
Monarch Migration Analysis

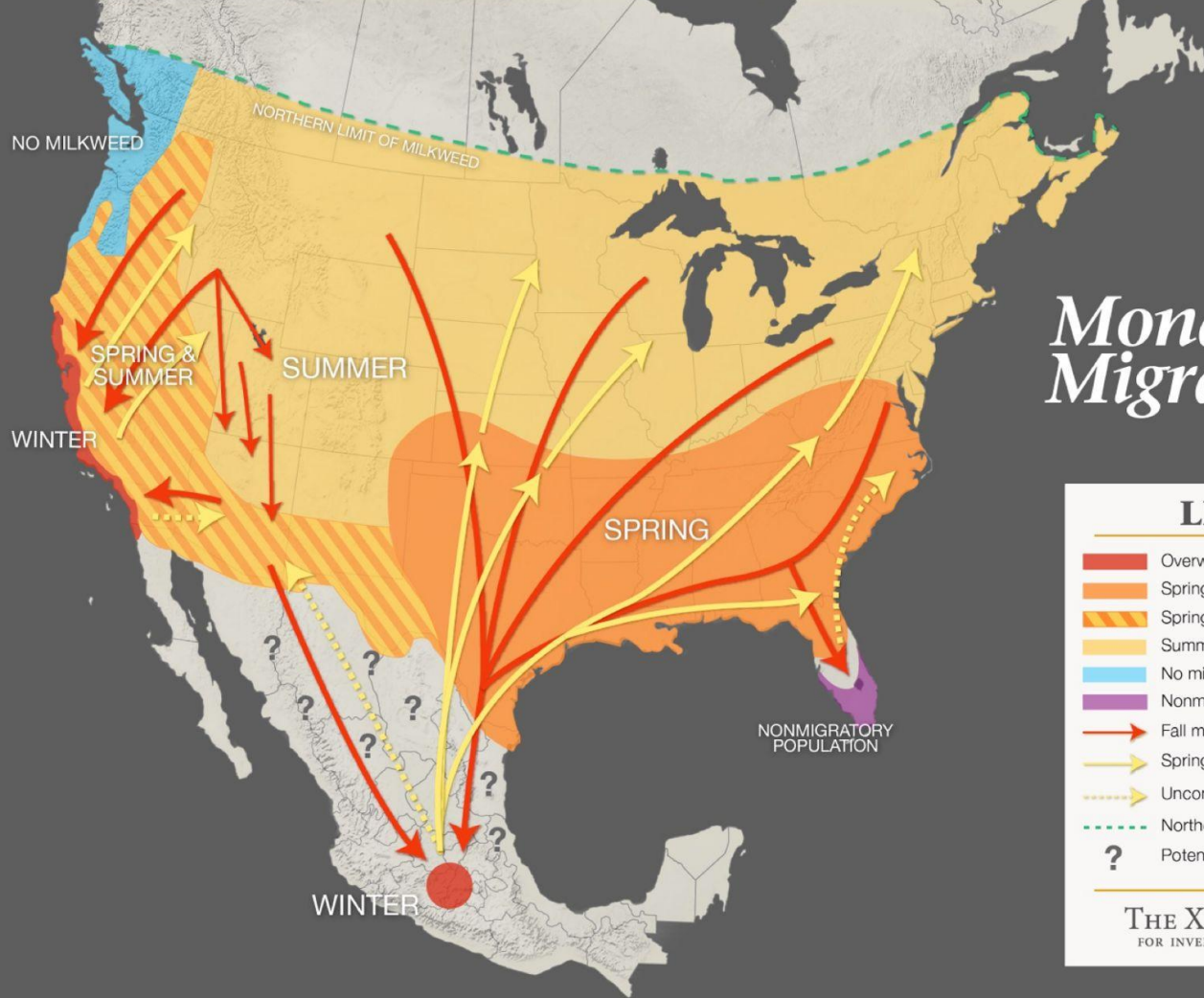


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Google Data Analytics Case Study
January, 2022



Background

- Eastern monarchs butterflies (*Danaus plexippus*) leave their overwintering sites in the mountains of Mexico each spring
 - They spend the summer traveling north and breeding
 - After 2-3 generations, and starting in August, the monarch population travels south to return to the overwintering site
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Monarch Migration

Spring & Fall

LEGEND

- █ Overwintering areas
- █ Spring breeding areas
- █ Spring & summer breeding areas
- █ Summer breeding areas
- █ No milkweed - no breeding area
- █ Nonmigratory population
- Fall migration
- Spring migration
- Unconfirmed migration
- Northern limit of milkweed
- ? Potential monarch breeding habitat

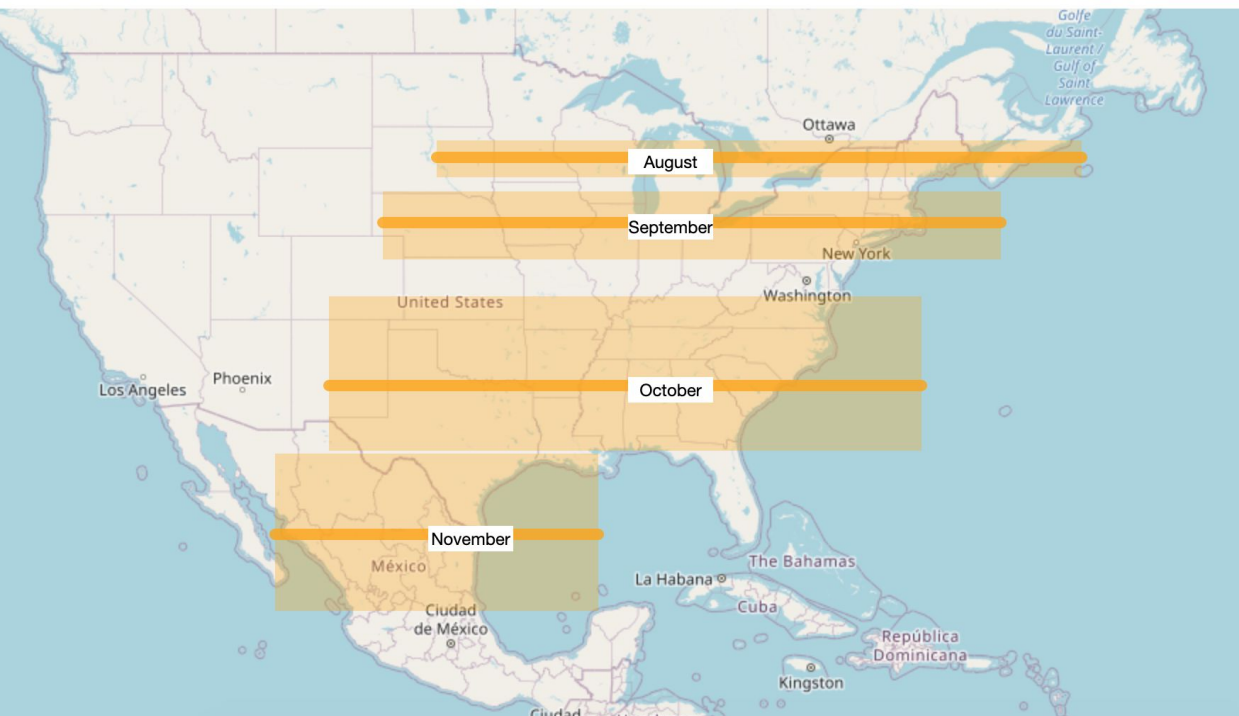
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Data Source

- Citizen scientists submit monarch observations to Journey North (<https://journeynorth.org/>)
 - Many types of observations are submitted
 - I focused on **Roosts** and **Peak Migration Events**
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Median Fall Migration Latitudes 2015-2020



My Analysis

- The map shows the median latitude for that month (solid orange line) and the quartiles Q1-Q3 inside the light orange areas
- 50% of the observations for each month fall within the shaded area

Reported Sightings: August, 2019



Animated Gif

- I created an animated gif showing the monarch migration for one season (Fall 2019)
 - Available online [here](#)
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August 2020



Interactive Map

- I created an interactive maps showing reported migration events for a few months of 2020
- Available here:
 - [August 2020](#)
 - [September 2020](#)

Limitations

- All of the observations are submitted by volunteers, and thus prone to errors
 - This was not a longitudinal study, so it was not possible to compare year to year - observations submitted over time have increased, but likely due to popularity of Journey North increasing, not monarch butterfly population increase
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