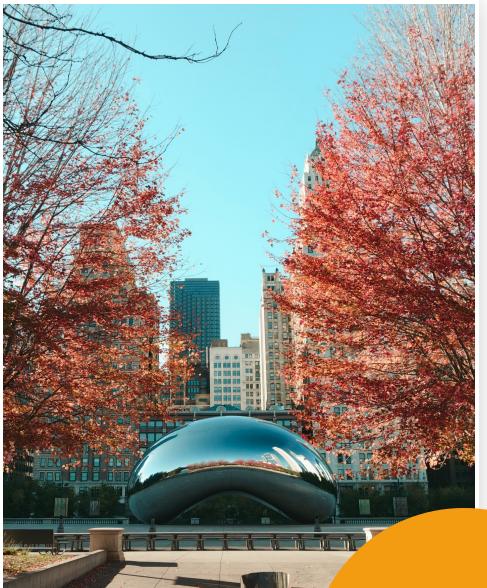


Decoding Joliet, IL's Weather Puzzle

Predicting Conditions for 2024

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Table of Contents



- 1 Introduction
- 2 Data Exploration
- 3 Model Building
- 4 Conclusion and Recommendation

INTRODUCTION

We will explore the weather prediction process for Joliet, IL in 2024. Join us for an exciting glimpse into weather prediction. Discover insights from our analysis and real-world applications of accurate forecasting. Experience the importance of weather predictions in your daily life. Don't miss out!

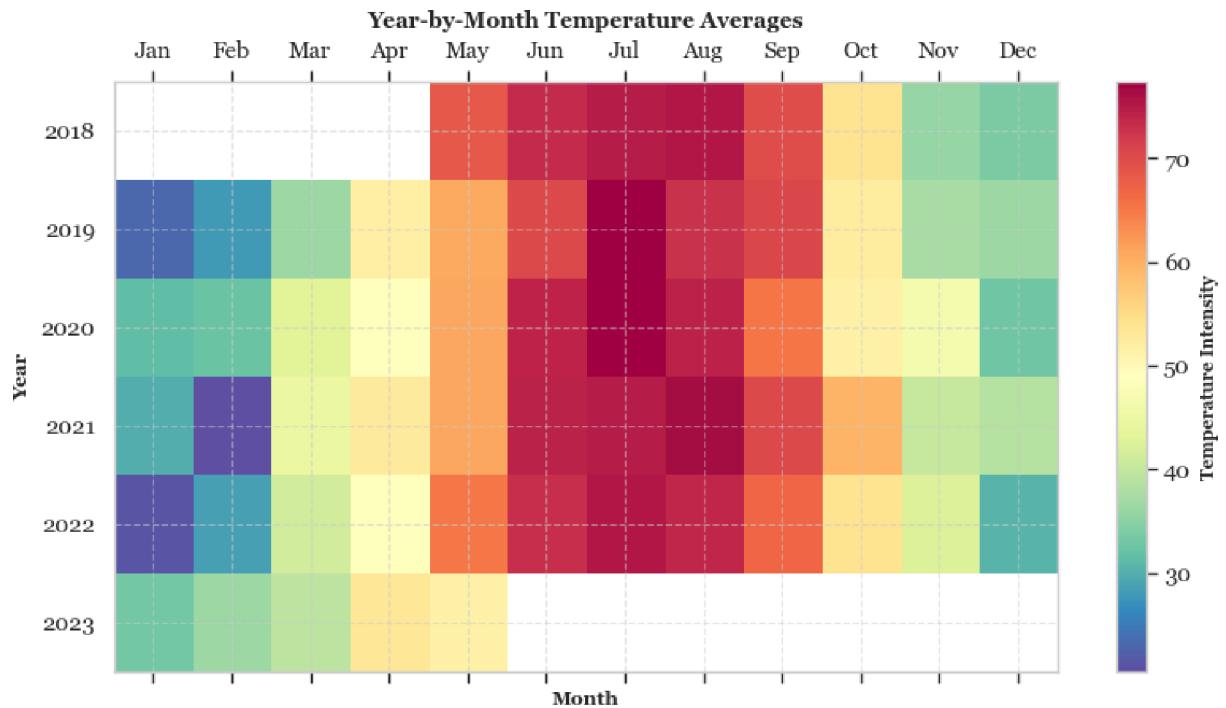
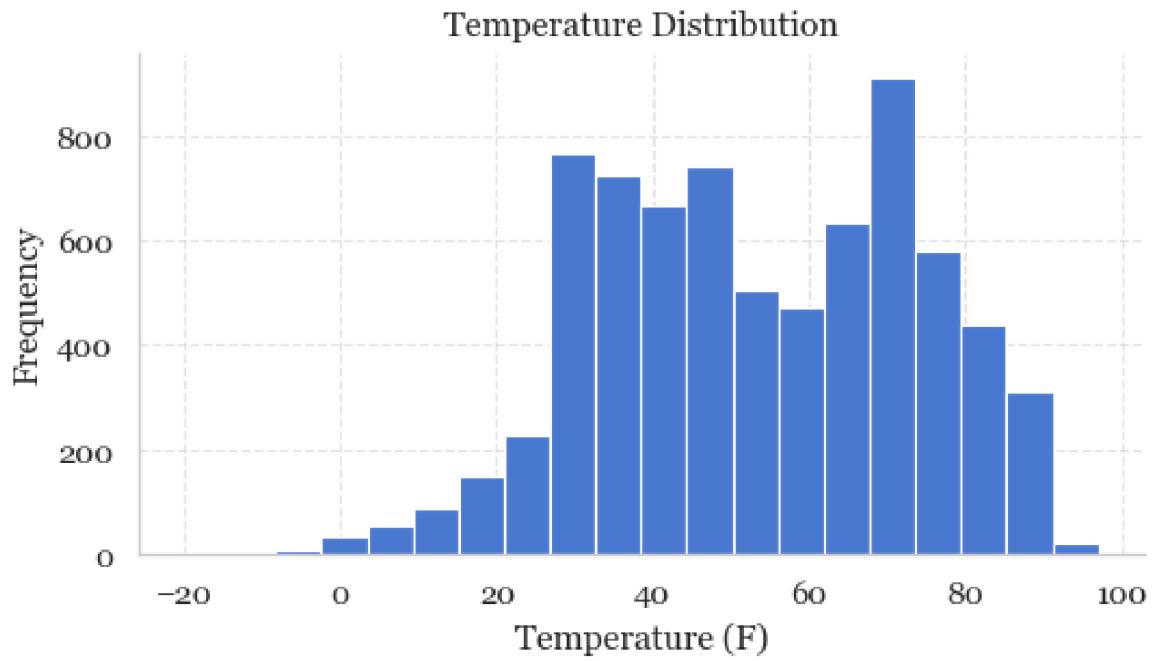


DATA EXPLORATION

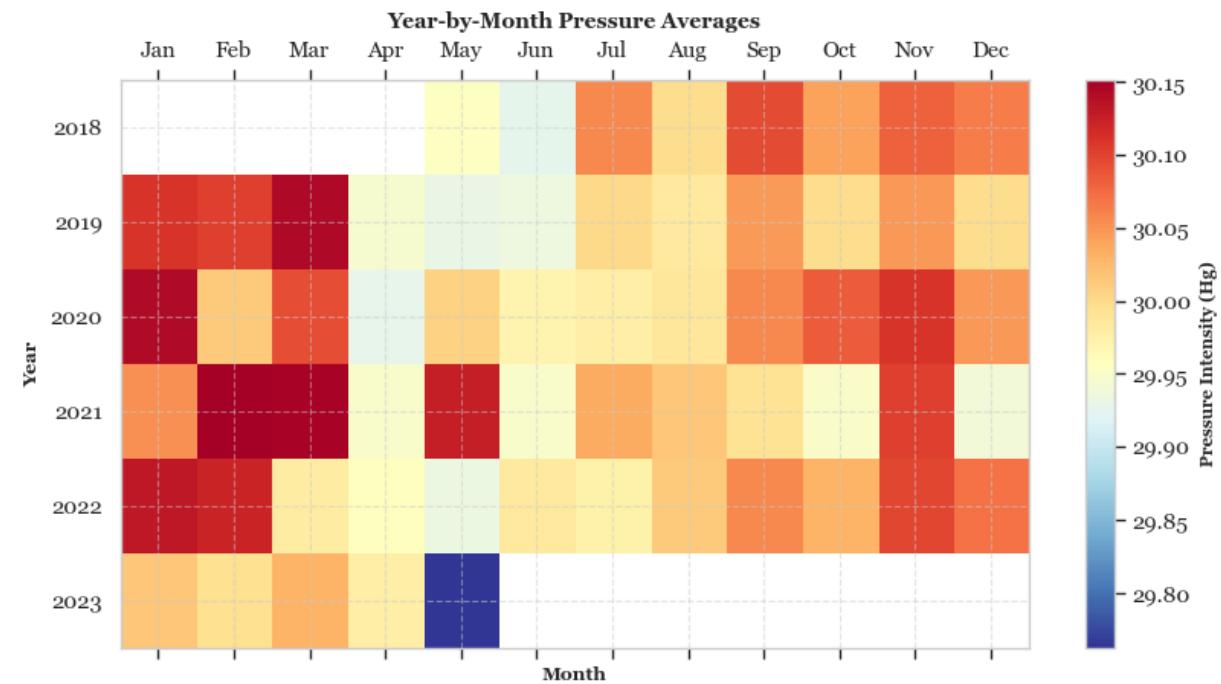
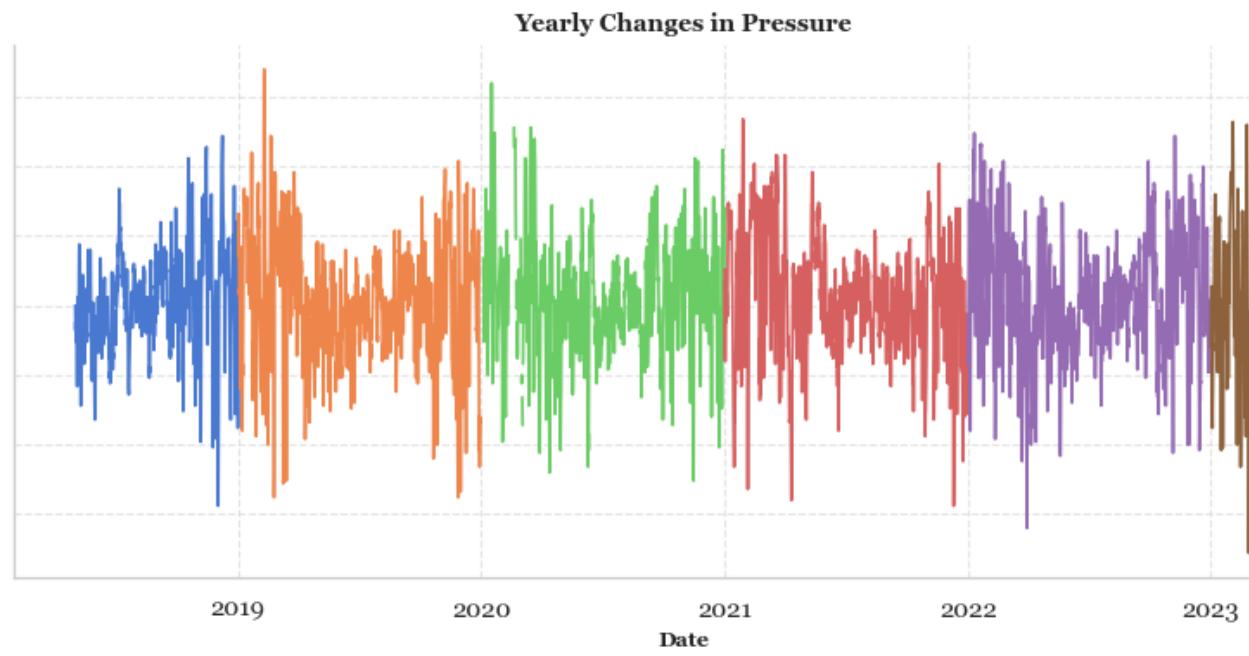
Our dataset of 7324 rows and 27 columns holds valuable weather information, carefully cleaned and refined for accuracy. Discover the hidden insights and forecasts within this data, unveiling the future weather patterns of Joliet, IL.

Let's explore the captivating world of weather prediction together!





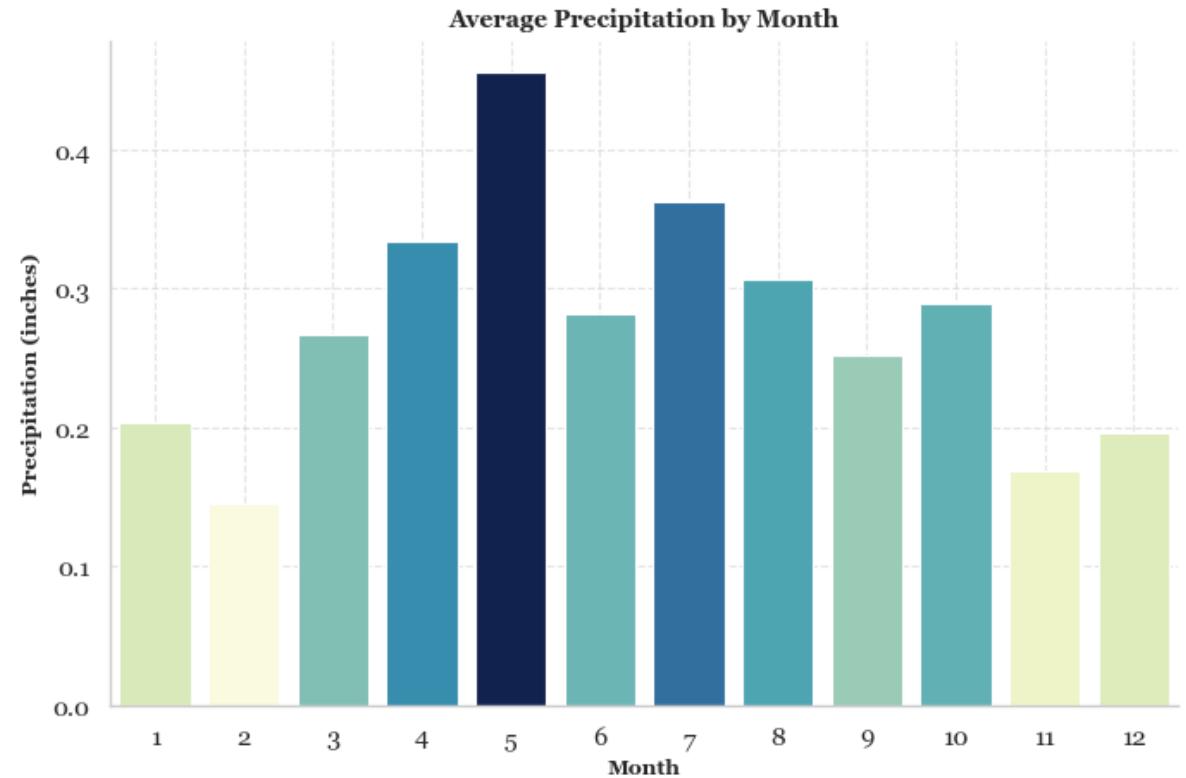
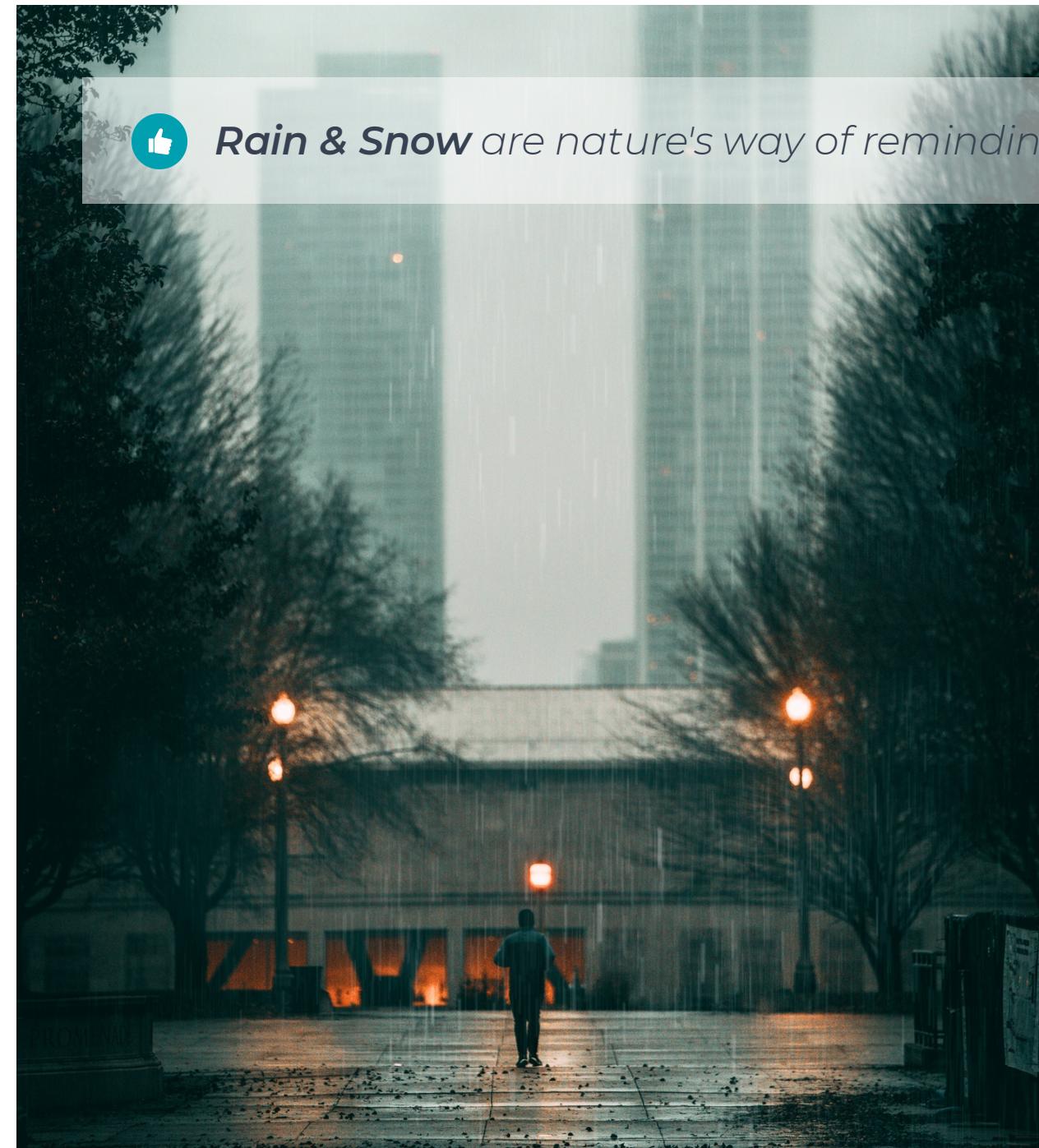
Temperature: a universal language spoken by the **Earth**.



Pressure: the unseen force that shapes our atmospheric world.



Rain & Snow are nature's way of reminding us that change is beautiful and necessary.



clear Skies

Light Drizzle / Overcast Sky
Light Drizzle / Scattered / Overcast Sky
In The Vicinity, Thunderstorms / Broken Sky
Rain / Scattered / Broken Sky

Light Snow / Overcast Sky
Drizzle / Overcast Sky
Strong Rain / Scattered / Broken Sky / Overcast Sky

Light Rain / Overcast Sky

Light Rain / Scattered / Overcast Sky

Mist / Broken Sky
Fog / Broken Sky
In The Vicinity, Vertical Visibility

Broken Sky

Scattered / Broken Sky / Overcast Sky
Brilliant / Scattered / Broken Sky / Overcast Sky

Mist / Overcast Sky

Light Snow / Scattered / Overcast Sky

Broken Sky / Overcast Sky

Mist / Broken Sky / Overcast Sky
Light Rain / Scattered / Broken Sky / Overcast Sky

Mist / Clear Skies

Strong Rain / Broken Sky / Overcast Sky
Light Rain / Broken Sky / Overcast Sky

Scattered / Broken Sky

Rain / Scattered / Broken Sky / Overcast Sky

Scattered / Overcast Sky

Rain / Overcast Sky
Light Rain / Scattered / Broken Sky
Light Drizzle / Scattered / Broken Sky / Overcast Sky

Light Snow / Broken Sky / Overcast Sky
Haze / Overcast Sky
Sun / Clear Skies
Rain / Broken Sky

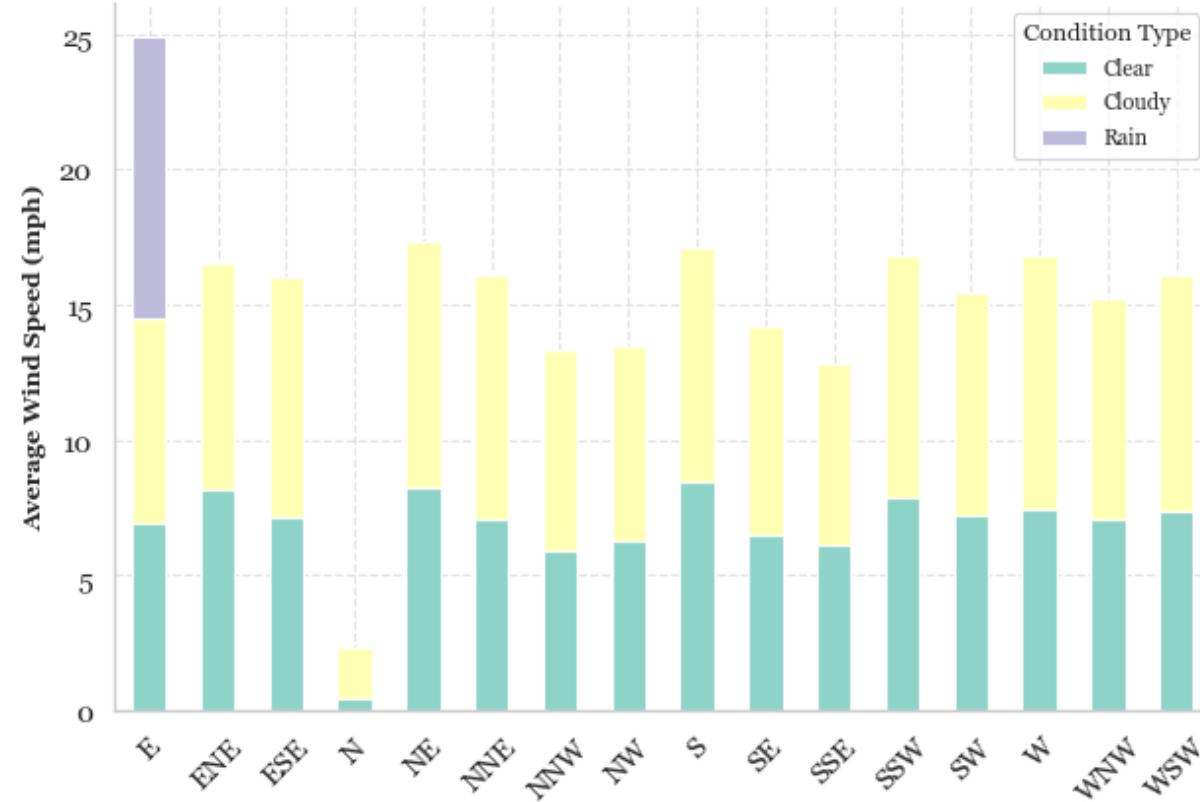
Fog / Overcast Sky
Drizzle / Broken Sky / Overcast Sky
Freezing, Fog / Overcast Sky

Fog / Vertical Visibility

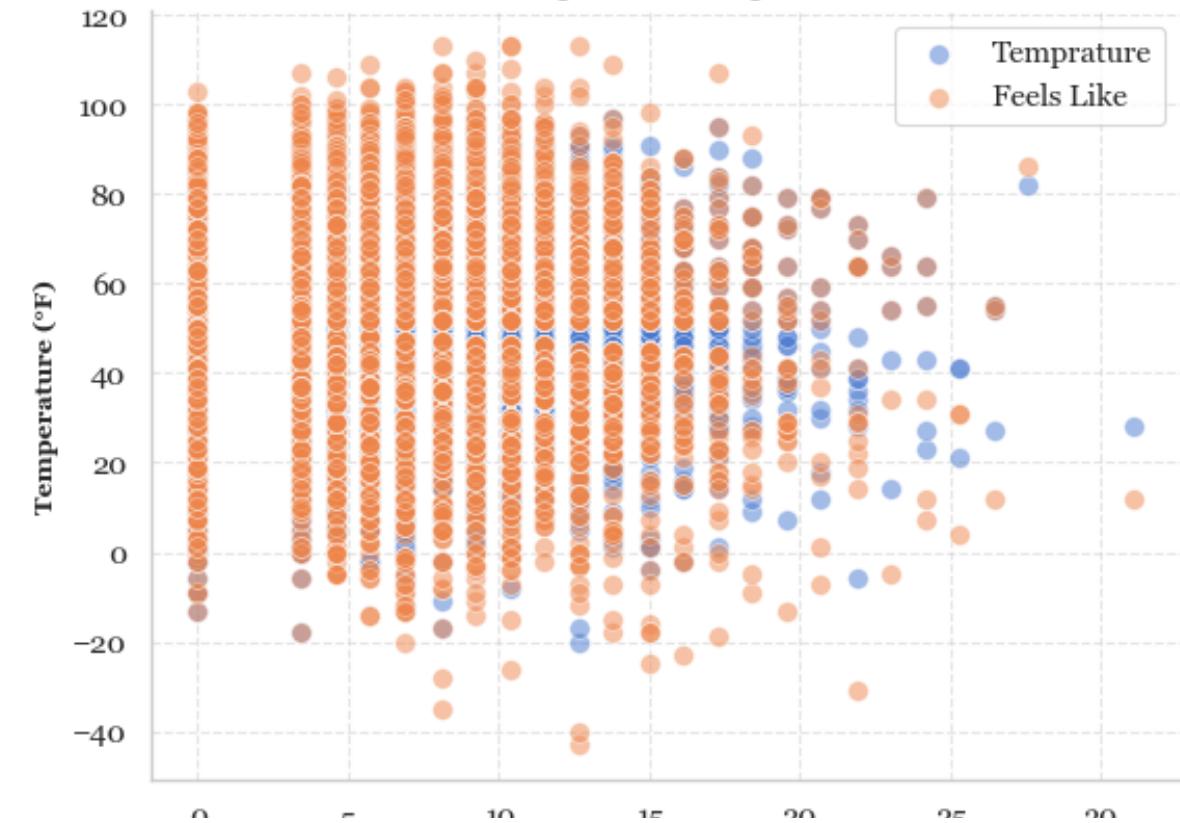


Clouds are nature's poetry, painting the sky with beauty and mystery.

Average Wind Speed by Wind Direction & Condition Type

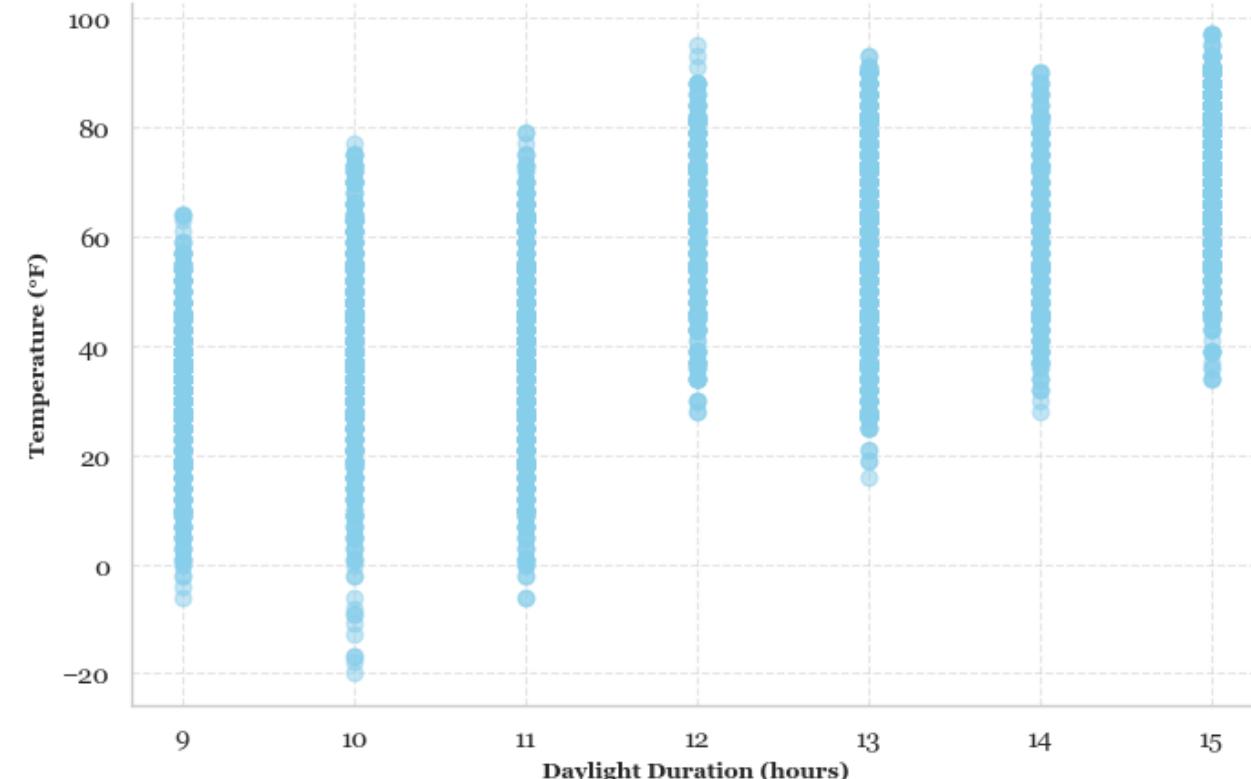


Wind Speed vs. Temperature

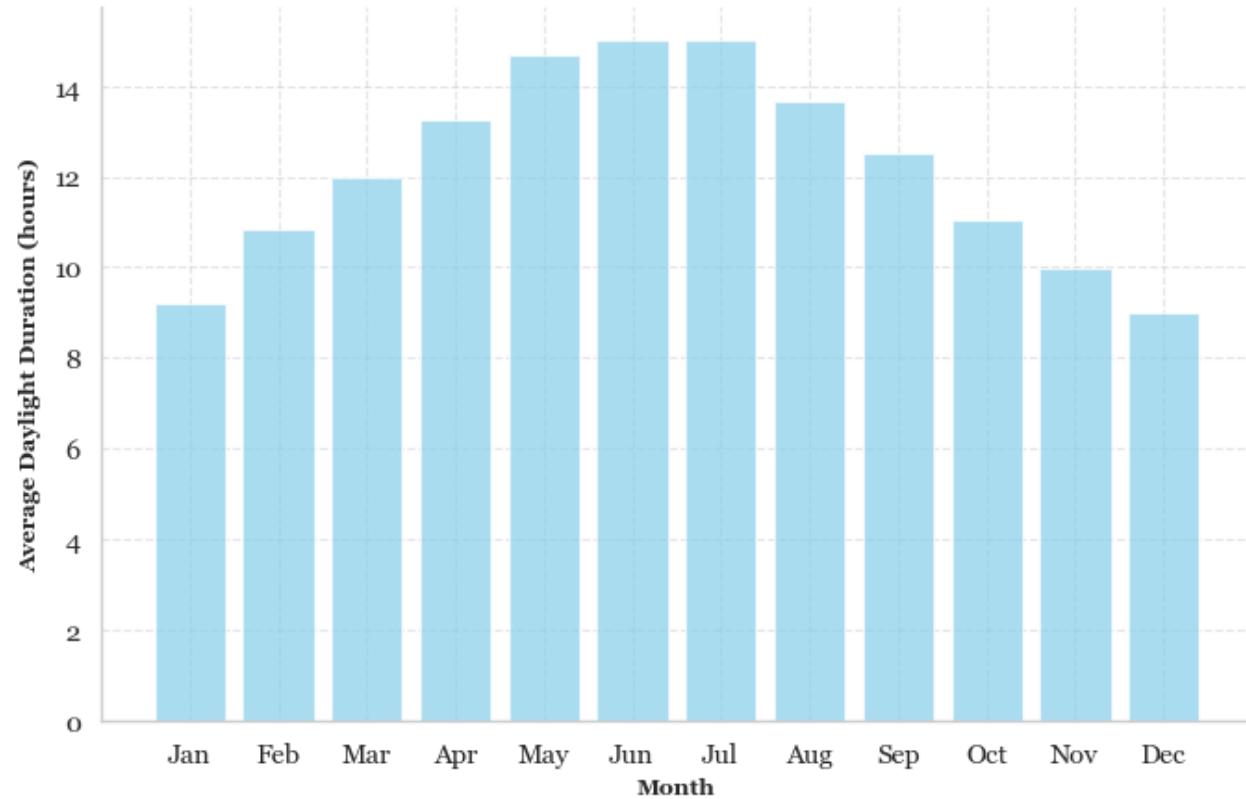


The **wind** is a powerful force, always in motion, reminding us that change is constant.

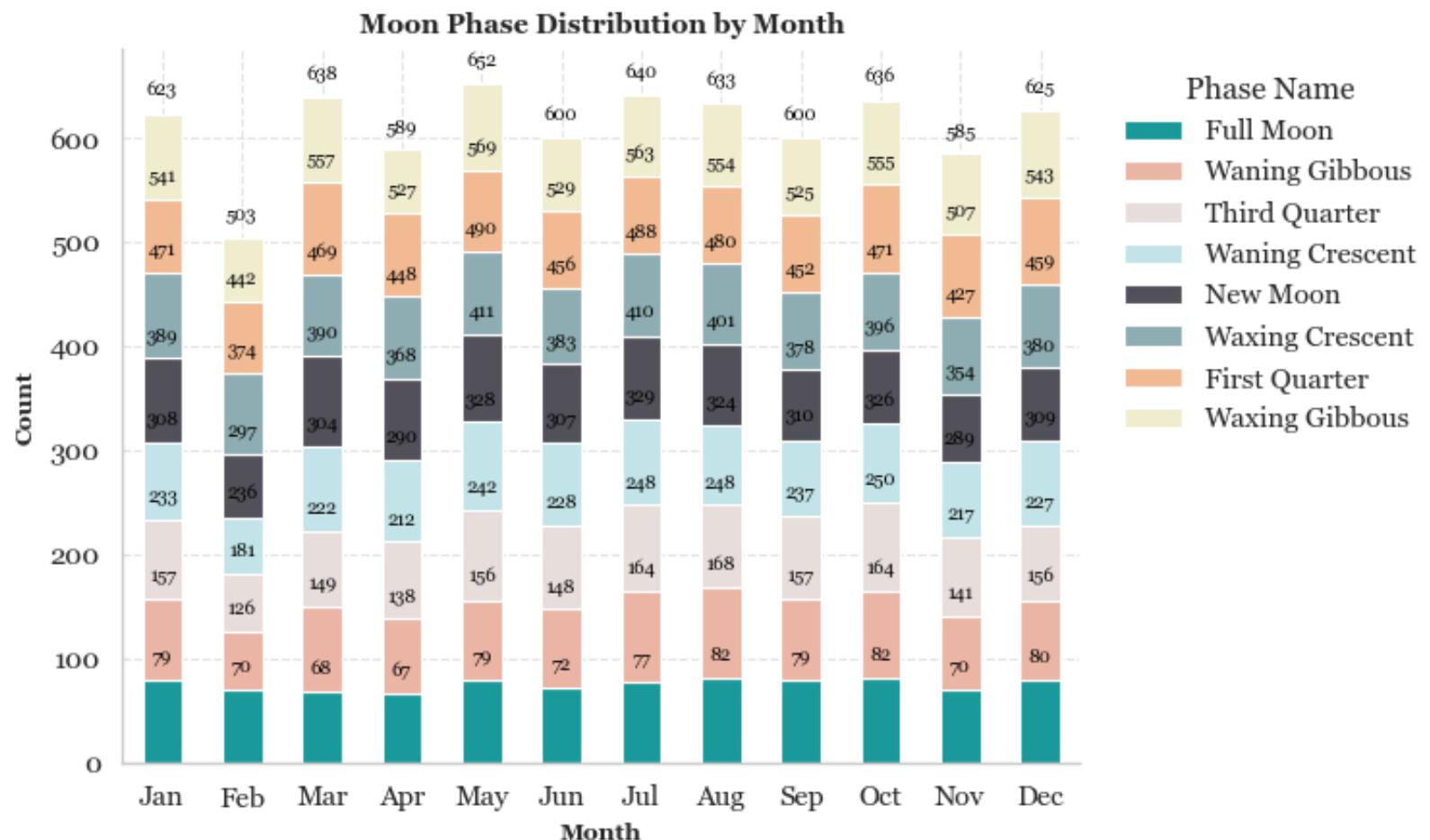
Daylight Duration vs. Temperature



Average Daylight Duration by Month



The **sun** is a daily reminder that we have the power to renew ourselves and start afresh.



The **moon** is a reminder that even in the darkest times, there is always a sliver of hope.

#1. Model Building

Data Preparation

Extracted input features (day and month) and target variable (temperature) from the dataset.

Data Splitting: Divided the data into training and testing sets.

Training set: All observations except the last 12 months.

Testing set: The last 12 months of observations.



#2. Model Building

ARIMA Model Specification

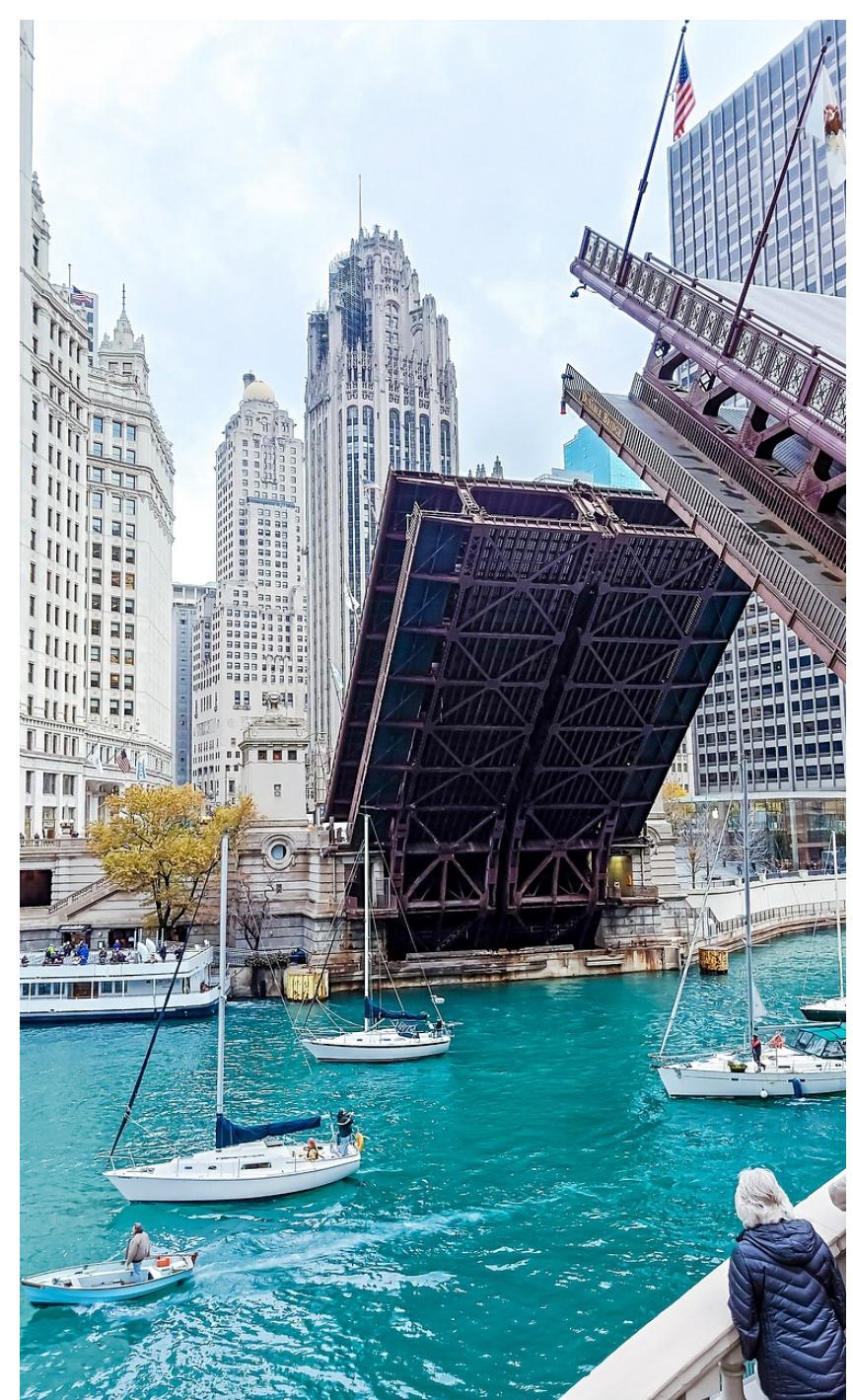
ARIMA (2, 1, 2) Model

AR (Autoregressive): Takes into account the two most recent temperature observations.

I (Differencing): Adjusts the temperature series once to achieve stationarity.

MA (Moving Average): Considers the two most recent prediction errors for forecasting temperature.





#3. Model Building

Train/Test/Evaluate

1. Model has been trained to predict temperature using the training data. (*model fit*)
 2. Trained model has been used to forecast temperature for the testing period (*generate predictions*)
- The model's temperature predictions, on average, deviate from the actual temperatures by approximately **7.05 (RMSE)** units.
-

Conclusion:

The simple ARIMA model used in this project has limitations in accurately predicting the weather for Joliet, IL in 2024. Further enhancements and refinements are necessary to improve the model's performance.



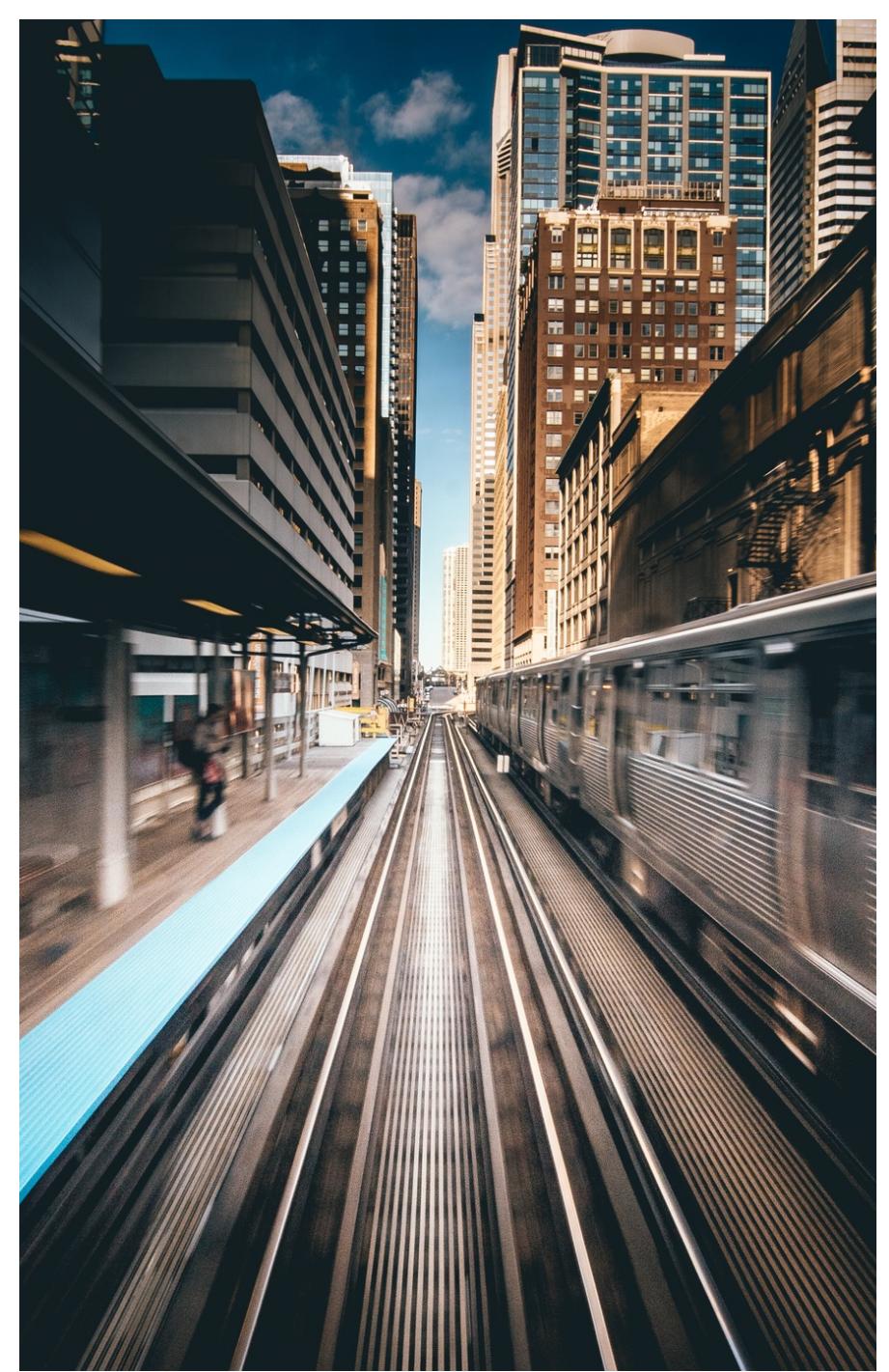
Recommendations:

Explore advanced machine learning techniques for time series forecasting.

Incorporate additional variables like humidity, wind speed, and neighboring region data.

Continuously refine and expand the model for more accurate predictions.





Empowering Weather Prediction.

Thanks, Earthcam!