Forest4Life: Fighting fires with statistical inference

Lab section: C4
Group No# 3
Group Name: Forest4Life
Name of all the team members:

1. **Murtaza Shoeb Moiyadi**
2. **Daniel Cunha**
3. **Jiayu Gu**
4. **Xuan Wu**
5. **Naznin Sultana**

Introduction

Forest fires can have a negative impact on the well being of Earth. They can disrupt important ecosystems, economies, and health of life. So protecting the forest is essential for survival. As such it is paramount to understand how fire spreads so we can know when to expect fire, where it spreads, how long it will spread, and how to prevent it. With this information, we could then model fire behavior, which would allow us to move on to more big picture questions, such as its effect on the climate, economy, and the health of impacted communities.

If we can build a consistent and accurate prediction model with the forest fire data, then we can predict the probability that an area will be burned. This will enable us to take immediate action to save that particular area. Eventually, this will result in reduction of burned area by taking proper policy and immediate action.

Top priority questions we may be able to answer with the data

1.) Is it possible to detect an effect of climate change on fire spreading dynamics in the short time span of the data?
2.) Can we incorporate spatial analysis to understand how fire spreads across the park? What factors lead to faster spreading across neighboring areas? How does wind speed and direction impact spread throughout the forest?
3.) How well can our model predict forward? How far forward in time can we predict? When does it stop working? Can we use our model to inform policy or immediate actions that might reduce the burned area of the forest?

Additional questions of interest pending time and resources

4.) Can we predict the BUI (Buildup Index) and the FWI (Fire Weather Index) from the given Fire Weather codes?
5.) How does rainfall affect the spread of fire? How long is its effect? Does the frequency of rainfall events matter? Or does the total accumulation matter more than frequency?