Temporal analysis in Google Earth Engine

Goal: To perform a temporal analysis of a forest fire event in Bandipur National Park, India, using Sentinel-2 satellite imagery on the Google Earth Engine (GEE) platform, focusing on assessing vegetation cover changes pre- and post-fire.

Objective:

- Use Sentinel-2 imagery to capture the state of vegetation before and after the forest fire (February 20th to 25th, 2019).
- Apply cloud masking and band selection techniques in GEE to enhance the analysis of fire-damaged areas.
- Visualize and quantify the changes in vegetation health and extent caused by the fire.
- Document and interpret findings to understand the spatial and temporal impact of the event on the ecosystem.

For the assignment my area of interest is a forest fire event in Bandipur National Park, India, using Sentinel-2 satellite imagery from the Google Earth Engine (GEE) platform. The fire occurred between February 20th and 25th, 2019.

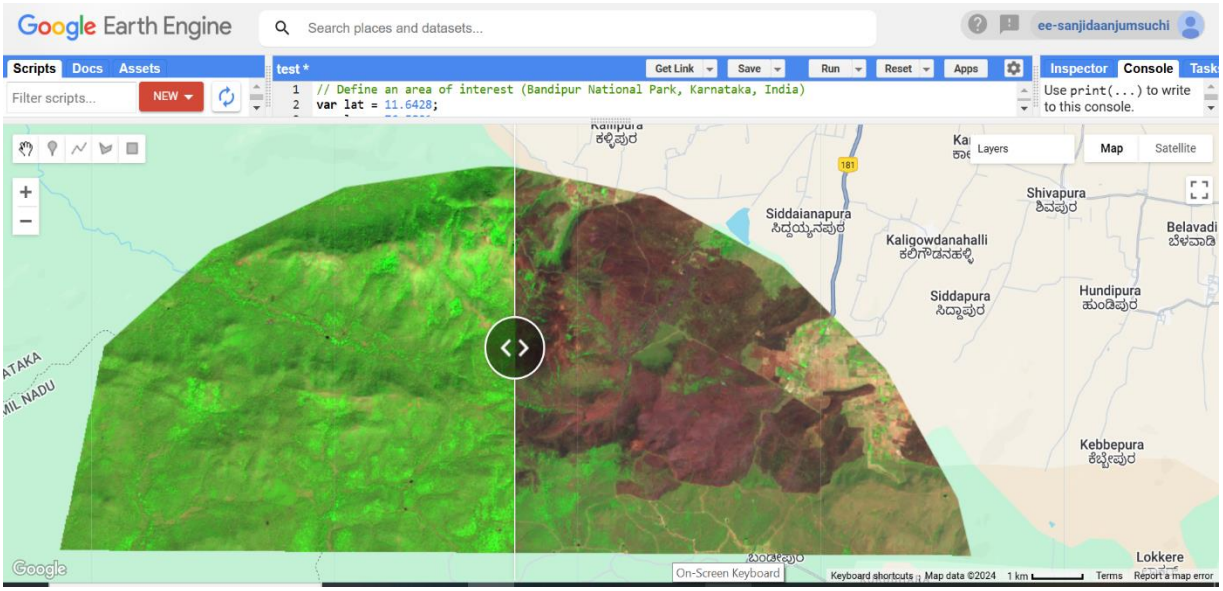

Figure-1

This split panel map shows the differences of “before” and “after” sentinel-2 images. This visual representation shows the changes in park’s vegetation cover. The green area shows more healthy and green vegetation cover and the “after” picture displays the reduced green grass and appears it in burnt which indicating potential fire damage.

Figure-2

Figure-3

From the figure-2 and Figure-3 it can be seen that latitude and longitude variables are changed according to my area of interest. Also, the marked area shows that the start and end date of the fire.

Sentinel-2 imagery was used to capture pre- and post-event conditions. Images with less than 30% cloud cover were selected. I changed the band ['B12', 'B8', 'B4'] to visualize different aspect.

Findings:

- **Visualization of Vegetation Changes:**

A split-panel map comparison of pre- and post-fire images revealed significant changes in vegetation cover.

The "before" images highlighted healthy green vegetation, while the "after" images depicted burnt areas with reduced vegetation, indicating fire damage.

- **Band Analysis:**

By selecting the bands ['B12', 'B8', 'B4'], specific aspects of vegetation health and fire impact were visualized, showing clear differences in spectral reflectance before and after the fire event.

- **Temporal Mapping:**

Temporal variables, including latitude and longitude, were adjusted for the area of interest to accurately map the start and end dates of the fire.

- **Cloud Cover Consideration:**

Sentinel-2 images with less than 30% cloud cover were prioritized to ensure data quality and analysis accuracy.

- **Impact Assessment:**

The analysis quantified vegetation loss, offering insights into the extent and intensity of the fire's impact on Bandipur National Park's ecosystem

Here is the link of the script:
https://code.earthengine.google.com/c027f8298b3c0ce4f86564220620cb61