

Mapping Seasonal Vegetation Change

Submitted: March 2, 2024

Principal Consultants: Gautam Mathur & Lawson Schultz

Problem Statement: In order to assess the impact of seasonal changes on vegetation patterns across the United States, a conservation organization needs to prepare visualizations focusing on the transition from August to November.

Data Source: MODIS vegetation index 1km 2010 data from USGS Earth Explorer and NASA Earth Data

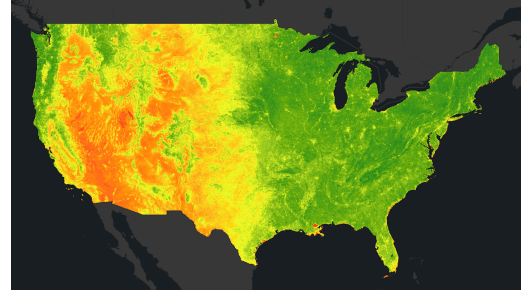


Figure 1: Enhanced Vegetation Index (EVI) across the contiguous United States, August 2010

Mapping Median EVI Across the Contiguous US August to November

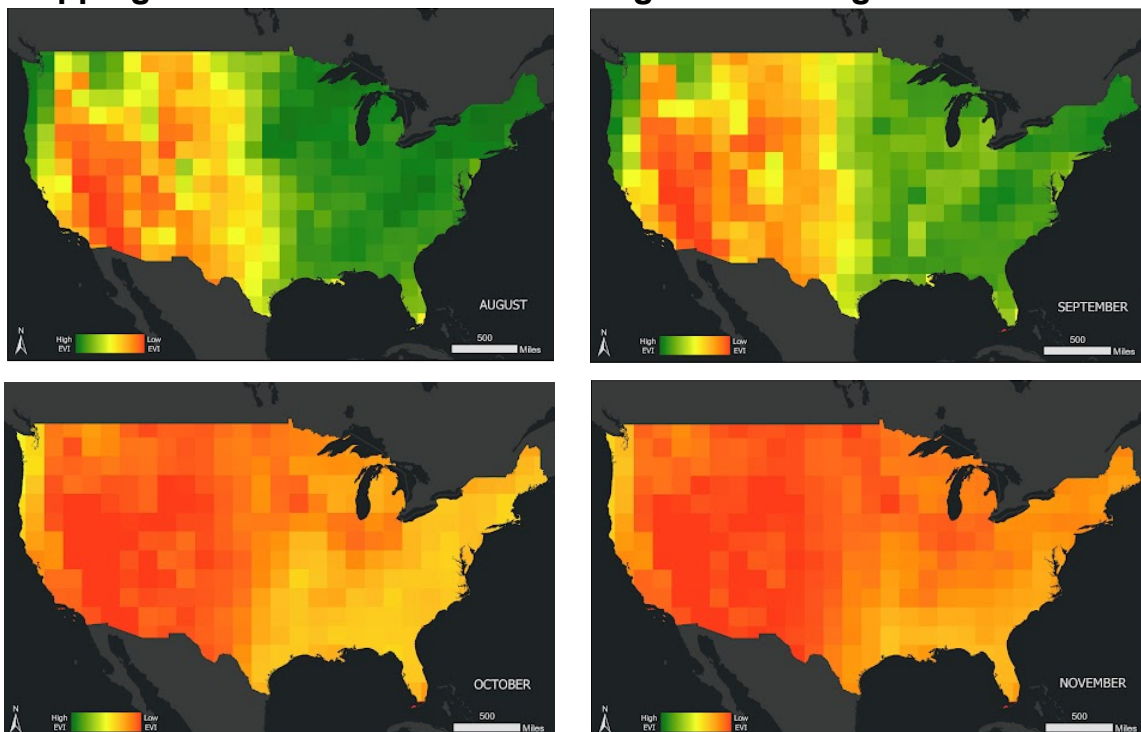


Figure 2: Median Enhanced Vegetation Index (EVI) values for non overlapping 150 km X 1500 km squares across the contiguous United States, for months August to September.

As can be seen from figure 1, the data is very detailed, and shows the intricate details of how vegetation productivity changes through the USA. While this can be seen as beneficial, looking at a large area, through multiple stages of time, with such detail, provides a large amount of information that can be overwhelming and distracting for the viewer. To understand general patterns and how they change through time, it is therefore better to aggregate the data. We

used the block statistics tool to calculate the median EVI for cells in non overlapping 150 X 150 cell blocks. This simplifies the patterns, and makes it easier to visualize.

We used the raster calculator to determine how much EVI changed between August and November overall. Through block statistics, it is much easier to notice that:

- i) There have been no major positive changes in vegetation productivity on a country-wide scale
- ii) The eastern part of the country saw a significantly greater decrease in vegetation productivity
- iii) EVI stayed relatively stagnant in the Southwestern United States, while the northwest experienced slight decreases.
- iv) In the Eastern portion of the United States, the largest decreases were concentrated around the north, with the highest seen around the midwestern states, and in the NorthEast.

Change in EVI Across the Contiguous US (Aug-Nov)

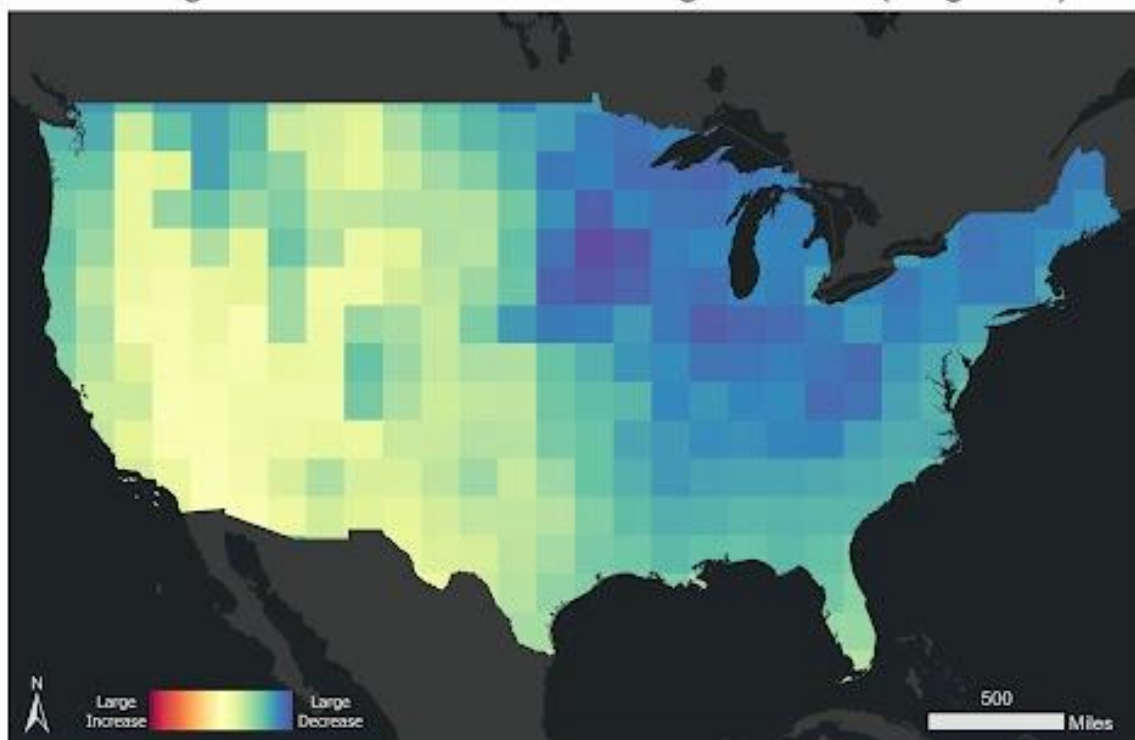


Figure 3: Median change in Enhanced Vegetation Index (EVI) values for non overlapping 150 km X 1500 km squares across the contiguous United States, between months August to September.