INTRODUCTION TO REMOTE SENSING

HW 1: Lab 1- Visualizing Landsat Data in GEE

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PART -1

Link : https://code.earthengine.google.com/cef59e300e1b088dca92a3bae6ddc2f7

A. What area of the world are you exploring? Why is this area of interest to you?

Ans: I am exploring the area of the world is Bangladesh. It is located in south asia.

Its interesting to me because Bangladesh is my homeland.

B. What is the range of dates available for selection? Search the metadata to assess the range of dates available.

Ans: 20220728 to 20220816

C. Modify the code above to select a range of dates of interest to you.

Ans: 20240816 to 20240602

D. How many images fit your search criteria?

Ans: 6 images.

E. Explore each of the printed collections. Go to features, select an image, and select bands. What are the differences between the collection called ‘collection’ and the one called ‘composite’?

Ans: Collection reflects the set of images of different bands and composite is the combining of images from collection with the selected bands. Here we use red green and blue bands for color composite.

F. What is this color composite called?

Ans: True color composite.



Image of True Color Composite

PART -2

Link: https://code.earthengine.google.com/97475e3de4195b77abf6cba4f35d9783

G. Which bits correspond to cloud and cloud shadows?

Ans: Bit 3 is Cloud

Bit 4 is Cloud Shadows

H. Which section of the code scales the DN value to Surface Reflectance units?

Ans: The code is in the cloudMaskL8 function and it is in following line

return image.updateMask(mask).multiply(0.0000275).add(-0.2)

I. Why are we selecting bits 3 and 4?

Ans: Bit 3 and Bit 4 we are selecting for removing cloud and cloud shadow pixels from the images.

J. Why are the visualization min and max values different for the masked and unmasked images?

Ans: The difference is that in the Unmasked image min and max pixel values are determined by the entire dataset and this unchangeable value range is very wide. On other hand for the masked image min and max values can be changed for rescaling and narrow range of pixel values has been considered for visualization.

K. Why do you think aggregating all images using the median is better than using the mean?

Ans: Aggregating images using the median instead of the mean can be advantageous in several scenarios, particularly when dealing with image data. The mean is affected by every value in the dataset, including outliers, which can skew the average significantly if there are extreme values. On the other hand, the median is less sensitive to outliers because it is the middle value of a sorted list. This means that extreme values have little to no effect on the median.

There by, aggregating multiple images using the median is better because it effectively reduces biasness and error which can ensure a relatively cloud free color composite.

L. What happens when you change the min and max values in visualization parameters?

Ans: Changing min and max values in visualization parameters affect the image display and brightness of images.

M. Change the bands in step 16 to create a traditional false-color composite.

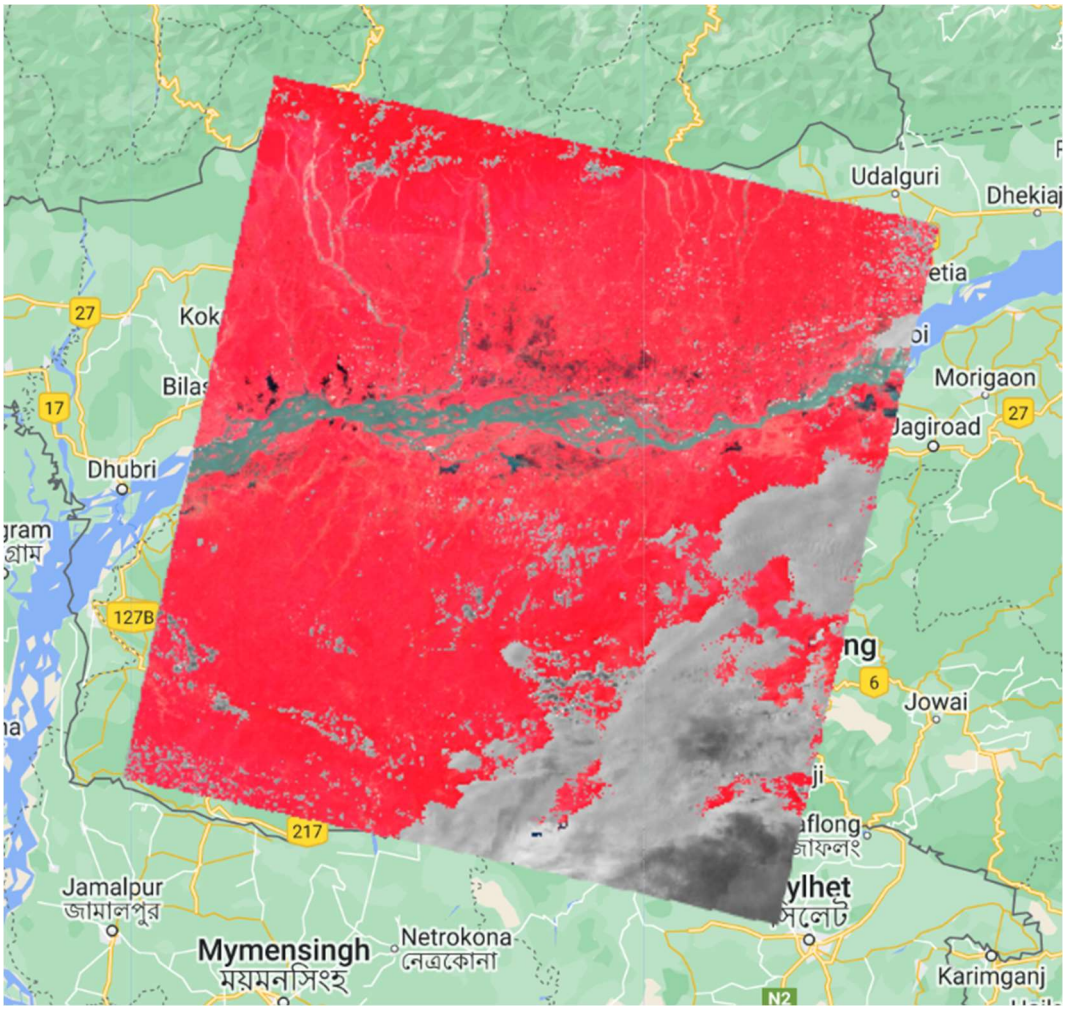


Image of false-color composite

ALL IMAGES

Part -1

Image-1: True Color Composite



Part -2

Image-1: Landsat 8 B5 Clouds Mask

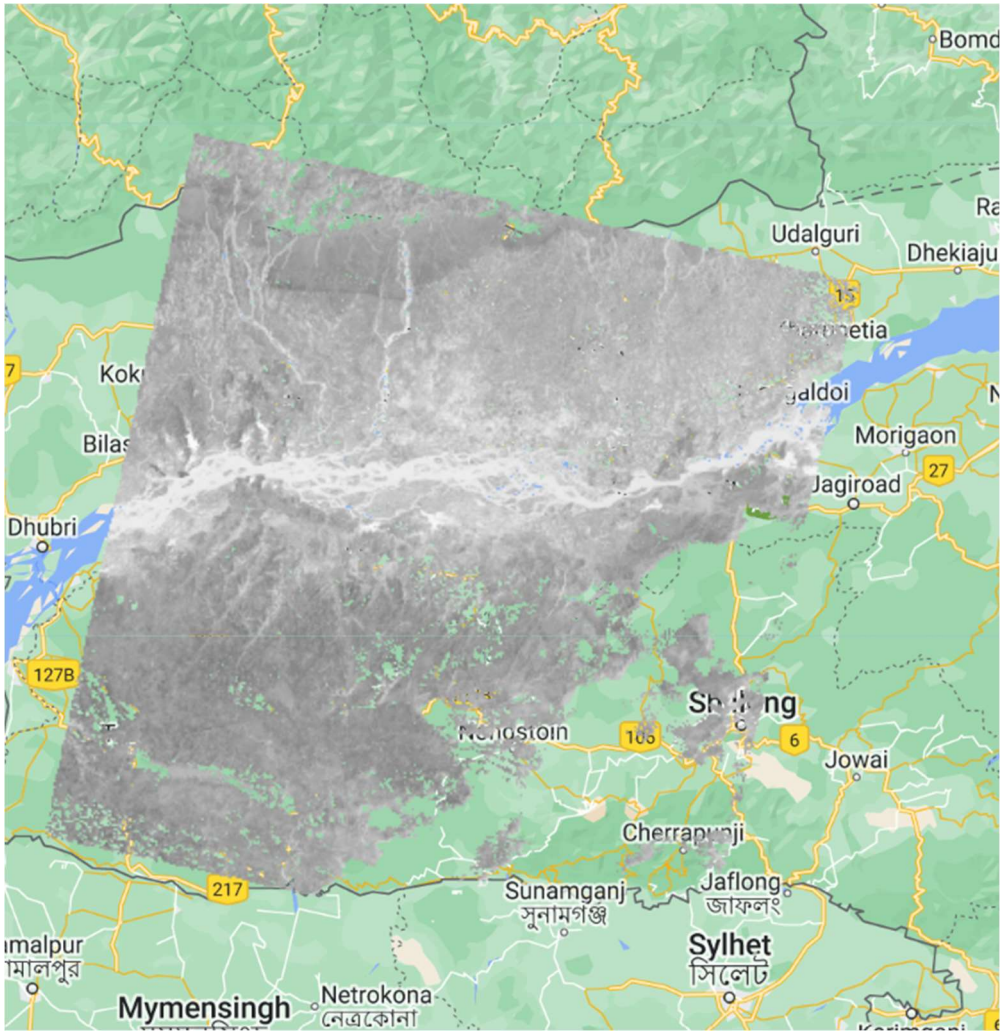


Image-2: Landsat 8 B5 Unmask

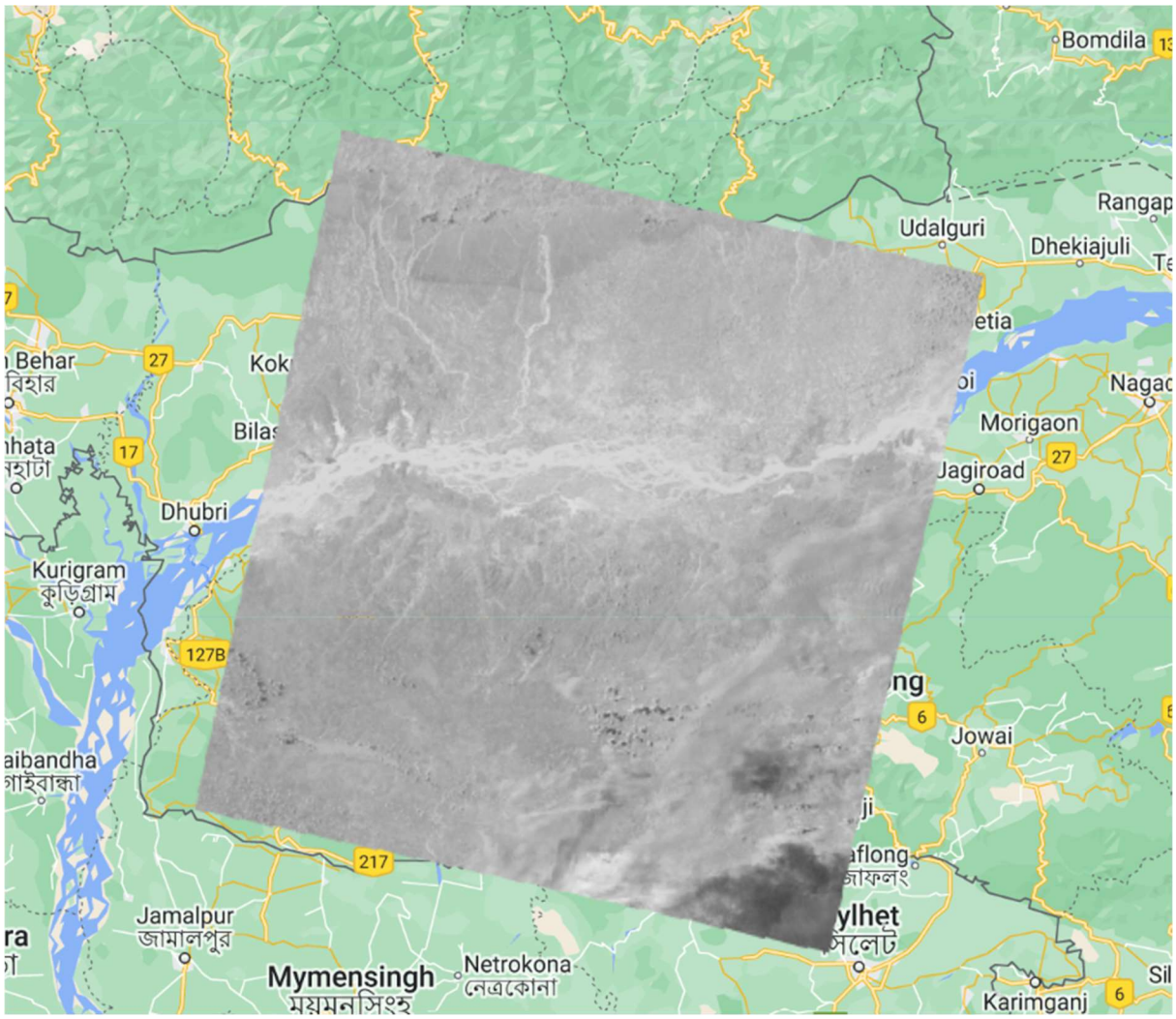


Image-3: Landsat 8 B5 Clouds Mask Color Composite

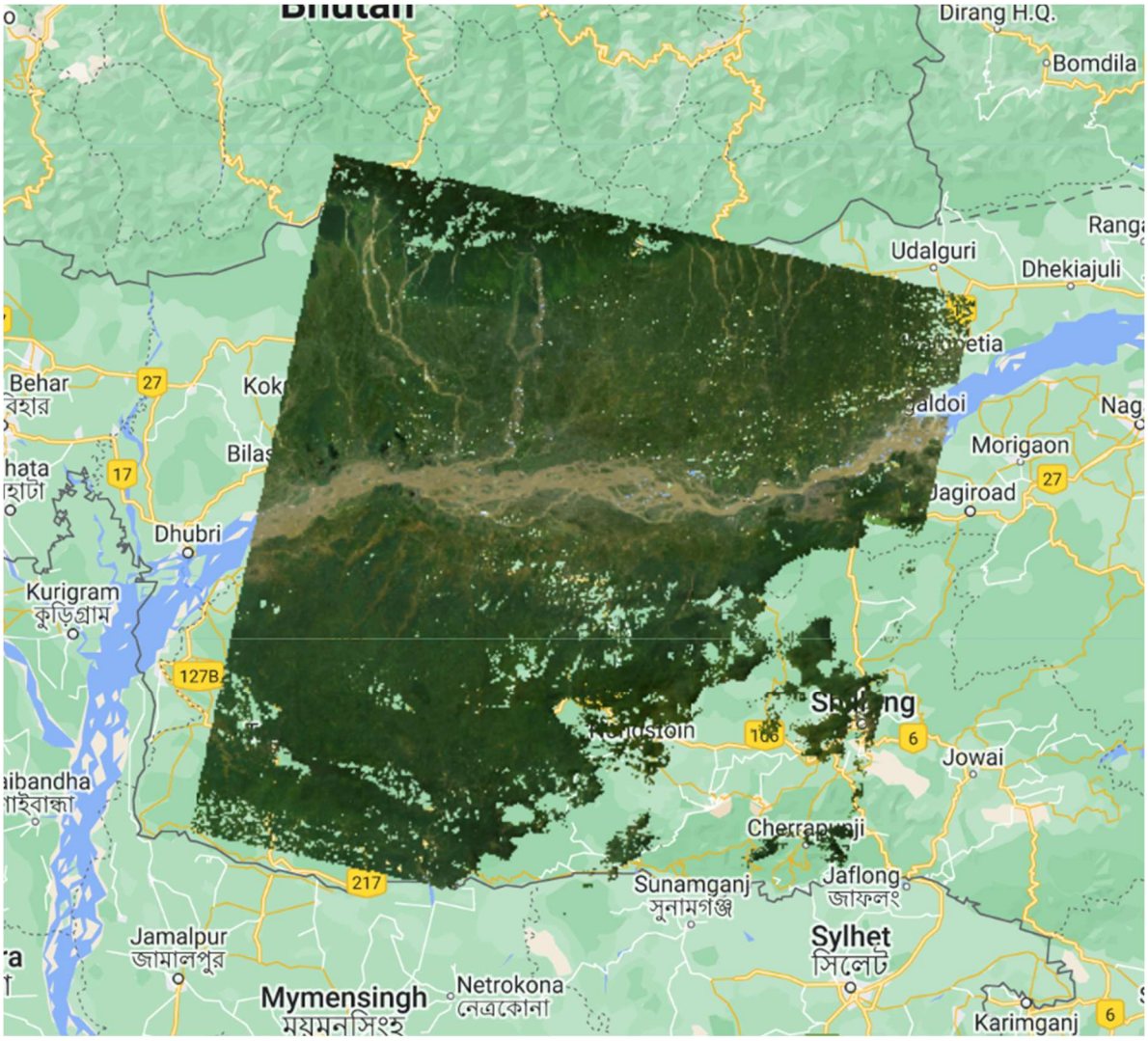
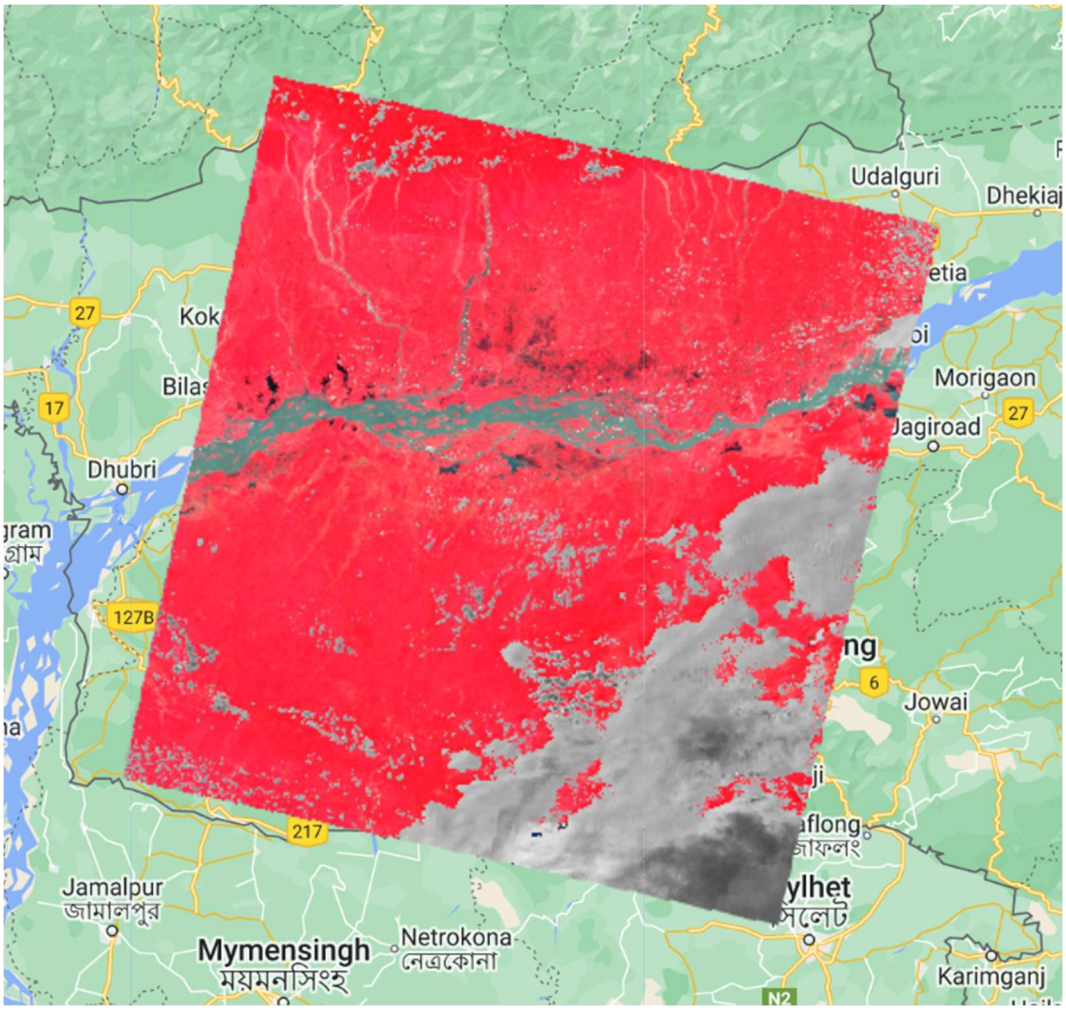


Image-4: False-color composite



FINISH