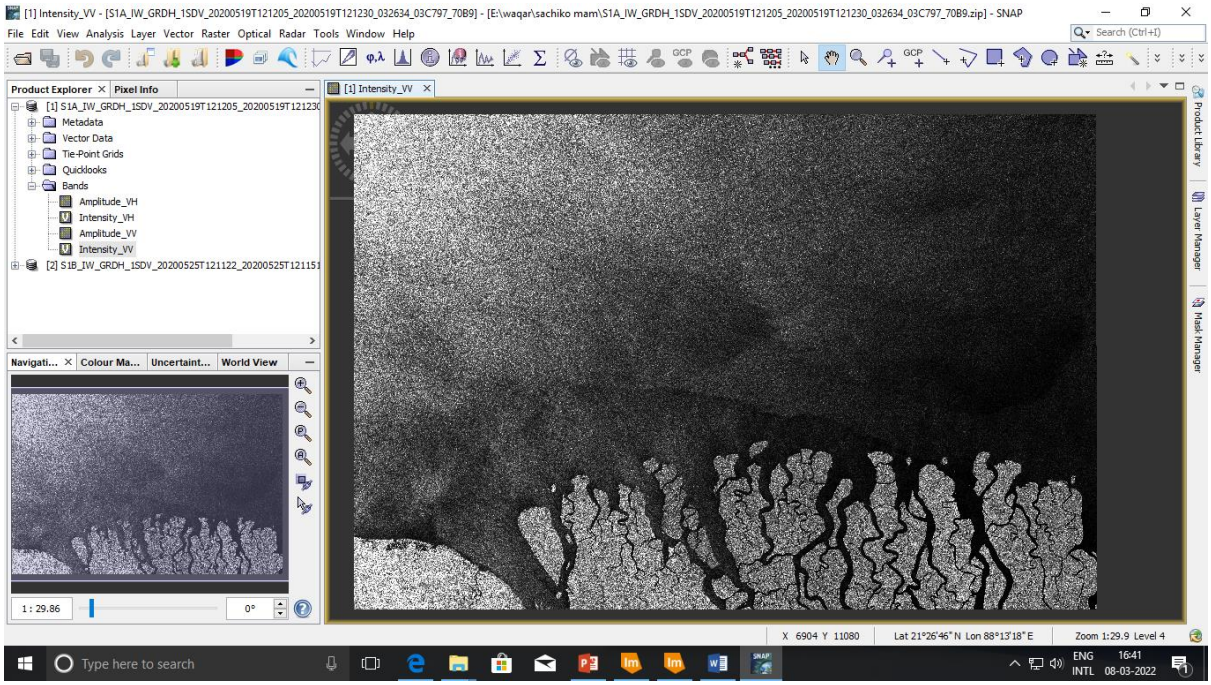
Data Used: Sentinel 1A & Sentinel 1B

Step 1: Open SNAP software

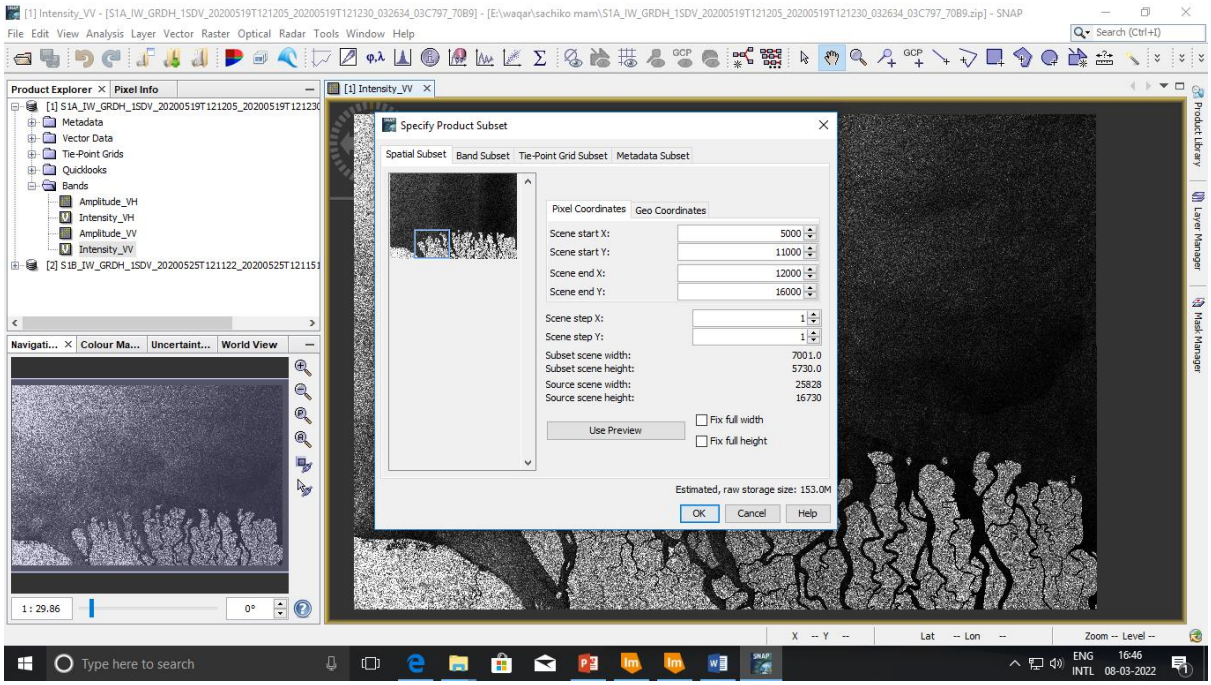
Step 2: Open

S1A_IW_GRDH_1SDV_20200519T121205_20200519T121230_032634_03C797_70B9 &

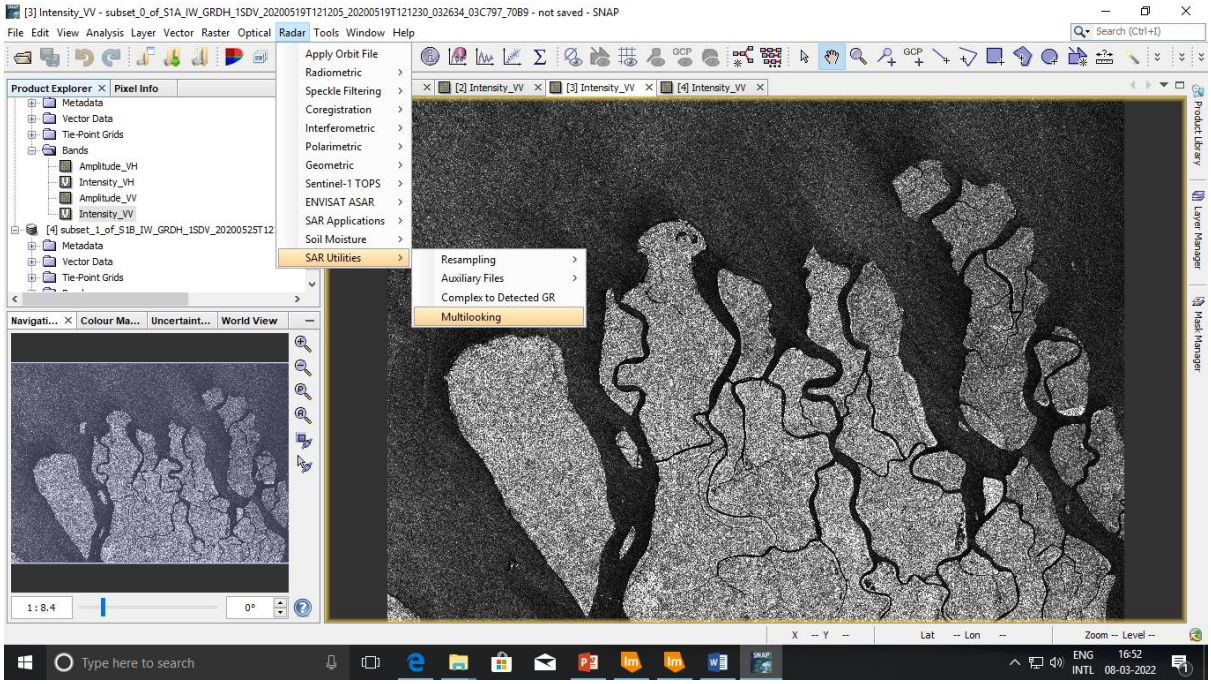
S1B_IW_GRDH_1SDV_20200525T121122_20200525T121151_021738_029423_7B23



Step 3: Subset the data into a given size. The below images show the subset area of images.

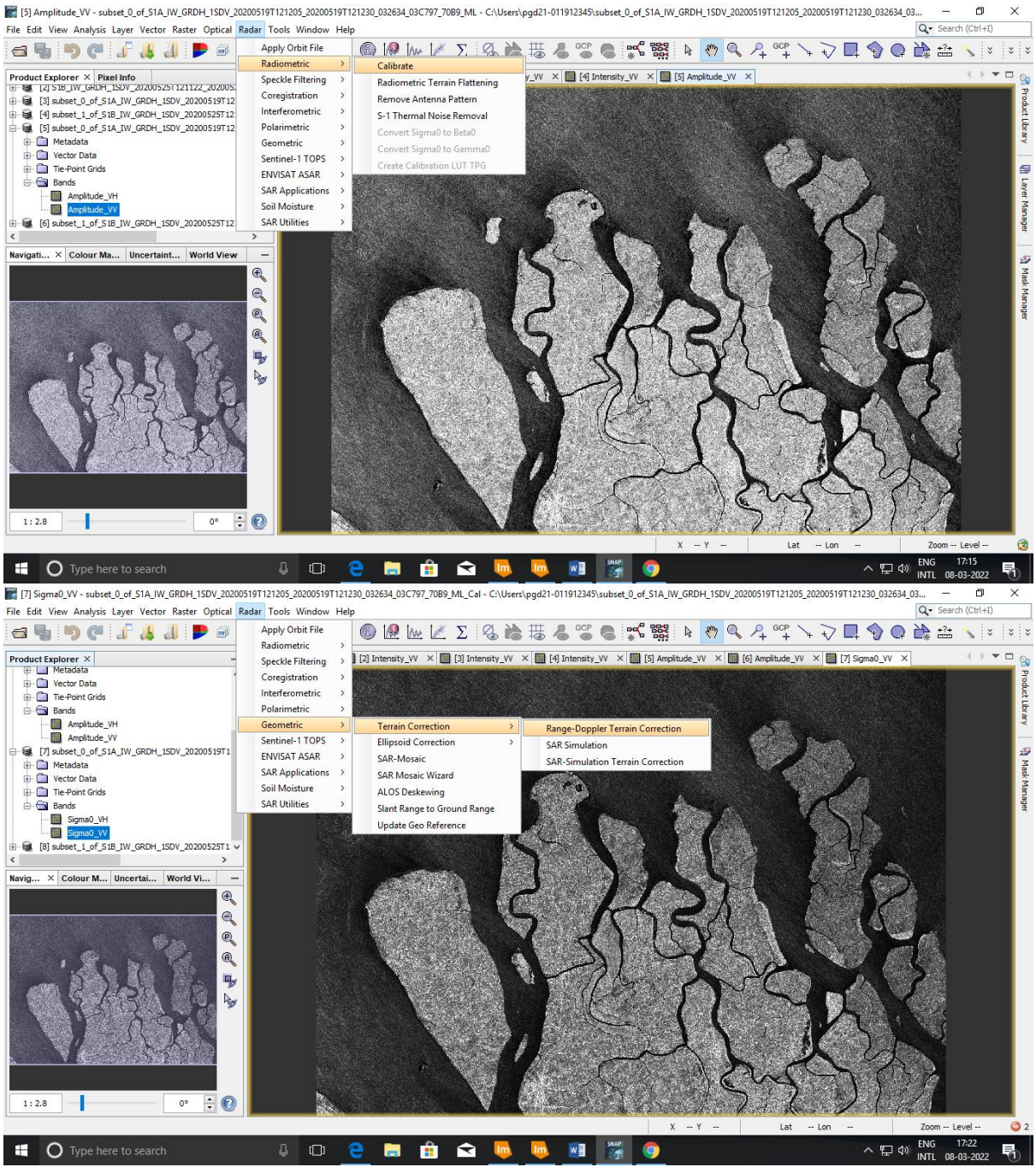


Step 4 : we reduce the speckle in the Image by following the steps, Radar: SAR utilities: Multilooking: Number of Range Looks – 3 .

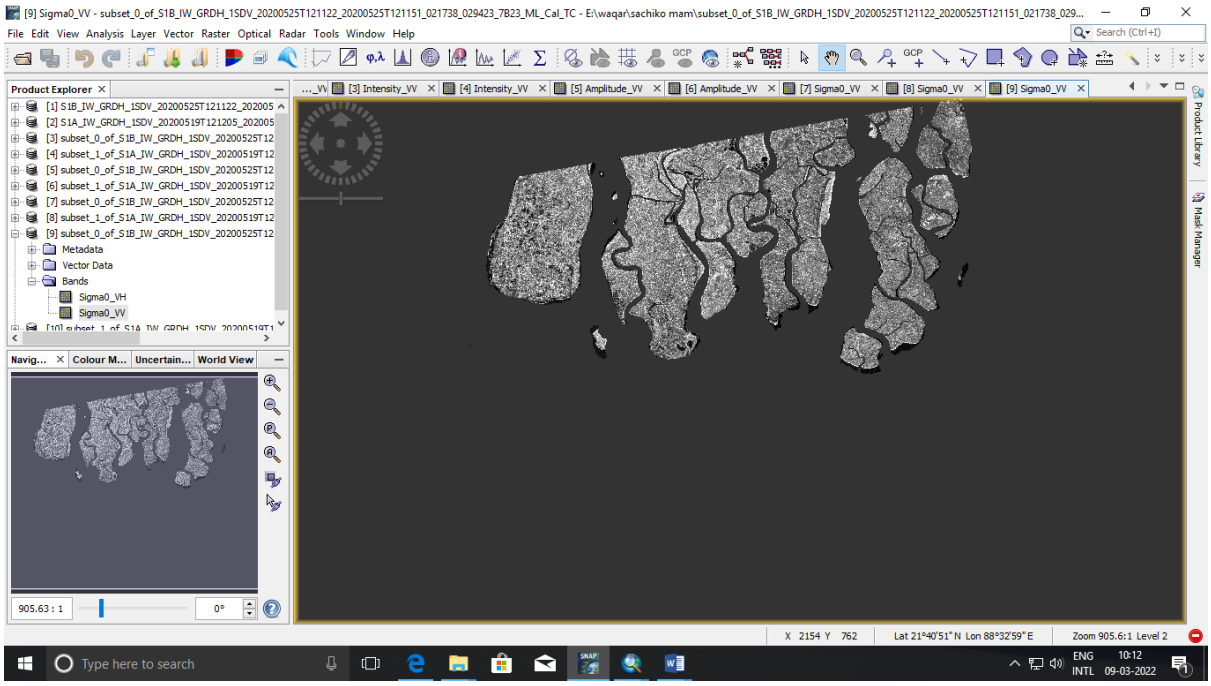


Step 4: we perform radiometric correction through following steps, Radar: Radiometric: Calibrate (convert to dB)

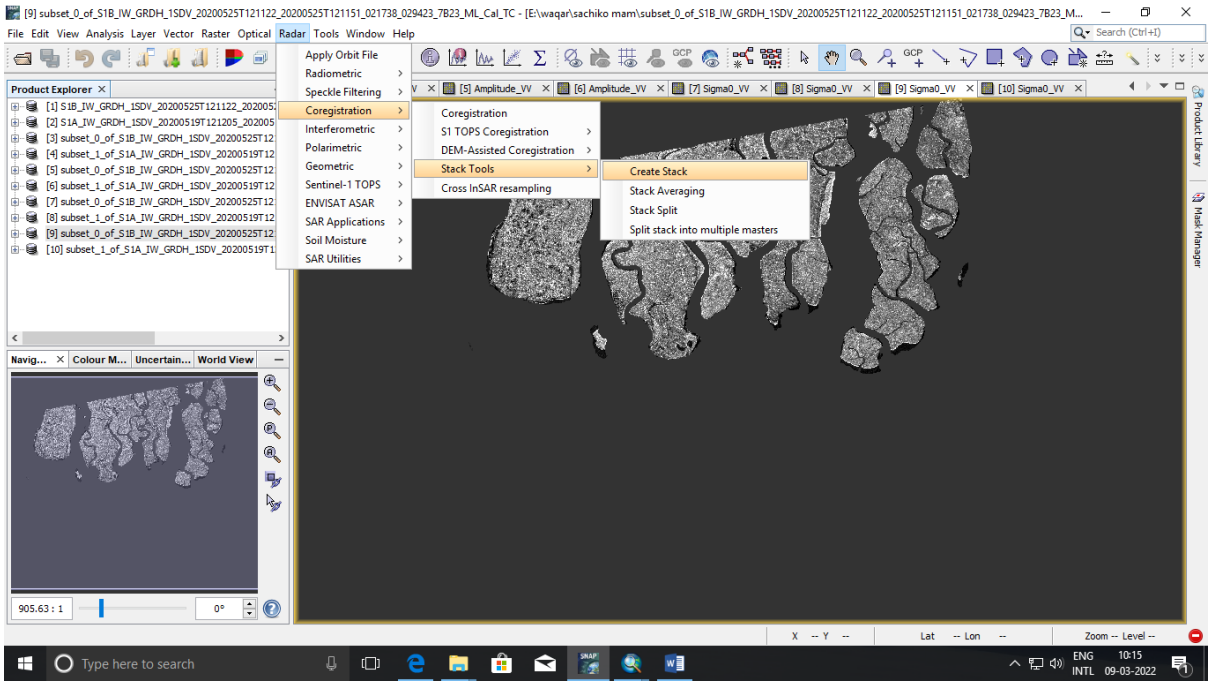
Step 5: then we perform range Doppler Terrain correction by following the steps, Radar: Geometric: Terrain correction: Range Doppler Terrain correction (convert to dB)

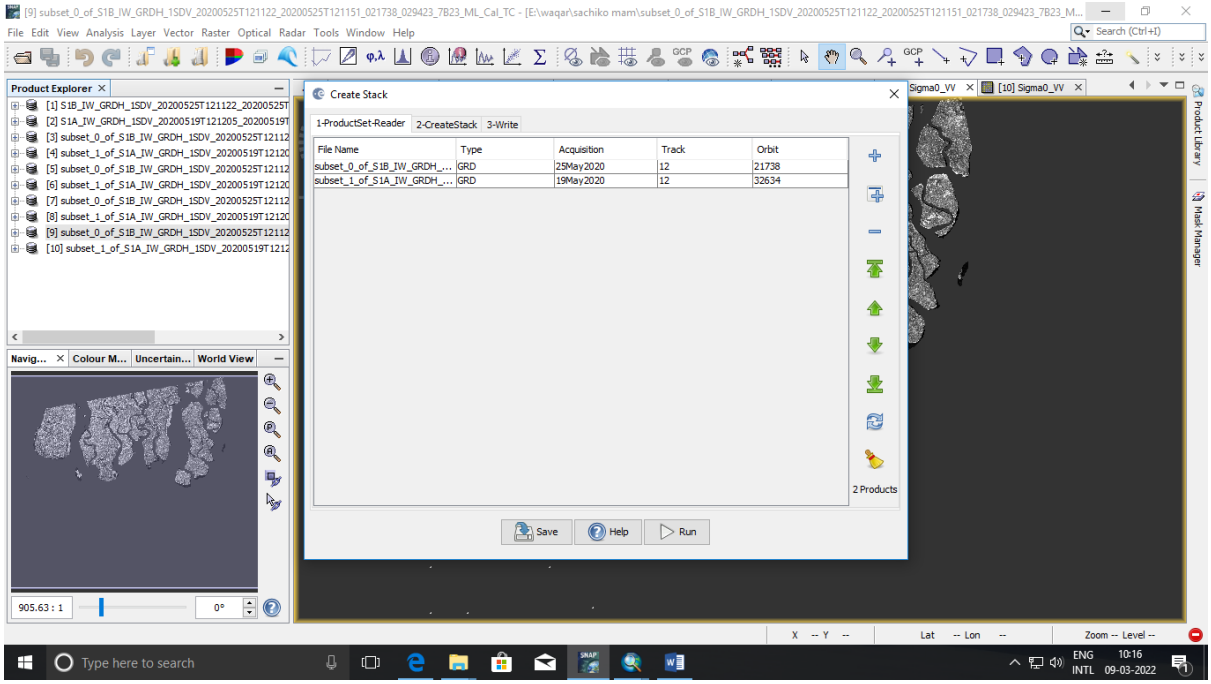


Radiometric and geometrically corrected image sample, similarly both the Sentinal 1A and Sentinal 1B are preprocessed.

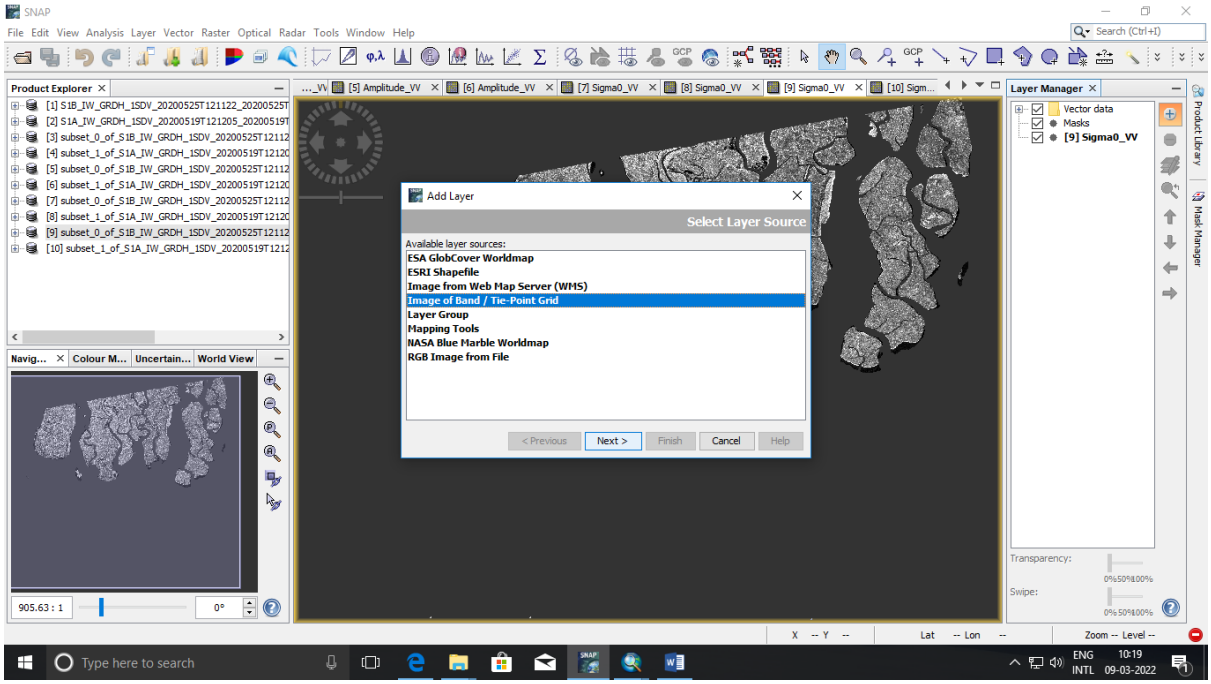


Step 5: we coregister both the image :Coregistration: Stack Tools: Create Stack (Product Geolocation)

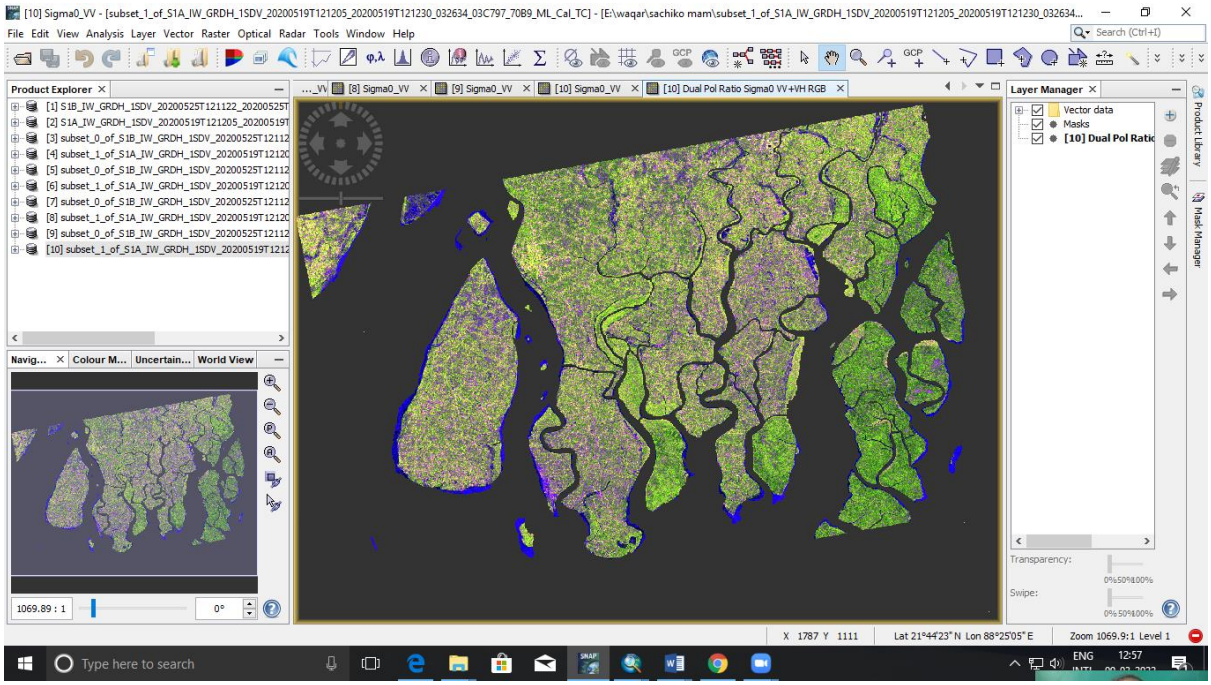




Step 6: Click Image of Band/Tie-point Grid



Step 7 : Window: Open RGB Image Window, give colour.



Inference : blue region in the image shows the eroded area.

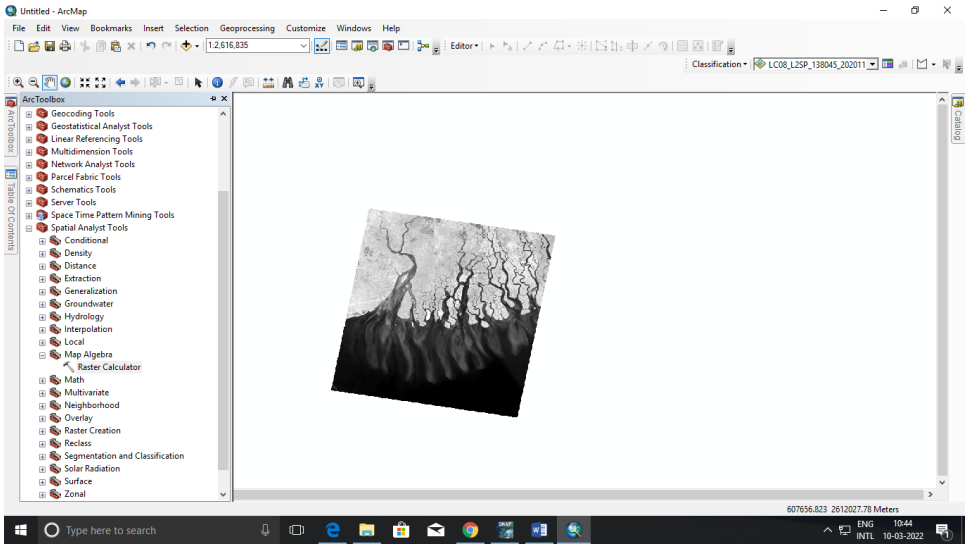
2nd process:

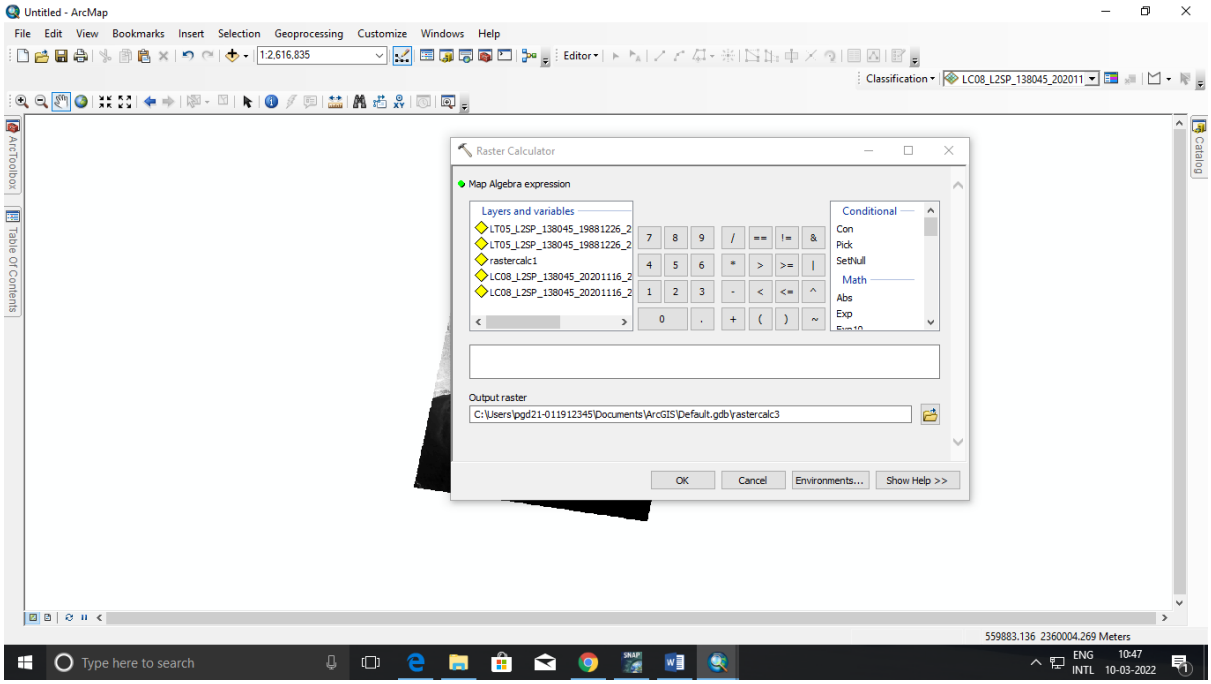
In the second practicle we download the Landsat 5 and Landsat 8, 30 m resolution data from usgs earthexplorer.

Aim : to find inundated region from NDVI and NDWI

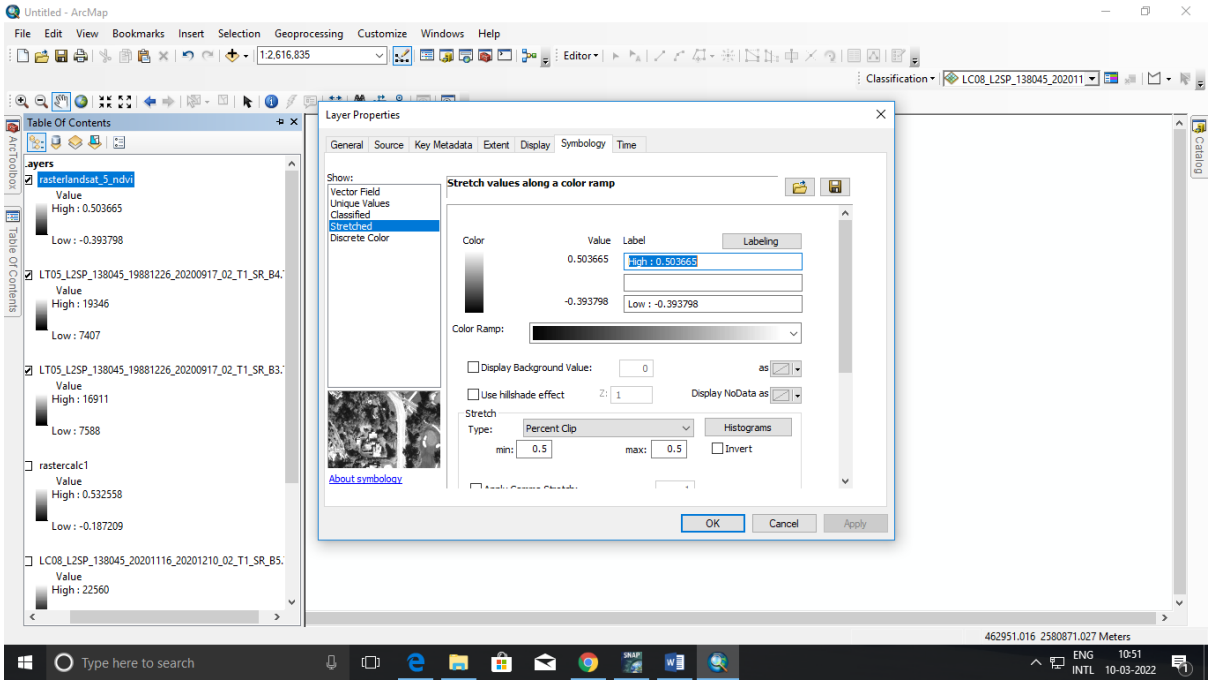
Data provided: LT05_L2SP_138045_19881226_20200917_02_T1; LC08_L2SP_138045_20201116_20201210_02_T1

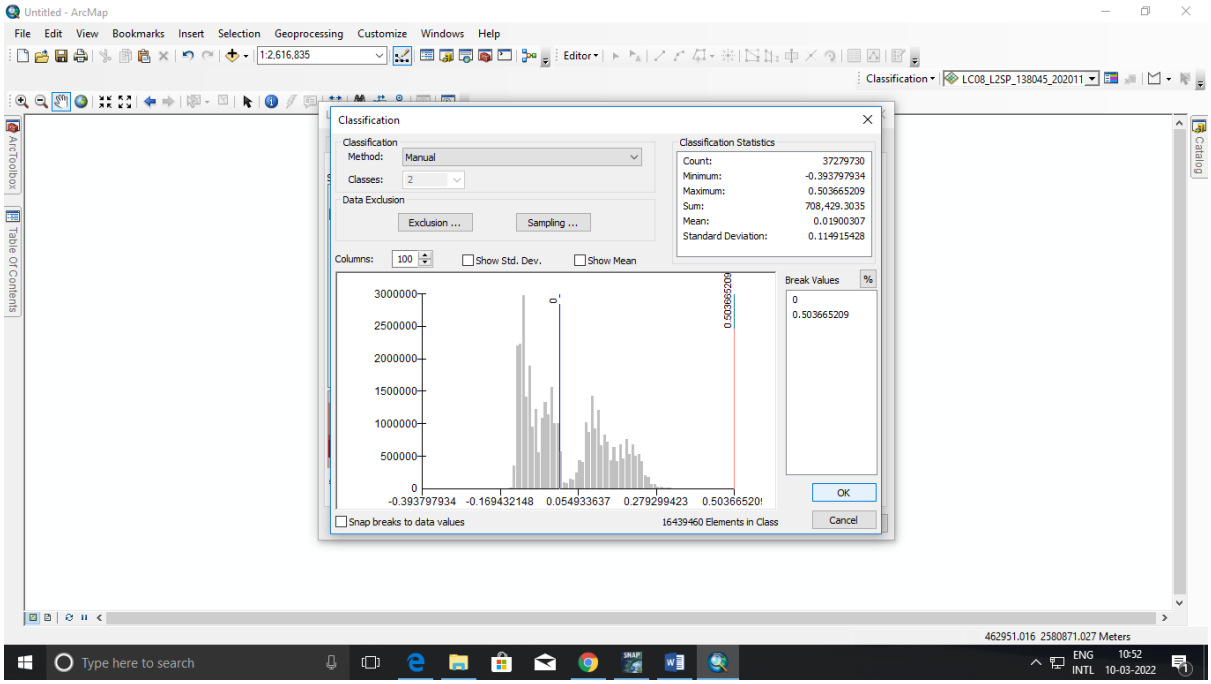
Step 1 : we go to raster calculator and calculate NDVI and NDWI.





Step 2 : we classify the NDVI and NDWI

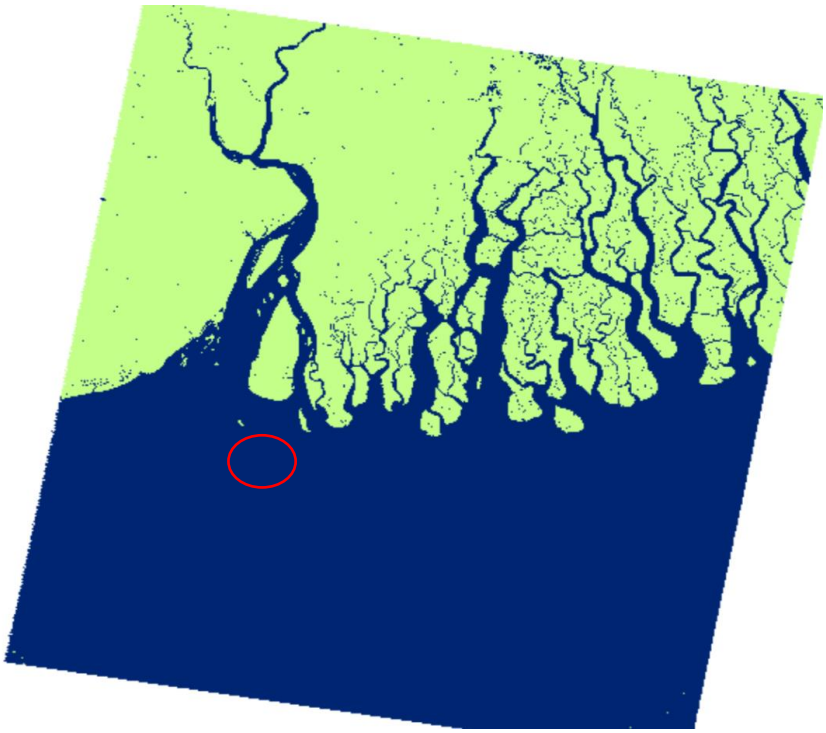



Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Classification
Method: Manual
Classes: 2
Data Exclusion
Exclusion ...
Sampling ...
Columns: 100
Show Std. Dev.
Show Mean
Classification Statistics
Count: 37279730
Minimum: -0.393797934
Maximum: 0.503665209
Sum: 708,429.3035
Mean: 0.01900307
Standard Deviation: 0.114915428
Break Values
0
0.503665209
3000000
2500000
2000000
1500000
1000000
500000
0
-0.393797934 -0.169432148 0.054933637 0.279299423 0.503665209
Snap breaks to data values
16439460 Elements in Class
OK
Cancel
462951.016 2580871.027 Meters
Type here to search
ENG INTL 10:52 10-03-2022

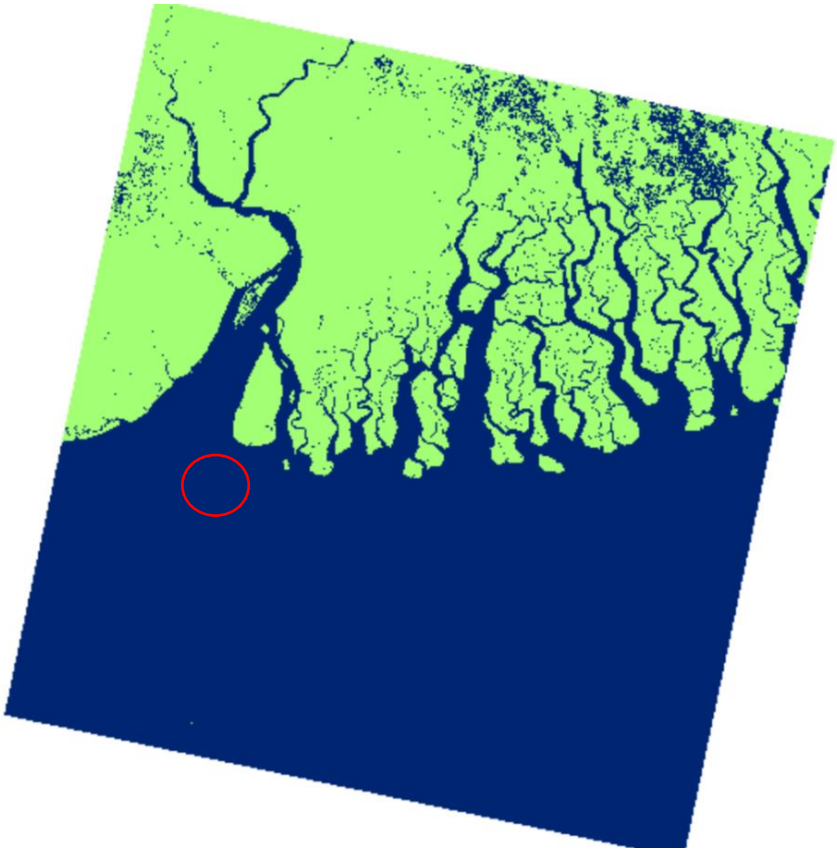
PTO

Comparing the NDWI for year 1988 and 2020, to analyse the Inundated region. The circled region of land is totally inundated, apart from that other region are have also been lost to sea from 1988 to 2020

Year :1988

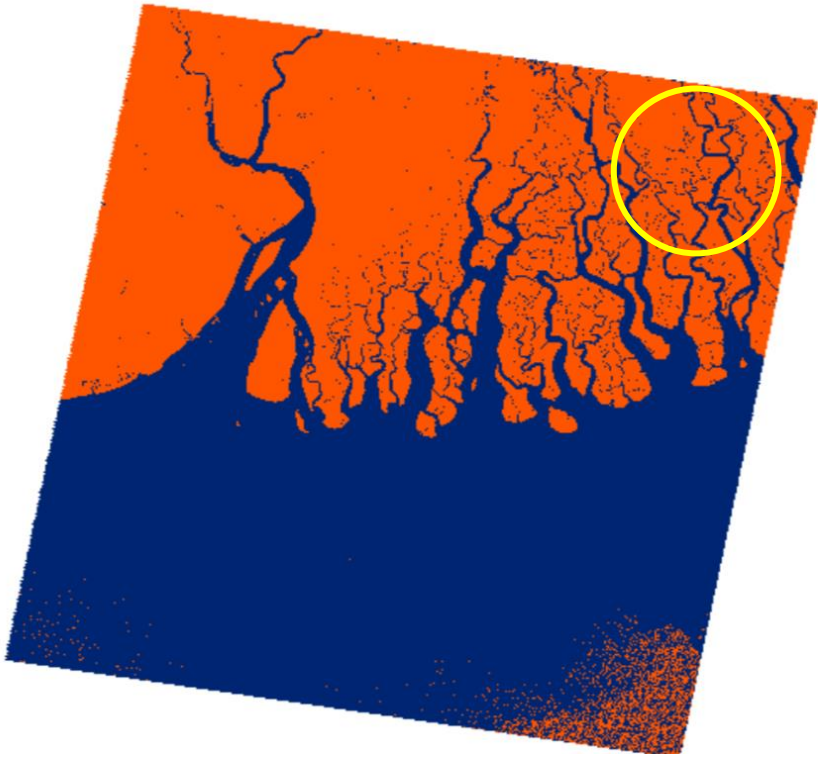


Year : 2020



NDVI from year 1988 and year 2020.

Year 1988



Year :2020