

# CLIMATE CHANGE

Team Data Vizards

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## OVERVIEW

[Climate Change](#) is the defining issue of our time and we are at a defining moment. From shifting weather patterns that threaten food production, to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global in scope and unprecedented in scale. Without drastic action today, adapting to these impacts in the future will be more difficult and costly.

[Global warming](#) is the ongoing rise of the average temperature of the Earth's climate system and has been demonstrated by direct temperature measurements and by measurements of various effects of the warming. It is a major aspect of climate change which has been negatively affected the time of the Industrial Revolution (1760 – 1840)



Yet to this day [conspiracy theorists](#) typically allege that, through worldwide acts of professional and criminal misconduct, the science behind global warming has been invented or distorted for ideological or financial reasons.

The aim of this data visualization is to [find climate change buried in millions of data points obtained from a verified source](#) and [debunk the claims of these conspiracy theorists!](#)

## PURPOSE

1. The Global Historical Climatology Network (GHCN) dataset is very cumbersome to parse and in no way user friendly. There are multiple files for each weather station for each day in the calendar that store the temperatures recorded for that day. Our first task was to represent this data in a user friendly manner.

This was done using donut charts as can be seen in the video. The donuts charts have 5 main elements of information. The

- Date
- Location of the weather station
- Maximum temperature recorded that day

- Minimum temperature recorded that day
- The average temperature of the month

All this information is incorporated into two cute coloured circles and displayed on the page!

- 2. We then look at the average monthly temperature for different cities using a sliding bar chart!**
3. Next is to debunk the claims of the climate change conspirators done using a spatial visualization! Here we use a map to display records of maximum and minimum temperature that were broken around the world from after the Industrial revolution (1980) till present! This is done on the map.

The map has a slider that moves from 1970 to present. A blue dot appears at a weather station when the recorded minimum temperature till that day is broken. A red dot appears at the spot when the maximum temperature recorded till that day is broken!

4. Finally we want to analyse the spatial visualization using line graphs showing the records of minimum and maximum temperature broken as a function of time. Three line graphs show the rate of records broken per week, month and year.

***The fourth graph shows the total records broken till date.*** [This is the most important graph, relevant to our analysis]

A mantra that we used throughout our project is,

“

**Color is a power which directly influences the soul.**

-Wassily Kandinsky

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## **DATASET USED**

The Global Historical Climatology Network (GHCN) is an integrated database of climate summaries from land surface stations across the globe. GHCN-Daily contains records from over 100,000 stations in 180 countries and territories.

Main website:

<https://www.ncdc.noaa.gov/data-access/land-based-station-data/land-based-datasets/global-historical-climatology-network-ghcn>

## **VIDEO LINK :**

<https://drive.google.com/open?id=1oZiZM2-pmVSImnCyHUIFtxbILQGBuxjl>

## **ANALYSIS**

This data visualization shows that the winters are progressively getting colder and the summers are getting hotter as temperature records are being broken around the world multiple times in a year. ***This proves that climate change is a reality!***

In layman's terms the all-time lows are getting lower and the all-time highs are getting higher respectively at different places across the globe across the years since the Industrial Revolution. This trend proves that the climate is in trouble!

When someone says they don't believe  
in global warming



The fourth graph proves that the number of records being broken shows no sign of gaining stability. It is a graph that is constantly on the rise and shows no sign of slowing down. If this continues our planet is in grave danger. We must recognise the problem and generate feasible solutions.

“

I hope we all understand the need to move from solemn declarations to concrete actions and initiatives that are commensurate to the level of present and future challenges

-Bocchit Edmond, the minister for foreign affairs of Haiti

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## **VERSATILITY OF THE DATA VISUALIZATION**

*Further this spatial visualization of the map can extend to any data where the data is related to a location on the map!* It can basically be used as a template for

creating fast and beautiful maps showing events over time. It is useful for any data with timestamps and locations, such as website traffic or financial transactions, the criminal records of jails around the world or even the usage of the internet at different places around the globe. ***When did these values reach and break all time lows and highs at a particular location on the map? This can be shown using our spatial visualization!***

In layman's terms, taking the example of web traffic, when did these numbers reach all-time lows and highs? A blue dot could show an all time low on mobiles and yellow dot could show an all time low on desktops and a darker shade of blue could show an all-time high on the mobile phones and a darker shade of yellow could show an all time high on desktops. The trends can then be analysed using the line graphs!

In this manner our visualization is extremely versatile and useful in analysing trends.

The only requirements from the data are columns for:

- Latitude: the latitude of the event.
- Longitude: the longitude of the event.
- Timestamp: the start time of the event.