

# STAT 386, Fall 2023

## Final Project Proposal

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### 1. Dataset

Our dataset will be primarily pulled from the National Weather Service using an API to get forecast data for temperature, wind speed, precipitation, etc. The API will have us input a coordinate(lat, long) and return the forecast for that specific location. The forecast will include graphics and summaries. The other data set we will use is on open-meteo which also has an API. open-meteo will allow us to access all historical weather data for any lat, long we will want to analyze.

### 2. Proposed Analysis

We plan on analyzing forecasted and historical weather data together for specific cities in the USA(given as an argument in a python function. Ex. SLC or NYC, OR as a lat, long coordinate). The analysis will include graphical representations of the forecasted and historical data together. Taylor will primarily work on data collection/API calls/cleanup and Cameron will primarily work on analysis/visualization.

### 3. In what way would Python functions, organized in a package, aid in the analysis of the selected dataset?

Our python package would aid in analysis because it will be able to collect data automatically based on specified cities(or lat long) and give the current weather forecast and previous historical weather data in a graphical, user-friendly representation. The package will also give stats about the weather forecast compared to previous years and whether or not the forecast is abnormal.

### 4. What challenges do you foresee in completing this analysis? How do you intend to address these challenges?

Some challenges would be organizing all of the data into a nice table, and finding good ways to visualize the data consistently. We intend to address this by using the tools we learned in previous labs to make the data nice and manageable. There might be data challenges especially if there is incomplete data where we would have to handle such incomplete data.

### 5. In what way(s) would your analysis be of interest to the other students in the class?

This analysis will be of interest to other students because weather forecast data and historical weather data are not easily gathered and visualized across the country in one place. You have to go to multiple places to try and piece historical weather data and current forecast data together. It may also pique some student's interest in meteorology + statistics.

# Bibliography

United States. (1999) National Weather Service. United States. [Web Archive] Retrieved from the Library of Congress, <https://www.loc.gov/item/lcwaN0015050/>.

Open-meteo.com requested that we cite all of the sources below when we cite them

Zippenfenig, P. (2023). Open-Meteo.com Weather API [Computer software]. Zenodo. <https://doi.org/10.5281/ZENODO.7970649>

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Schimanke S., Ridal M., Le Moigne P., Berggren L., Undén P., Randriamampianina R., Andrea U., Bazile E., Bertelsen A., Brousseau P., Dahlgren P., Edvinsson L., El Said A., Glinton M., Hopsch S., Isaksson L., Mladek R., Olsson E., Verrelle A., Wang Z.Q. (2021). CERRA sub-daily regional reanalysis data for Europe on single levels from 1984 to present [Data set]. ECMWF. <https://doi.org/10.24381/CDS.622A565A>

API's:

Historical data: <https://open-meteo.com/en/docs/historical-weather-api>

Current forecast: <https://www.weather.gov/documentation/services-web-api#/>