

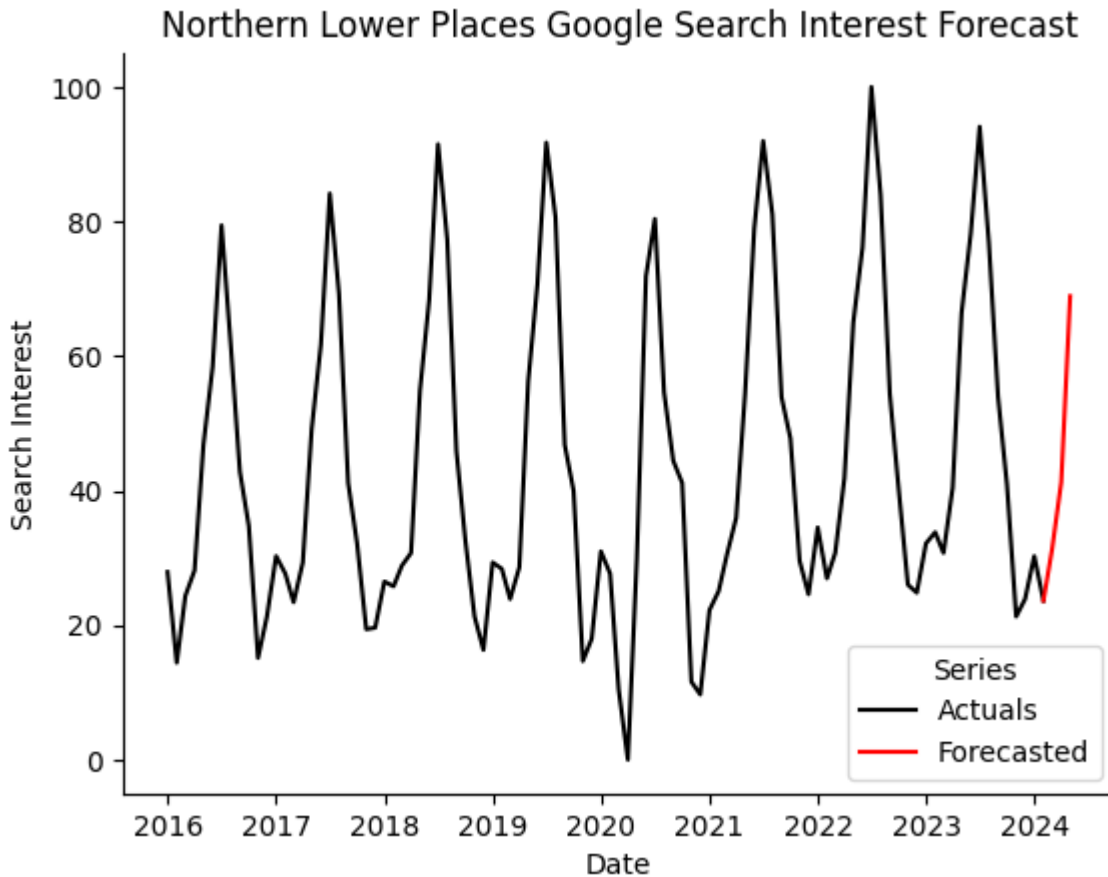
# March-May 2024 Northern Michigan Search Interest Forecast

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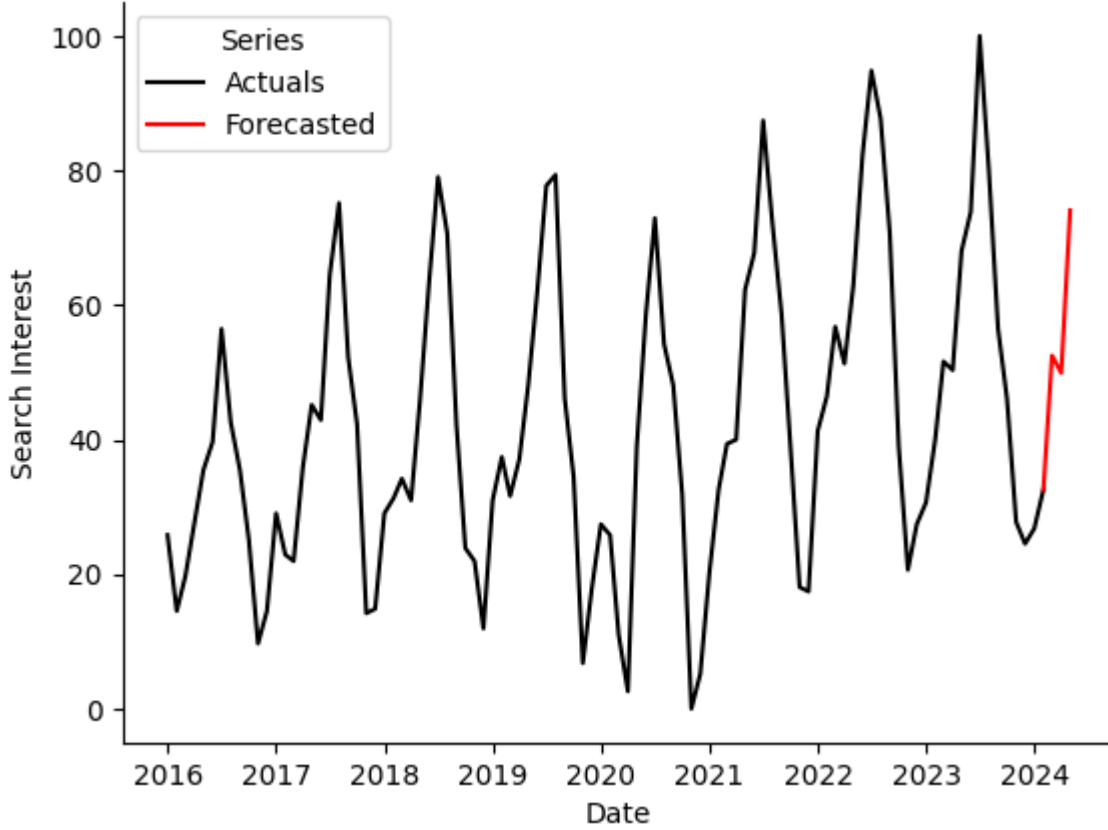
Below are the search interest forecasts for the combined Northern Lower and combined Upper Pensinsula places for March, April, and May 2024. Note that the possible range for historical search interest is normalized to a maximum of 100 and a minimum of 0, but forecasts outside this range are permissible as these values are forecasted to be outside the historical range.

Also provided are barcharts comparing the average search interest for the forecast months (March, April, May) to the same months in previous years.

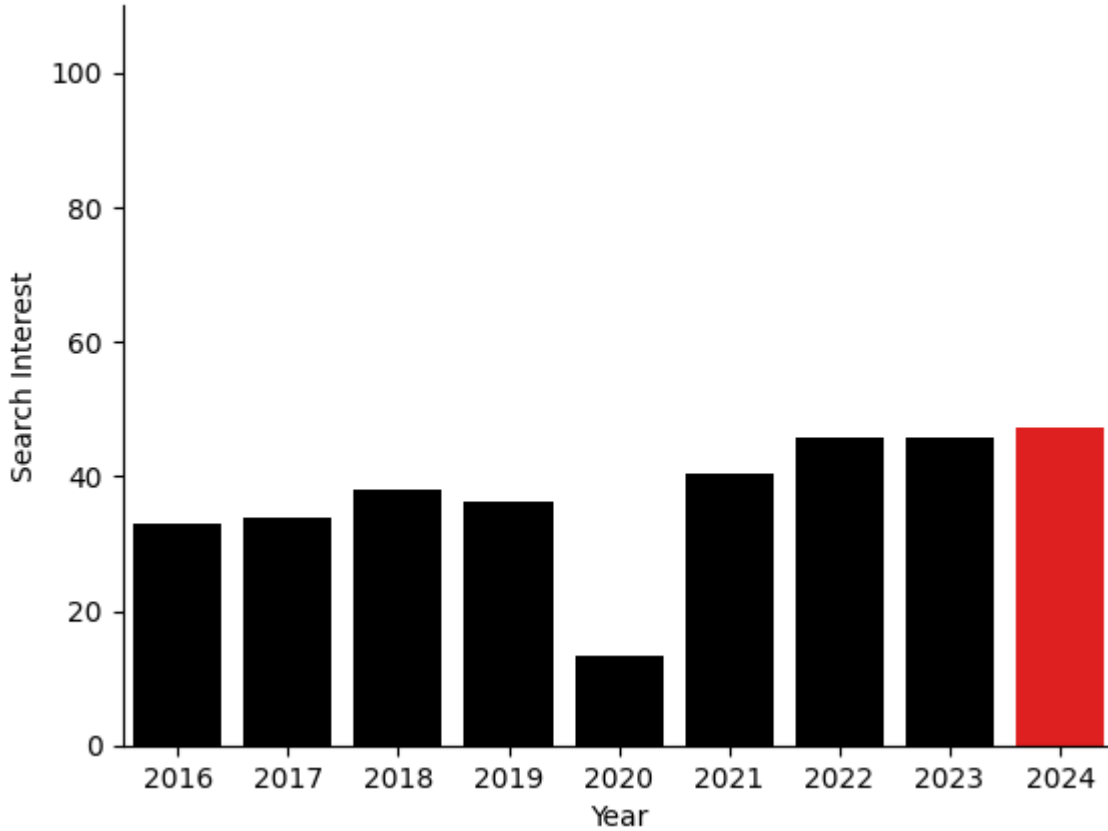
The forecast for both peninsulas is higher than last year.



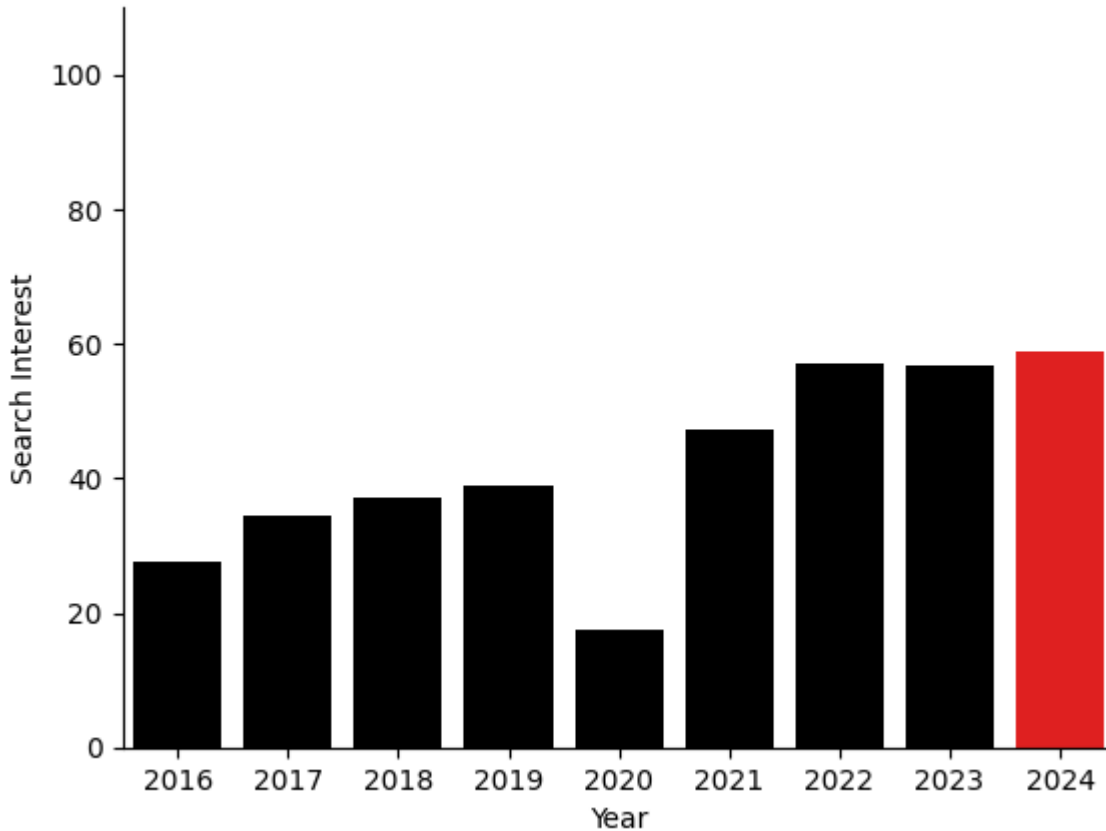
Upper Pensinsula Places Google Search Interest Forecast



Northern Lower Search Interest Averaged for March, April, and May



## Upper Peninsula Search Interest Averaged for March, April, and May



The following table shows the top five places that are forecasted to have the highest search interest compared to the same time period in 2023. With the new modeling form implemented last month, model forecasts do not depend on last actuals and differences from past year are due to weather and gasoline prices. From the original research used in this project, we know that many places in the western Lower Peninsula and some places in the Upper Peninsula are particularly sensitive to weather and/or gasoline prices. As the forecast currently shows warmer than usual weather, these are the places from the western Lower and Upper Peninsula show the largest expected changes.

	Place	Peninsula	Difference
0	Free Soil	Lower	9.3
1	Tustin	Lower	8.1
2	Gladstone	Upper	8.1
3	Bruce Crossing	Upper	6.9
4	Parkdale	Lower	6.6

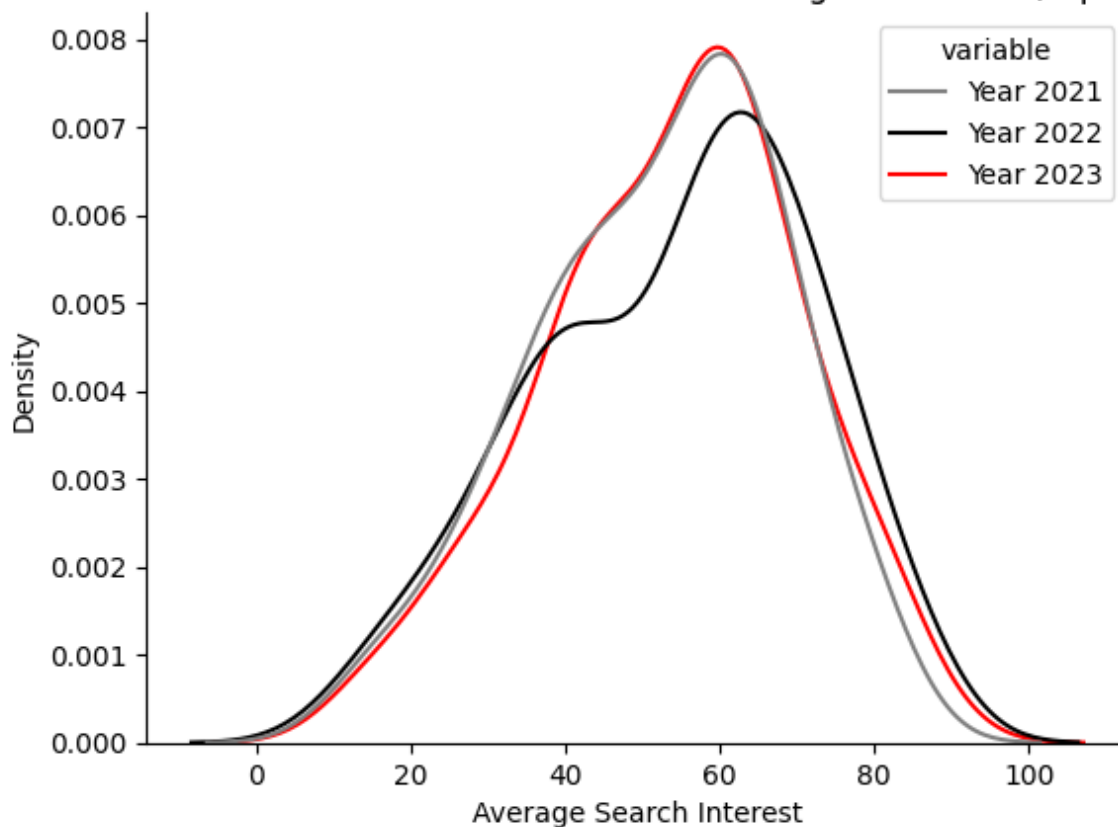
Three things impact the value of the search interest forecasts for each place.

1. The previous year's monthly value for each individual place.

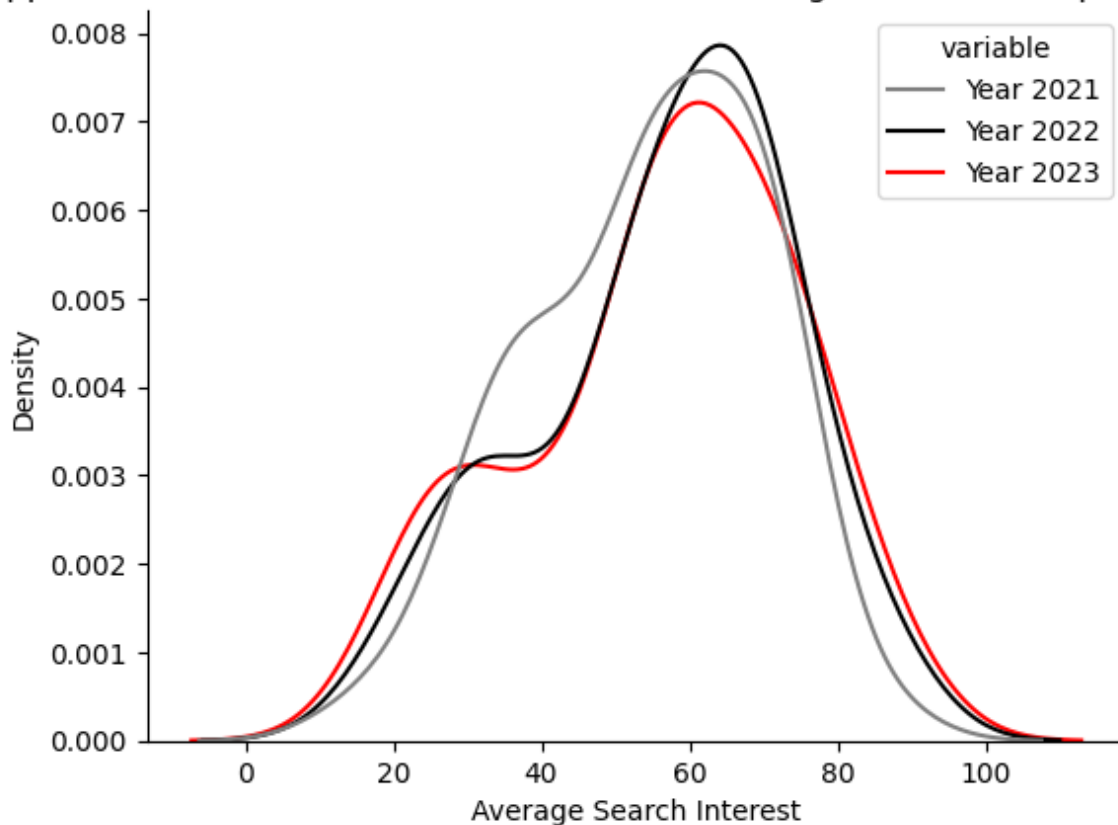
2. While not directly impacting the model forecast, seasonal (12 mo) differencing accounts for the fact that search interest is higher in some portions of the year than others (so previous year actual is impacted).
3. Model difference: based on forecasted weather and gas price changes, the model will predict 12 mo changes from the previous year for each individual place. These new levels are aggregated via regression to the peninsula level series.

The two KDE plots below plot the distributions of the individual place actual values for the months of March, April, and May for the previous three years. Note that the values for 2023 serve as the last actual values for 2024. For the Lower Peninsula, the 2023 values are lower than 2022 and similar to 2021. For the Upper Peninsula, the 2023 values are similar to 2022 and higher than 2021.

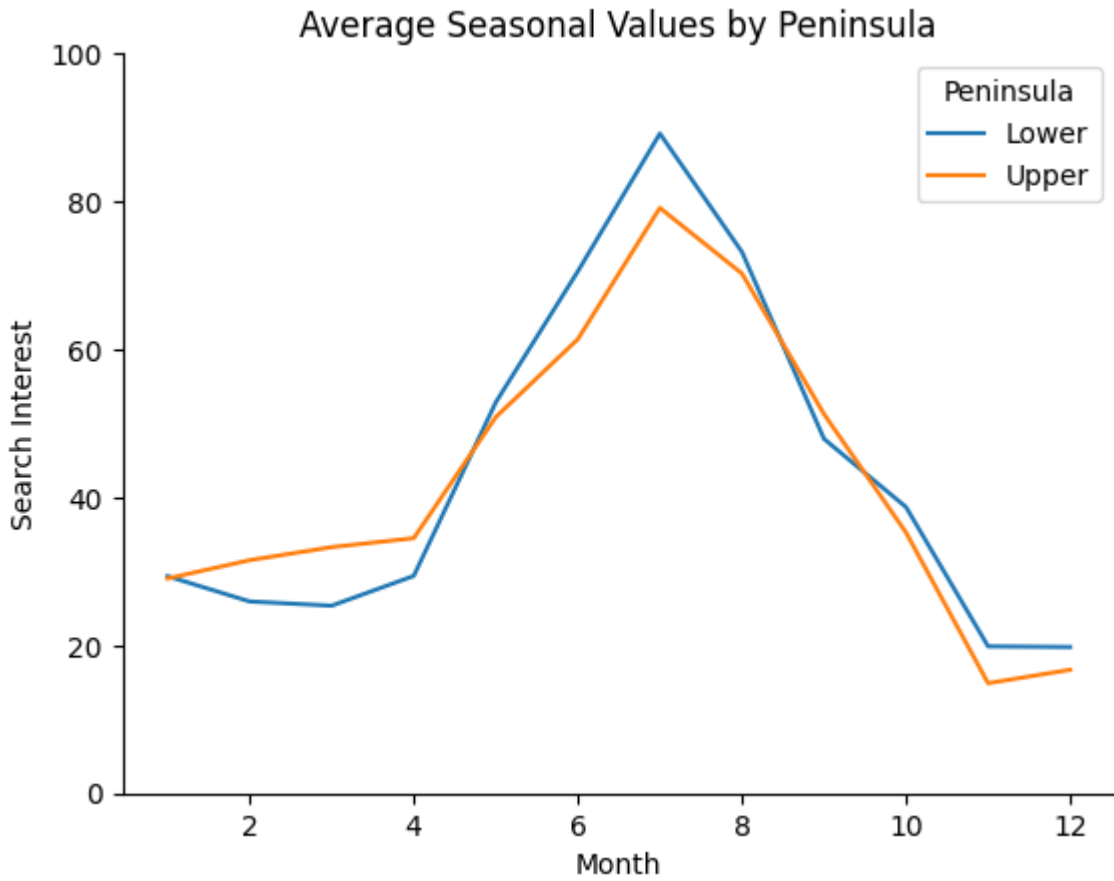
Lower Peninsula Place Level Search Interest Averaged for March, April, and May



### Upper Peninsula Place Level Search Interest Averaged for March, April, and May



The following figure shows the aggregate average search interest for each month. Both the Upper and Lower Pensinsulas have a seasonal peak in July/August with the Lower Peninsula peak solidly in July. The Upper Peninsula has higher values for January-March likely due to winter snow sports like snowmobiling. For the March-May forecast period, we should expect steadily increasing search interest.



Finally, forecasts are determined by the forecasted place level change from the previous year based on weather and gasoline prices. For both peninsulas, the most likely forecasted change from the previous year is positive, but more so for the Upper Peninsula where the forecasted change is more right skewed.

Model Forecasted Change by Peninsula

