

This project embarked on an exploration of data visualisation and analysis, utilising a dataset simulating the RCP8.5 scenario. Representing daily atmospheric variables for Manchester, the dataset includes crucial parameters such as surface temperature, wind, and water vapour levels, under the assumption of a significant increase in carbon dioxide concentrations and consequent rise in average atmospheric temperatures.

The core of my analysis was to understand the temporal trends in temperature. Initial visualisations and analyses revealed a strong correlation between temperature and solar flux, corroborating existing scientific understanding. By segmenting the dataset into two distinct eras—representing current and future climates over a 75-year period—I demonstrated notable shifts in temperature distributions. Specifically, future climate projections indicate an increase in both the average temperature and variability, suggesting a rise in extreme temperature events. This trend was particularly pronounced during the summer months, highlighting the intensified impact of warming on this season. One of the primary challenges encountered was identifying effective visualisation techniques to articulate the differences between the current and future climate scenarios. Employing histograms to depict temperature distribution shifts proved insightful, yet the quest for more impactful visual representations was a constant theme throughout the project. A significant component of this study was the examination of heatwave trends, adhering to the UK Met Office's definition. The analysis unveiled a clear upward trajectory in heatwave occurrences, reinforcing concerns about the escalating impacts of climate change on extreme weather phenomena.

This project enabled a deep dive into the implications of rising temperatures, particularly focusing on the general trends in atmospheric variables and the specific increase in temperatures and heatwave occurrences. While the study was geographically limited to Manchester, the methodologies and insights gained hold potential for broader regional analyses, offering a window into the spatial variability of climate change impacts.

The process underscored the importance of diverse visualisation and analysis techniques in elucidating complex climate data. While the project concentrated on temperature-related variables, acknowledging the omission of detailed preprocessing for other variables, future endeavours will aim to incorporate a more comprehensive analysis that encompasses a wider array of atmospheric factors.

Through this project, I have gained valuable insights into the dynamics of atmospheric variables in response to temperature increases and developed a deeper understanding of heatwave analysis. The experience has also enhanced my ability to apply various visualisation and analytical methods, laying a foundation for more intricate climate data exploration in future projects.