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Title: Assess climate factors and vegetation conditions influencing burn severity in California

Summary

Wildfires across the United States are becoming more frequent and more severe every year. Climate change is impacting the occurrence of wildfires in areas experiencing chaparral dieback in California as example, or other landcover types. This project seeks to understand the relationship between climate factors, seasonal conditions, and vegetation conditions (Enhanced Vegetation Index EVI) in California, threats from increasing wildfire frequency in California.

Research Question: What are the climate factors (seasonality) and vegetation conditions influencing fire severity in California?

Hypothesis: High temperatures, low precipitation, and lack of health vegetation significantly contribute to high fire severity in California

Datasets	Purpose	Source
Landsat 8 // Sentinel 2	Enhanced Vegetation Index (EVI)	Google Earth Engine by Geemap
Burn Severity	Monitoring Trends in Burn Severity (MTBS) dataset from 1982 – 2022	https://www.mtbs.gov Google Earth Engine dataset
Wildfire Boundary Polygons from USGS and CalFire in cloud native formats	Cloud Native serializations of publicly available fire data from USGS and Calfire. Calfire data includes controlled burn treatments. Data through 2022	https://source.coop/repositories/cboettig/fire/description
Climate data	Mean of Maximum Temperature, Mean of Minimum Temperature, Mean Precipitation	https://open-meteo.com/en/docs
Land Cover Type		https://landfire.gov/vegetation/evc

Scaling up: Also, notebooks can scale up to understand wildfires in other regions but need to be adjusted based on a bounding box or ID_date of the wildfire.

Outcomes from each notebook
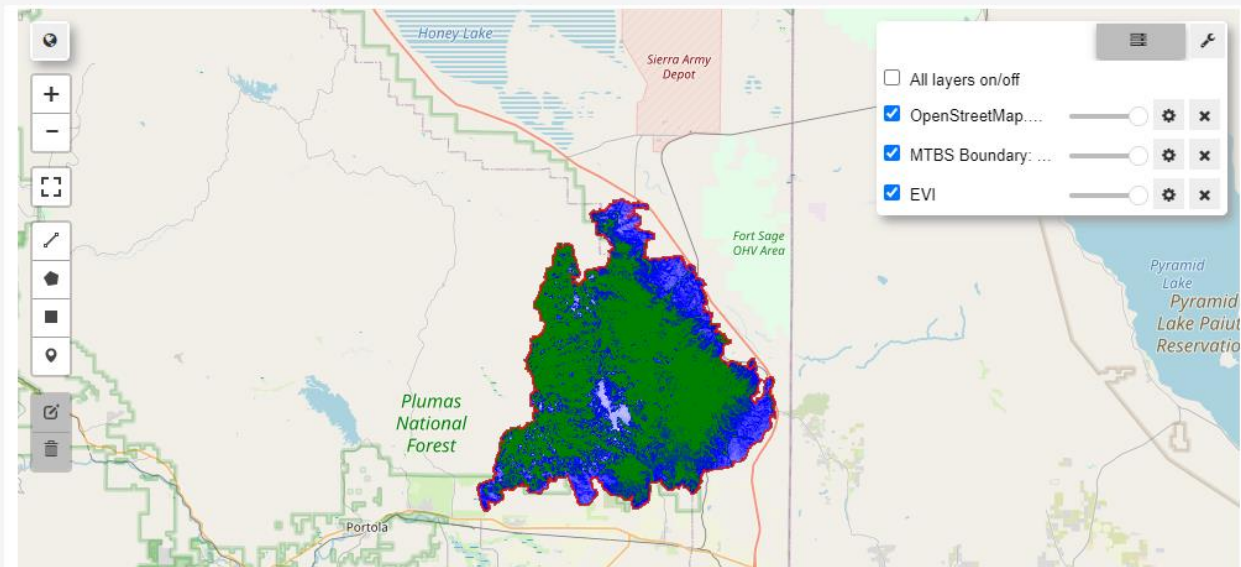
fires_notebook.ipynb
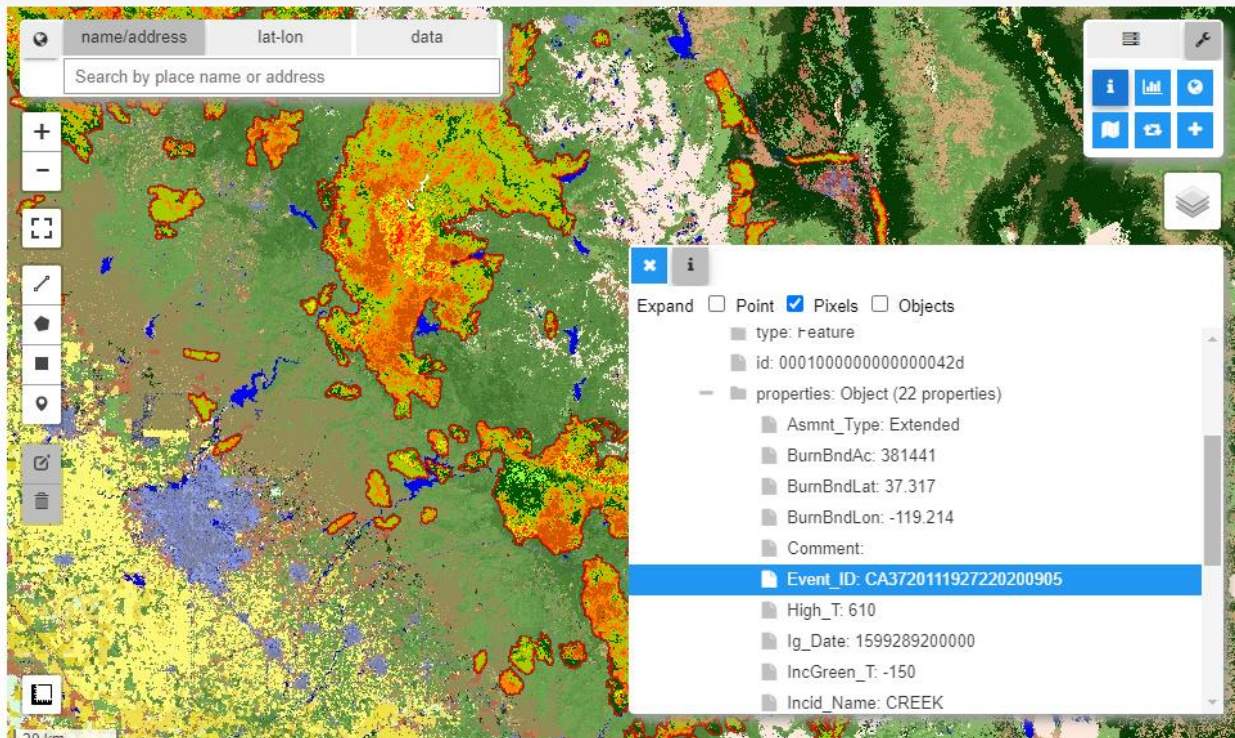
Evi.api.ipynb

Generating EVI for feature with Event_ID: CA3983912034520210702
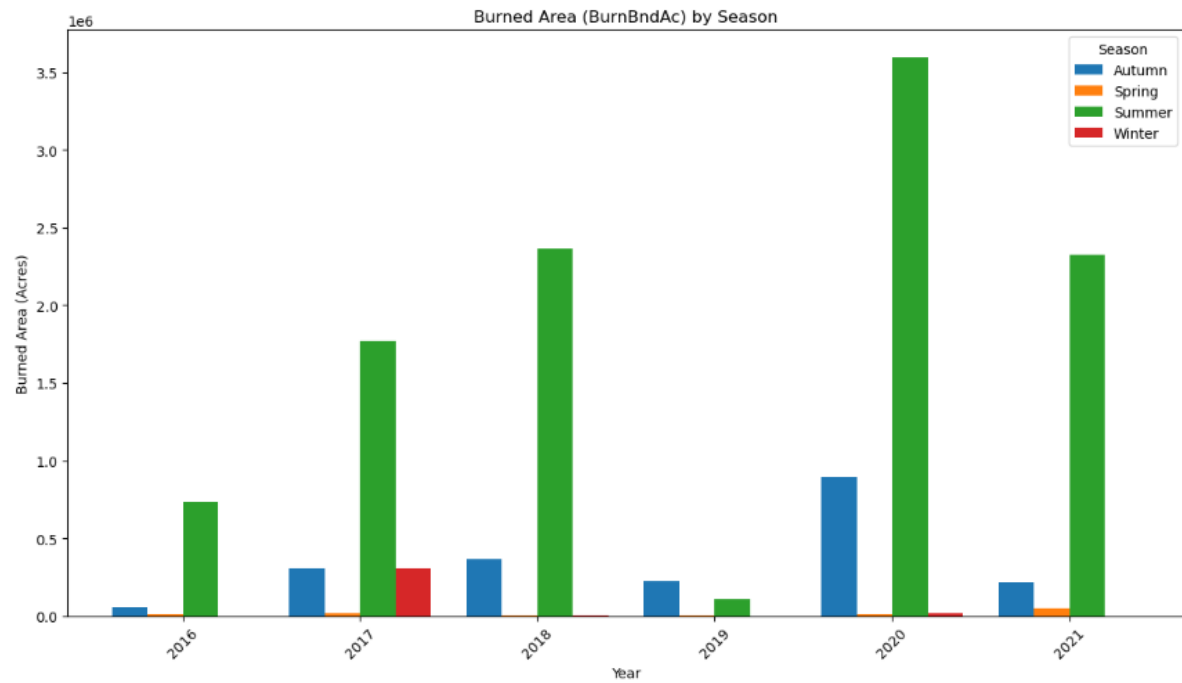Ig_Date: 2021-07-02
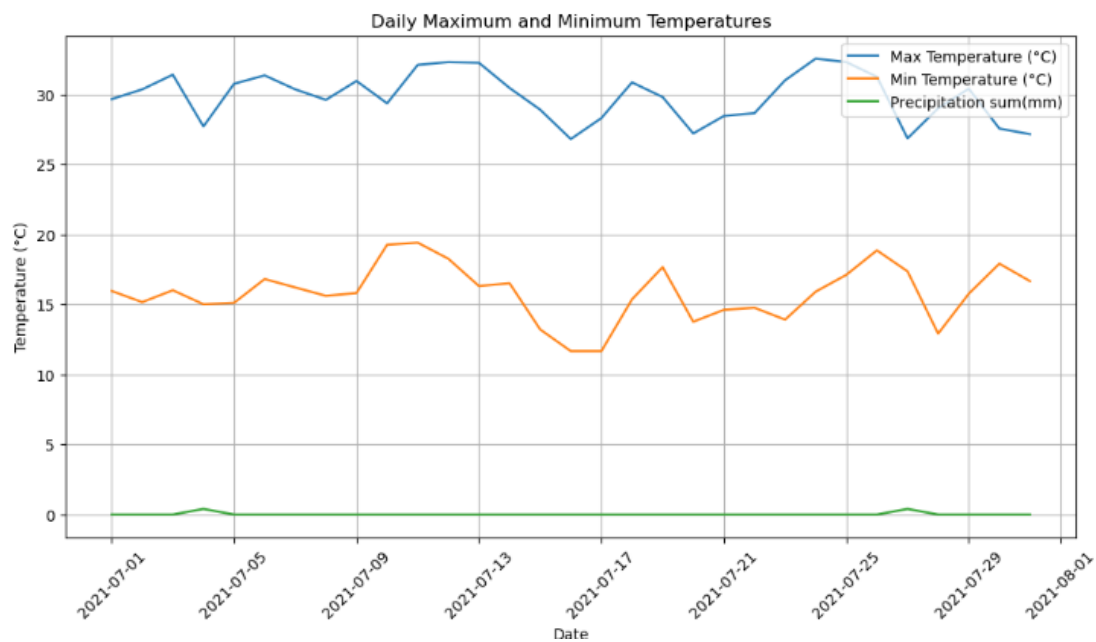Start Date: 2021-06-22
End Date: 2021-07-12

Mtbs_example.ipynb
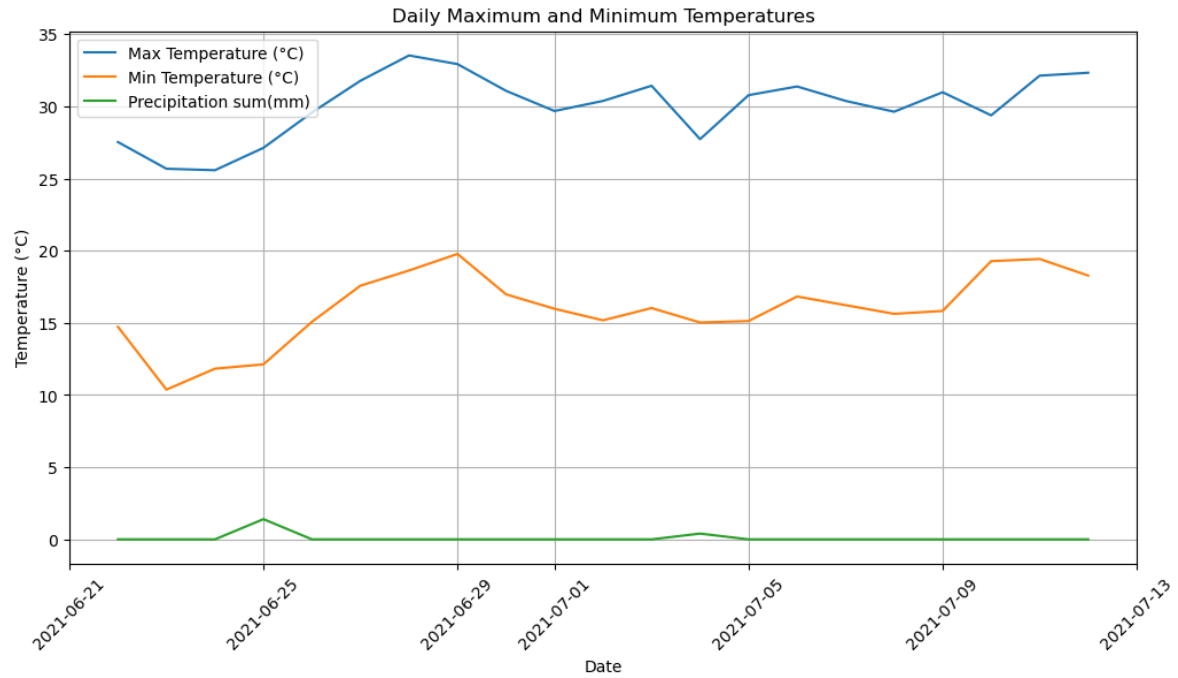
Understand seasonality of wildfires in California

Burned Area (BurnBndAc) by Season

Openmeteo_example.ipynb

Display weather conditions chart by the month giving an event ID_date

Daily Maximum and Minimum Temperatures

Display weather conditions of Ten Days Before and After event ID_date

Daily Maximum and Minimum Temperatures

Mtbs_source_coop (Leaf Map)

Wildfire Severity by State
- Low
- Medium
- High

AFFGEOID: 0400000US06

GEOID: 06

STUSPS: CA

NAME: California

LSAD: 00

ALAND: 403671756816

AWATER: 20293573058

State: CA

Wildfire Count: 1764

Severity: High