

Wildfire Severity Assessment in Tenerife, Spain (2023) using Sentinel-2 Imagery

Demonstrated the use of Sentinel-2 satellite imagery and remote sensing indices to assess the severity of the 2023 wildfire in Tenerife.

Team Members:

Regina Deri

Affiliation:

University of Leicester

Course:

GY7709: Satellite Data Analysis with Python

Technologies & Skills Used

✓ Python (NumPy, Pandas, Matplotlib, Rasterio, Geopandas) | ✓ Remote Sensing | ✓ GIS | ✓ Satellite Data Analysis

Data Sources: Sentinel-2

Project Overview

Wildfires are a critical environmental challenge, causing significant ecological and socio-economic impacts. In August 2023, a devastating wildfire broke out on the Spanish island of Tenerife, burning thousands of hectares of forested land and forcing evacuations. This project utilized remote sensing techniques to assess the severity of the wildfire using Sentinel-2 satellite imagery.



Sentinel-2 Pre-fire false color representation (composite bands 12-8A-4)



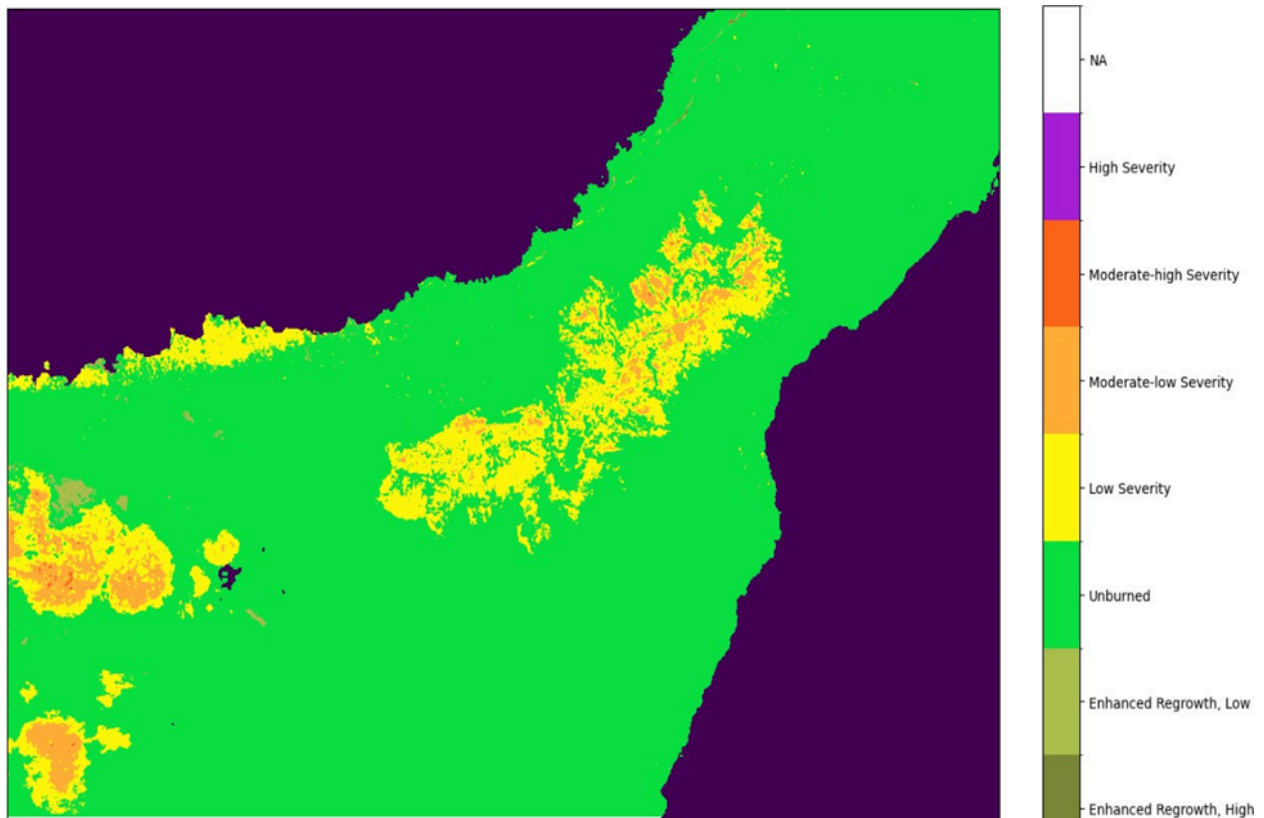
Sentinel-2 Post-fire false color representation (composite bands 12-8A-4)

Methodology

The study employed the **Normalized Burn Ratio (NBR)** and **Differenced NBR (dNBR)** indices to map fire severity levels and evaluate vegetation damage. Additionally, changes in the **Normalized Difference Vegetation Index (NDVI)** were analyzed to assess post-fire vegetation recovery. The dNBR values were classified based on USGS fire severity standards, highlighting areas of **low to high burn severity** across the landscape.

Key Findings

- The fire severity map revealed significant decreases in NBR values in burned areas, confirming widespread vegetation loss.
- dNBR analysis successfully delineated fire-affected regions, with high-severity areas identified for targeted land management efforts.
- A weak positive correlation was observed between dNBR and NDVI changes, suggesting that post-fire vegetation recovery dynamics vary based on environmental factors.



Conclusion

This study demonstrates the effectiveness of Sentinel-2 remote sensing data for wildfire severity assessment. The generated fire severity map provides valuable insights for land managers, aiding in post-fire recovery planning and ecosystem restoration.