Climate, Leaf Change, and Tourism on the Blue Ridge Parkway

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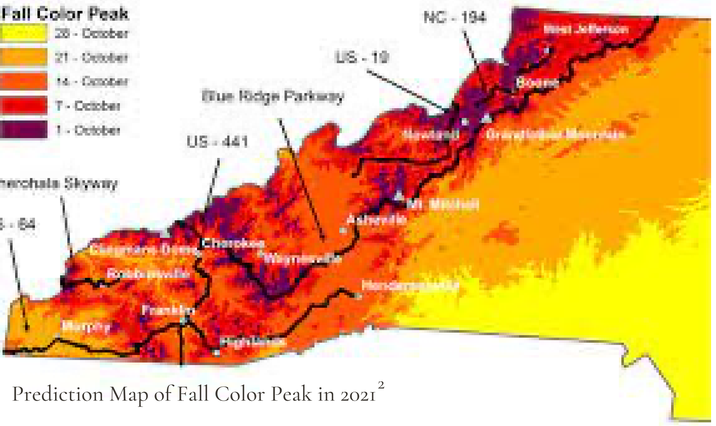
Background

How do temperature and precipitation affect when the leaves change color and does this in turn cause a shift in tourism due to variation in predictions and actual change on the Blue Ridge Parkway between 2012 and 2021?

•Each year tourists flock to the Blue Ridge Parkway (BRP) to see the sights of the leaves changing color

•Typically, predictions and historical reference suggest tourists should come visit in mid-October[1]

Peak is generally considered when the most amount of trees are at their most colorful.



Prediction Map of Fall Color Peak in 2021[2]

Data

Three types of data were used: Fall Color Change, Climate, and Tourism

All data sets range from 2012-2021

- Fall Color Change data were collected from the Fall Color Guy[3] descriptions which were weekly and turned into quantative data going from -3 to 0 back to -3
- Climate data was collected from NOAA[4], looking at North Carolina Division 2 average temperature and average precipitation per month
- Tourism data was collected by the National Park Service[5] tracking monthly recreational visitors to the BRP

After all the data was formatted graphs were made depicting each year between 2012-2021.

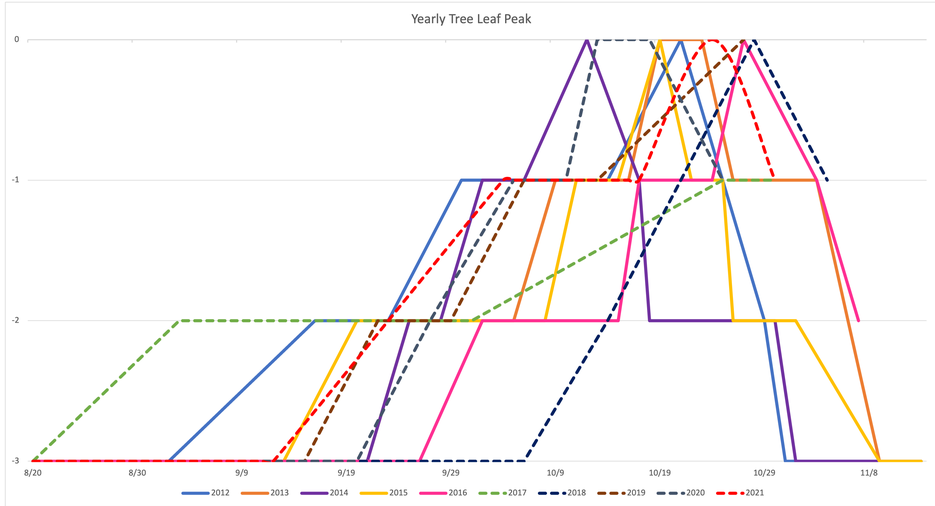


Figure 1: Displays when the tree leaves change color and reach their peak for the years 2012-2021

Methodology

Figure 1: Leaf Change between August 20-Nov 11,Figure 2: Tourism on the BRP each month, Figure 3: Average Temperature each month, and Figure 4:Average Precipitation each month.

After the graphs were made averages of the fall color data were taken to convert it to a monthly scale in order to run significance tests.

To determine the significance, t-Test were used. I tested between leaf change and precipitation, temperature, and tourism indepedently for the entirety of the data. I also tested these variables at the yearly scale.

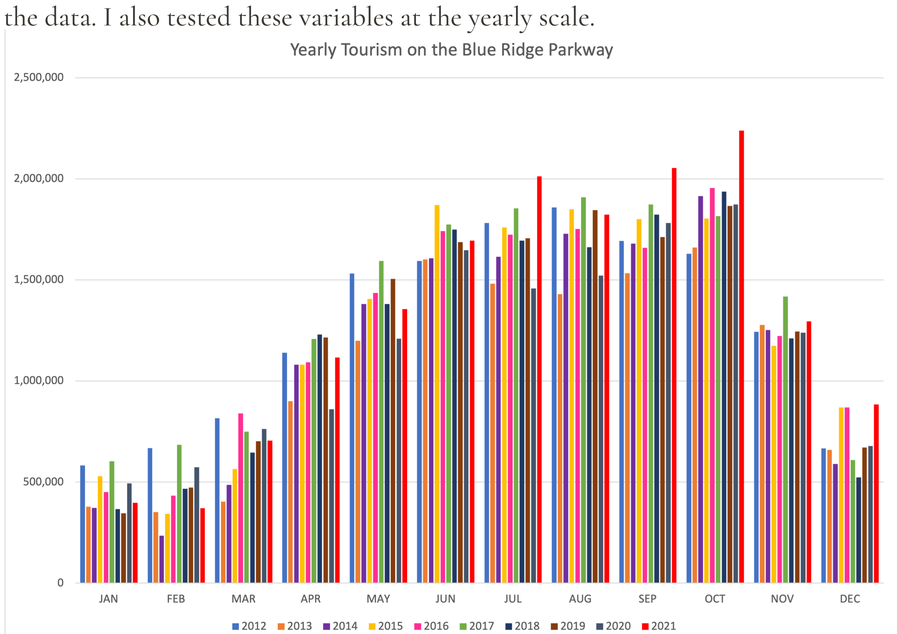


Figure 2: Shows monthly tourism on the Blue Ridge Parkway for the years 2012-2021

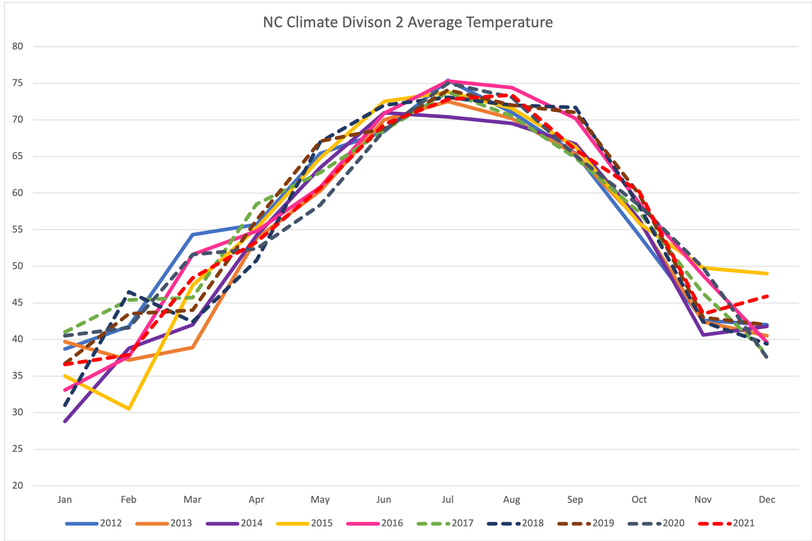


Figure 3: Displays average temperature in NC Climate Divison 2 for the years 2012-2021

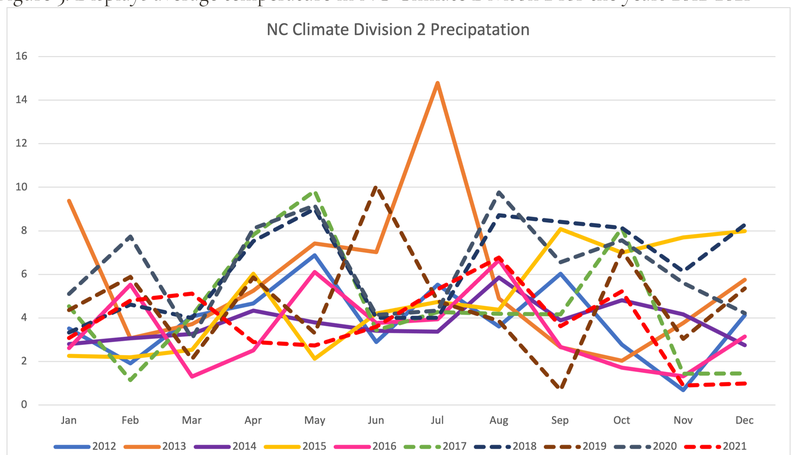


Figure 4: Displays average precipitation in NC Climate Divison 2 for the years 2012-2021

Results

The t-Tests for overall variation for leaf change and all three variables were highly significant. For the yearly t-Tests all tests were statistically significant except 2019 leaf change and precipitation, which had a p-value of 0.09.

This means that climate variables do impact when the leaves change color and that the leaf color impacts when tourists come. However, there were several limitations including having to take monthly averages of leaf color so more tests should be done to determine if this remains true at smaller scales like weekly or daily.

1: Mazurek, A. (2021, September 10). A fall guide to the Blue Ridge Parkway. The Washington Post. https://www.washingtonpost.com/lifestyle/travel/blue-ridge-parkway-fall-guide/2021/09/09/fa9dbfd2-0c08-11ec-aea1-42a8138f132a_story.html

2: Fall foliage 2021 Forecast and guide. Blue Ridge Mountain Life. (2021, November 11). https://blueridgemountainlife.com/fall-foliage/

3:Fall color report archives. WataugaOnline.com. (2022, February 21). from https://wataugaonline.com/fall-color-report-archives/

4: Index of /data/climdiv/access. (2014, June). [Dataset]. National Oceanic and Atmospheric Administration. https://www.ncei.noaa.gov/data/climdiv/access/

5: Stats Report Viewer. (1979). [Dataset]. National Park Service. https://irma.nps.gov/STATS/SSRSReports/Park%20Specific%20Reports/Recreation%20Visitors%20By%20Month%20(1979%20-%20Last%20Calendar%20Year)?Park=BLRI