

While attention has been focused on the Coronavirus, another natural disaster has also had a significant impact in recent years. This kind of natural disaster is very common both in the United States and in my own country, China, and it is called wildfires.

The effects of wildfires in Hawaii

by Yurun Jiang

Wildfires may be unfamiliar to young people like me, because having lived in the city for a long time, some of the effects of wildfires seem to have no impact on people in the inner city. But the fact is that wildfires actually influence human life in a big way no matter where you are. It is currently causing severe global warming, which affects every part of the planet. It is urgent to study wildfire behavior.



(Figure 1: The effects of wildfires in Hawaii, Hawaii Wildfire Management Organization)

The process and direction of analysis

This time Xi and I studied the effects of climate change on wildfire behavior in Hawaii to help anticipate future wildfire hazard for local military bases. Xi and I conducted data analysis through Excel and Behave Plus. Different from our hypothesis in the analysis process, we found that it was more difficult to analyze

precipitation compared with temperature, wind speed and relative humidity. Due to many factors in the analysis, I only interpreted two climate variables for comparison. Because the humidity and wind speed tend to be the same in the future as in the past, they do not change much from month to month in different years. So here I'm just analyzing temperature and precipitation.

I visualized monthly trends of temperature and humidity over different years under two model conditions (RCP 4.5 and RCP 8.5).

Representative Concentration Pathway (RCP) is a “greenhouse gas concentration trajectory” (“Representative Concentration Pathway,” 2021). RCP 4.5 is an intermediate scenario. RCP8.5 is the basis for a “worst-case climate change scenario” (“Representative Concentration Pathway,” 2021).

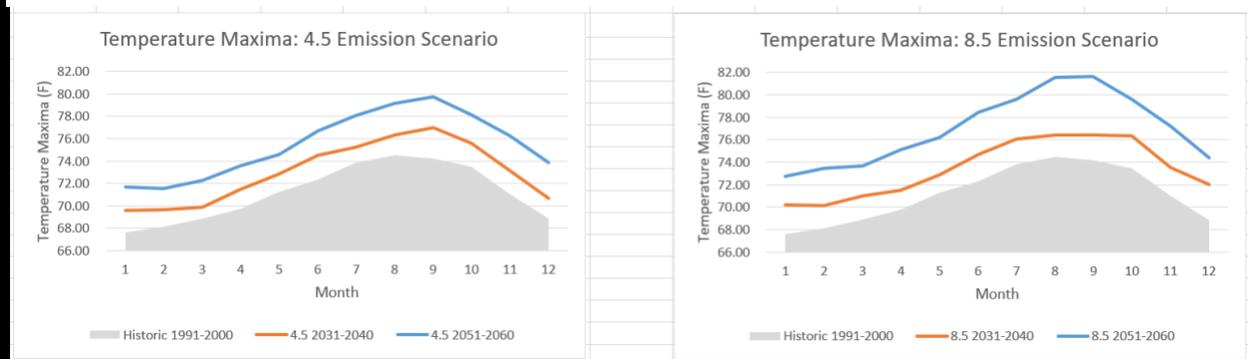


Figure 2: Temperature Maxima in RCP 4.5 Emission Scenario and RCP 8.5 Emission Scenario.

From Figure 2, we can see projected increases in temperature rises across all months of the year. We observe little change in temperature trend throughout the year. The temperature increase in August and September is greater than the monthly average increase. Under the RCP4.5 scenario, the average temperature variation in 2031-2040 and 2051-2060 is +1.44 degrees and +4.02 degrees, while under the RCP8.5 scenario, the temperature variation in two-year period is +2.30 degrees and +5.41 degrees.

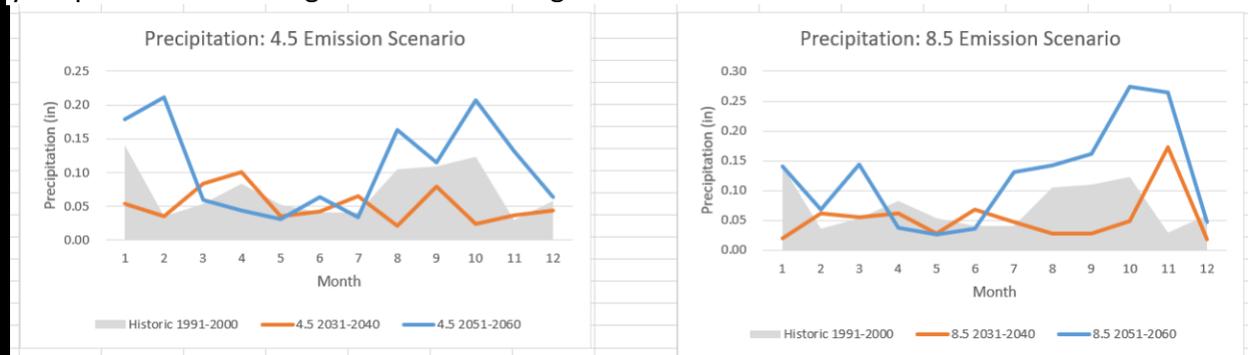


Figure 3: Precipitation in RCP 4.5 Emission Scenario and RCP 8.5 Emission Scenario.

Compared with temperature, precipitation is not so easy to analyze. As can be seen from Figure 3, the trend of precipitation changes very irregularly. It is difficult to analyze wildfire behavior from

precipitation. What is certain, however, is that over the next 30 years, there will be less summer precipitation in Hawaii. Wildfire behavior may be more likely occur during these dried, hotter summers.

After completing the analysis of four climate variables. We found that as the wind speed increased, plants with the same water content were more likely to spread and expand the fire. This is the same assumption we expected. As Bai Juyi, a famous Chinese poet, once said in an ancient poem, "**When a wild fire never burns, the spring breeze blows, it will grow again.**"

Reflection on the project

Even though what I've learned from the project is that the impact of climate change on wildfires is huge, I think climate change is manageable in this day and age. Both the International Climate Organization and the Green Foundation are working to reduce the impact of climate change. As national adaptation and mitigation capabilities improve, countries around the world will be able to better control wildfire behavior and minimize damage. I gained a new understanding of wildfire through this Super project. My hope is that wildfires in Hawaii and across the country can be managed in the future.