

Department Of Aerospace Engineering  
Indian Institute Of Technology Madras



## **CS5830: Big Data Laboratory**

### Assignment 3 Report

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# 1 Aim

This assignment aims to fetch the data from the [NCEI](#) website and compute monthly averages of the climatic parameters and plot the data.

## 2 Procedure/Steps

The steps while executing this assignment are as follows:-

1. The first step is a pipeline to fetch the data from the website and store it in the archive. It is important to note that the data available is from 1901 to 2024 without more than 80 parameters and hourly readings with each year having details from anywhere between 5-6 stations to 10000+ stations. Hence, only the years 1901, 1911, ..., till 2001, and 2002 to 2024 were considered.
2. The next step is to arrange the data location-wise with the parameters in an array. This data was again stored in CSV files.
3. The third step is to compute the monthly averages for each month and parameters for each location. This data was also stored in CSV files.
4. The next step is to plot the data in the form of heatmaps.
5. Finally, an animated video is to be made which is optional.

## 3 Parameters

The parameters plotted using the available data are as follows:-

1. Hourly Altimeter Setting
2. Hourly Dew Point Temperature
3. Hourly Dry Bulb Temperature
4. Hourly Relative Humidity
5. Hourly Sea Level Pressure
6. Hourly Station Pressure
7. Hourly Visibility
8. Hourly Wet Bulb Temperature
9. Hourly Wind Direction
10. Hourly Wind Speed

## 4 Plots

The plots of the monthly averages of the 10 parameters for January are plotted as follows:-

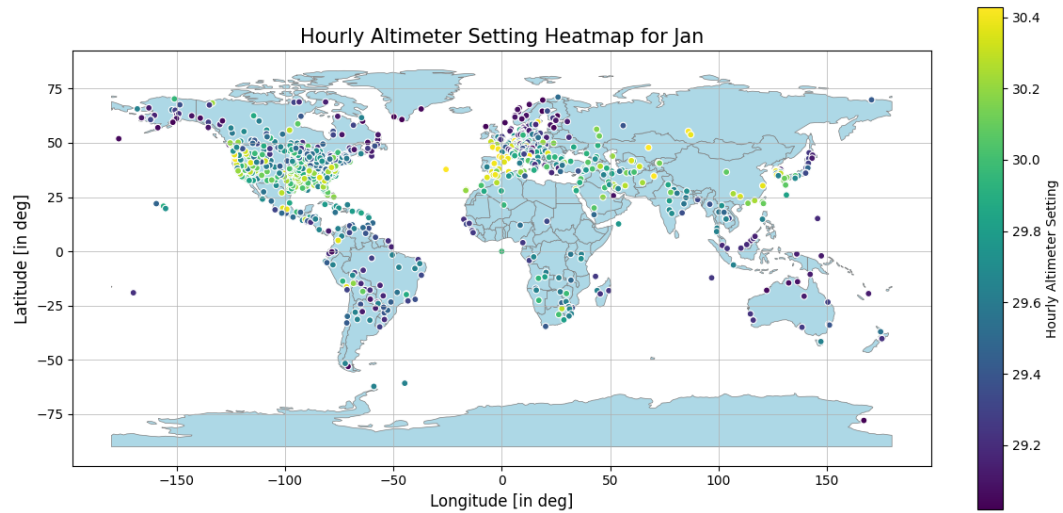


Figure 1: Hourly Altimeter Setting Heatmap

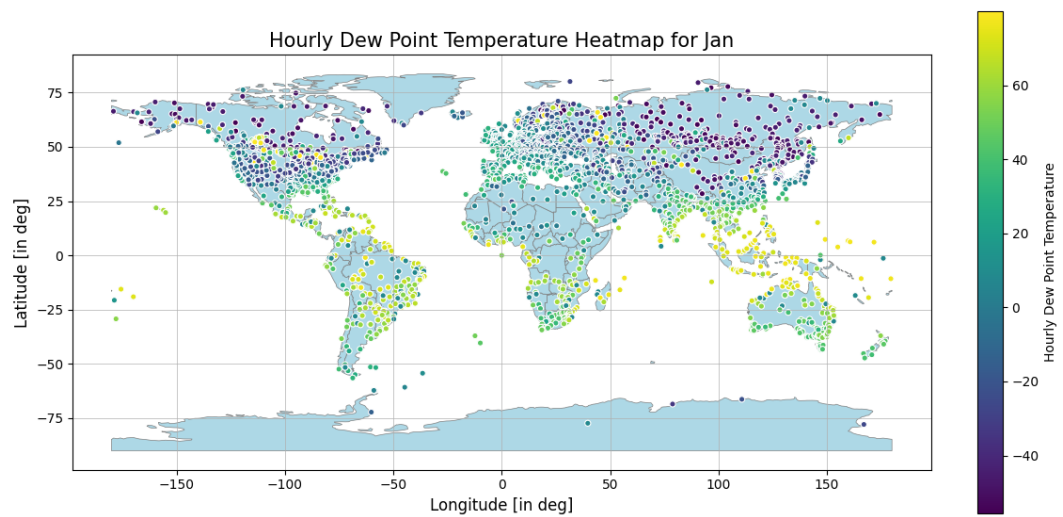


Figure 2: Hourly Dew Point Temperature Heatmap

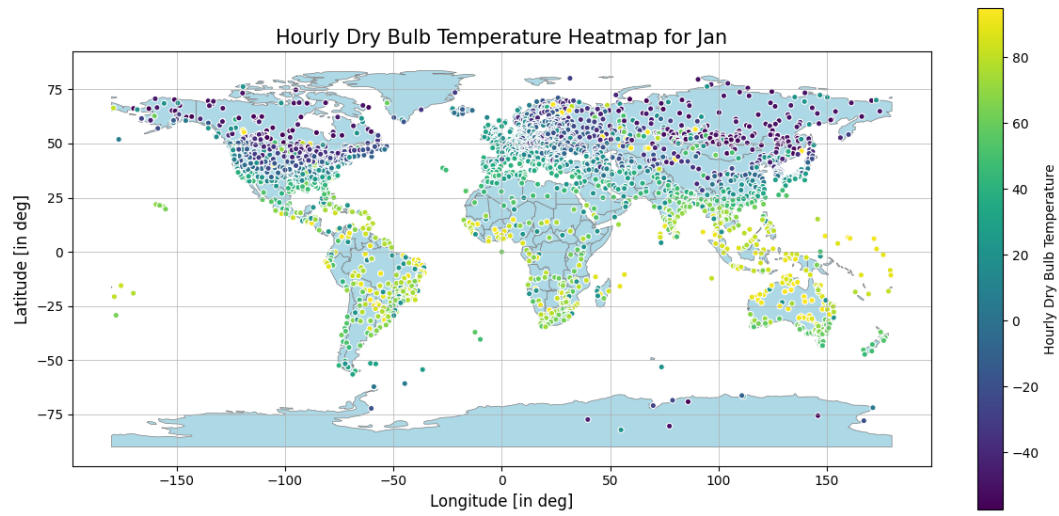


Figure 3: Hourly Dry Bulb Temperature Heatmap

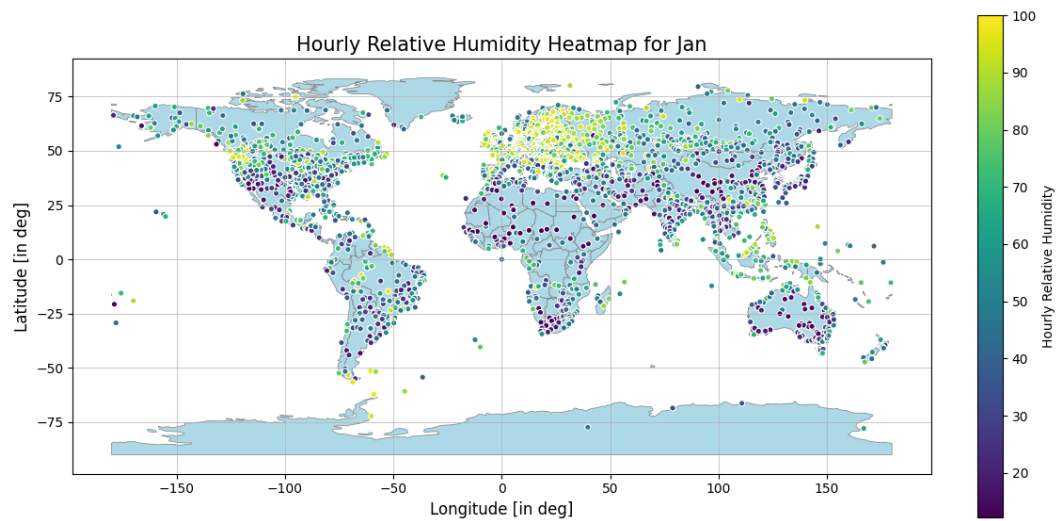


Figure 4: Hourly Relative Humidity Heatmap

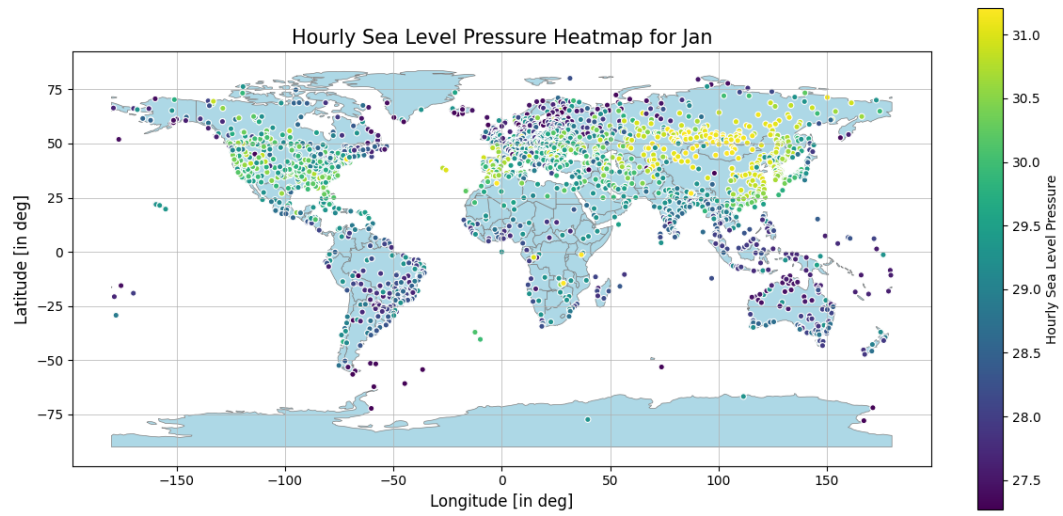


Figure 5: Hourly Sea Level Pressure Heatmap

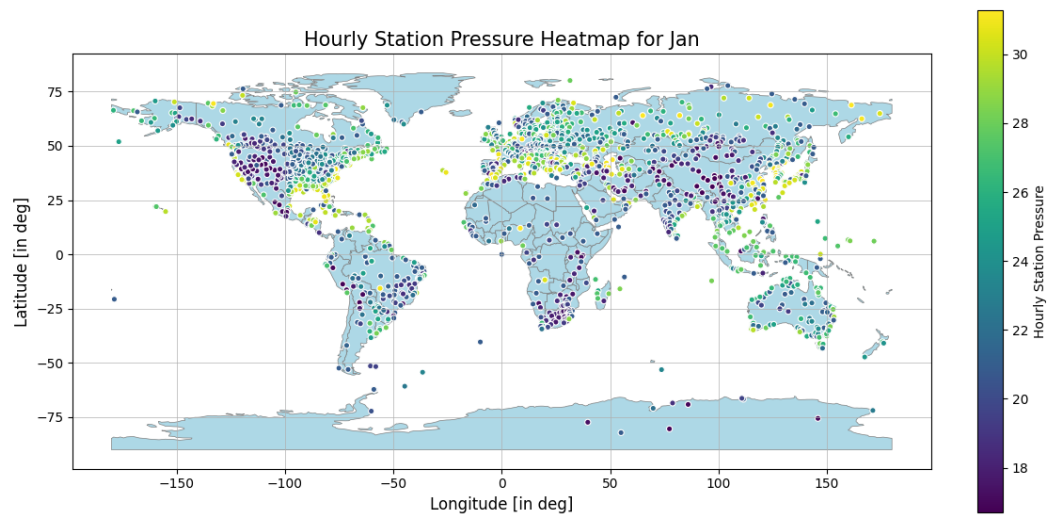


Figure 6: Hourly Station Pressure Heatmap

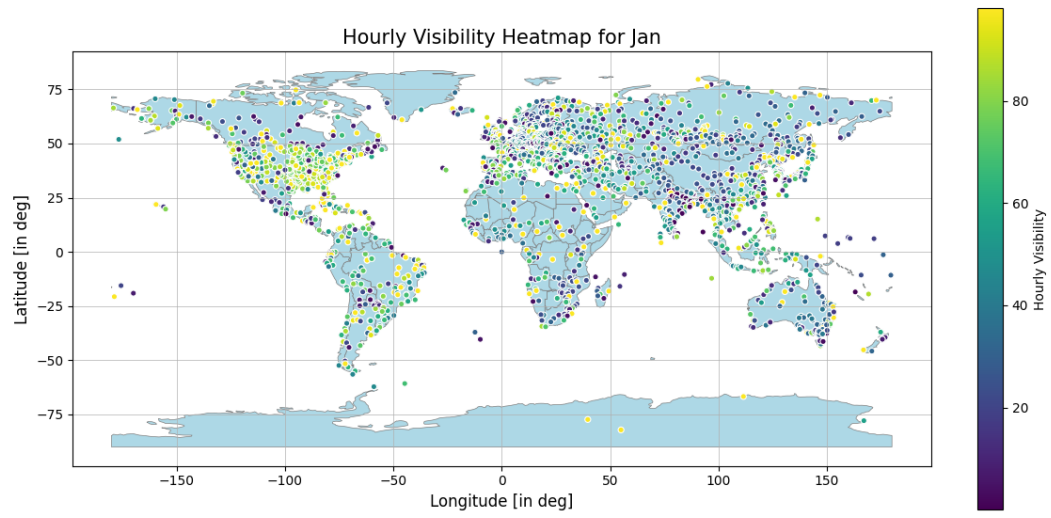


Figure 7: Hourly Visibility Heatmap

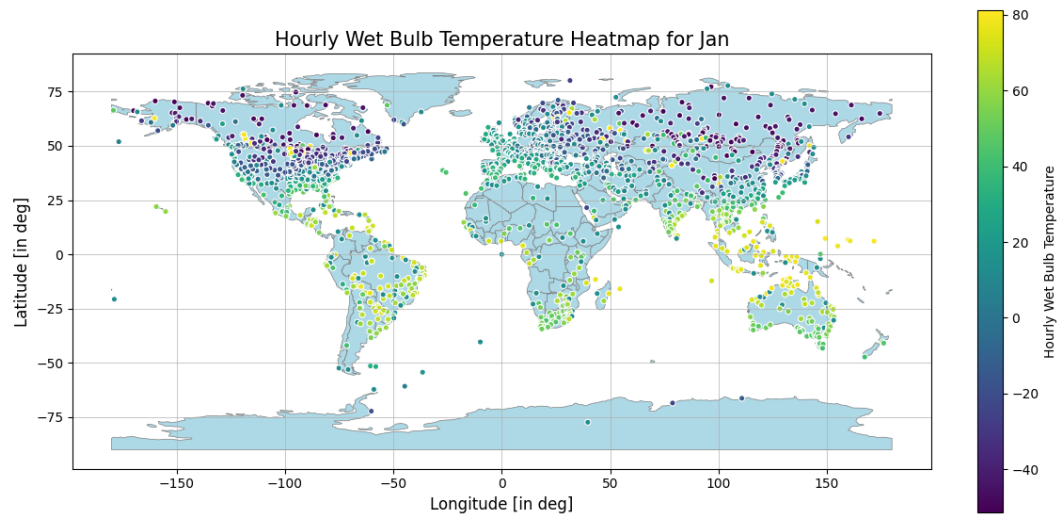


Figure 8: Hourly Wet Bulb Temperature Heatmap

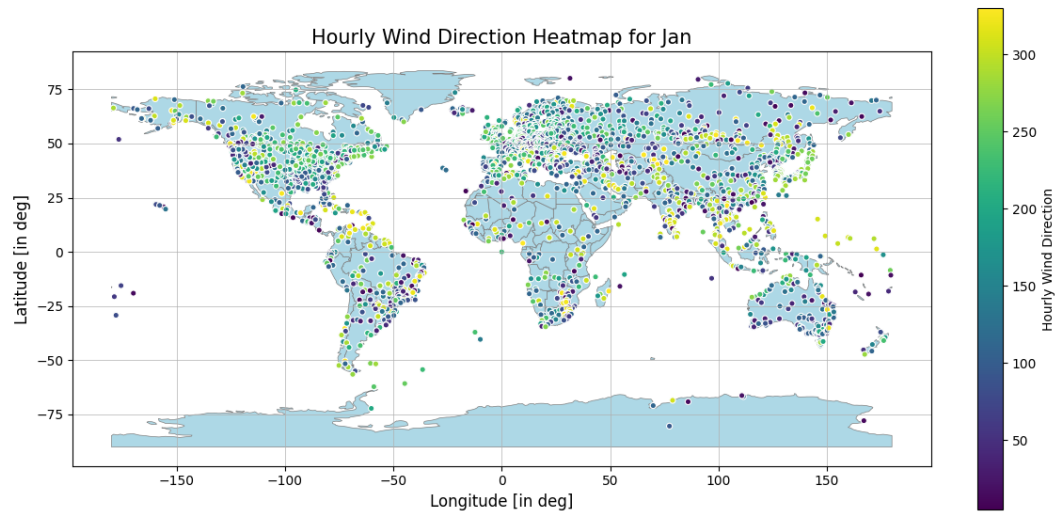


Figure 9: Hourly Wind Direction Heatmap

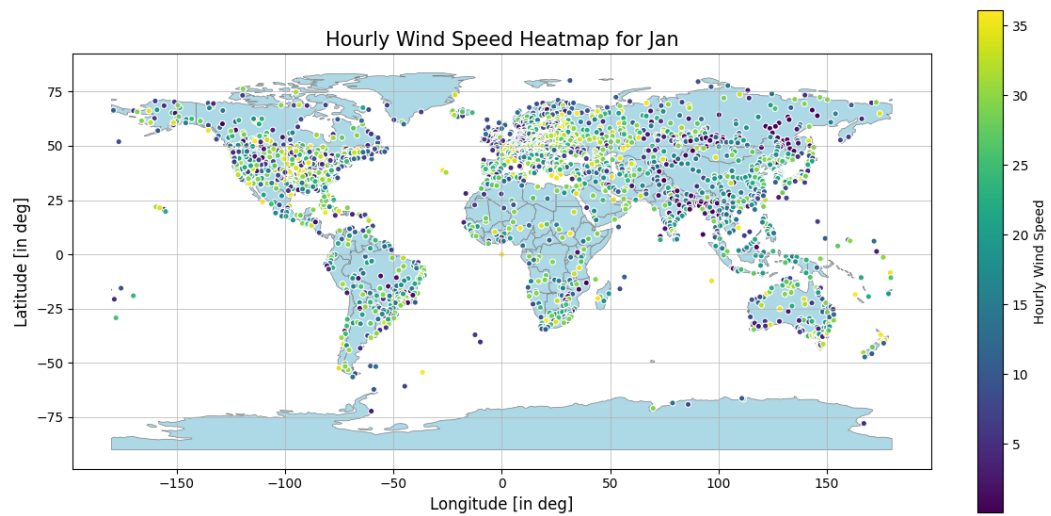


Figure 10: Hourly Wind Speed Heatmap

All the plots can be found [here](#) and all the animations made for all parameters can be found [here](#).