

Cherry Blossoms in the Climate Crisis

It is no secret that climate change is altering our world and its ecosystems, and we are already starting to see its effects: extreme weather events are becoming more frequent, temperatures are fluctuating, sea levels are rising, and more. The cherry blossom trees, which have long been a symbol of springtime and whose blooming is annual tradition around the globe, are no exception. The data shows that, for the past few decades, the cherry blossom trees are generally blooming earlier than before, which is largely attributed to growing-degree days where more heat is being absorbed by plants in fewer days. My own analysis confirms that the cherry blossoms will bloom earlier this year and they will continue doing so into the future. These findings are significant because they reveal further effects of climate change and support calls for action to address it before the dangers we face grow beyond just early plant blooms.

With data from the United States National Phenology Network, I created a linear regression model using the year with the latitude, longitude, and altitude of various cherry blossom locations in the United States going back to 2009. This limited the training data to years known to be affected by climate change, and this model was applied to the cities of interest for the next ten years (Kyoto, Liestal, Washington D.C., and Vancouver). The mixture of latitude, longitude, and altitude quantify the geographical location of each city containing cherry blossoms. This approach is unique because it emphasizes the permanent location of the cherry blossoms as opposed to climate factors like rainfall and temperature which can vary wildly each year, especially with the increasing effects of climate change. Given the multitude of ways to implement climate data, utilizing just the location serves to wrap them into one because climate trends will be reflected in trends in that location more than they will in individual factors, making this an optimal, general set of predictor variables. The year adds the temporal component

that will consider the progression of climate change's effects and the shorter growth periods of cherry trees.

Growing-degree days is the underlying mechanism through which plant growth is measured and often predicted, as in this analysis. It is an equation based off the total accumulation of heat a plant receives: the more heat a plant receives, the fewer growing-degree days there will be until its bloom because each day provides more heat to the plant. This long-used measurement is key to understanding how climate change can affect our world as plants will have shorter growing cycles as the world experiences more heat, which could throw long-standing natural cycles in animals and entire ecosystems off-balance. This case with the cherry blossoms is vital as a case for future research into climate change's effects on plant cycles and their subsequent effects on natural cycles.

With this evidence further showing how climate change is affecting our world, it is vital that we learn from studies such as this to address the climate crisis before it is too late and the damage is irreparable, devastating ecosystems around the globe and evolving into a climate cataclysm.