**Aaron Nelson Capstone**

**Executive Summary**

Amidst the expansive landscapes of the United States, communities have experienced the enduring impact of devastating wildfires, a natural disaster that leaves a profound mark on both the environment and local areas. It is against this backdrop that this project sets out to untangle the complex narrative of how wildfires have unfolded over time in the United States. Have their occurrences surged, and have their locations shifted? How do factors such as precipitation, urbanization, population dynamics, and even road construction influence their frequency? While there is a prevailing belief in an increase linked to climate change, this investigation seeks to delve deeper into the intricate web of influences shaping when and where wildfires occur.

**Motivation**

Hailing from the state of Idaho, where wildfires are a common occurrence, the enduring consequences of these events have ignited a desire to explore the factors shaping the prevalence and patterns of wildfires over time. The recent devastating wildfire in Maui, Hawaii, serves as a poignant reminder of the widespread consequences of such events, further fueling the urgency to understand and address the complex dynamics that drive wildfires across the nation. It is my hope that through this project, I am able to bring awareness, ultimately catalyzing action that might one day help in preventing these fires.

**Data Question**

How has the prevalence of wildfires in the United States changed over time? What has contributed to their increase or decrease as well as any movement over the years. Is there a correlation between changes in population, annual precipitation, increased road contrustuction, etc?

**Minimum Viable Product (MVP)**

* At its completion this project will provide its audience with an interactive dashboard as well as a storyboard of some type that will provide motivational insight into how wildfires have changed over time and what has contributed to that change.
* The data will be displayed through various interactive maps as well as charts, both of which will be utilized to show change over time and correlation between variables.
* Given the intent of this project is “call to action”, data must be presented in a simple yet influential way that can be understood by anyone, and therefore draw support from any audience.
* Key characteristics include:

1. Interactive map of wildfires in the U.S. with filter by year.
2. Interactive map of population density in the U.S. with filter by year.
3. Interactive map of rain fall / draught conditions in the U.S. with filter by year.
4. Charts that show count of record occurrences over time
5. Narrative storyboard

**Schedule (through 1/4/2023)**

1. Get the Data (11/21/2023)
2. Clean & Explore the Data (12/4/2023 -12/08/2023)
3. Create Presentation of your Analysis (12/20/2023)
4. Internal demos (1/2/2024)
5. Demo Day!! (1/04/2024)

**Data Sources**

[National Interagency Fire Occurrence Sixth Edition 1992-2020 (Feature Layer) - Catalog (data.gov)](https://catalog.data.gov/dataset/national-interagency-fire-occurrence-sixth-edition-1992-2020-feature-layer)

[Forest Inventory and Analysis Database - Catalog](https://catalog.data.gov/dataset/forest-inventory-and-analysis-database-a9cd7)

[NCDC Storm Events Database - Catalog](https://catalog.data.gov/dataset/ncdc-storm-events-database2)

[Data (census.gov)](https://www.census.gov/data.html)

[Housing Market Value Analysis 2021 - Catalog (data.gov)](https://catalog.data.gov/dataset/housing-market-value-analysis-2021)

[HUD Low and Moderate Income Areas - Catalog (data.gov)](https://catalog.data.gov/dataset/hud-low-and-moderate-income-areas)

[National Survey of Family Growth - Catalog (data.gov)](https://catalog.data.gov/dataset/national-survey-of-family-growth)

[Transportation Services Index and Seasonally-Adjusted Transportation Data - Catalog](https://catalog.data.gov/dataset/seasonally-adjustment-transportation-data)

[Wildland Urban Interface: 2020 (Map Service) - Catalog (data.gov)](https://catalog.data.gov/dataset/wildland-urban-interface-2020-map-service)

[National Highway Planning Network - Catalog (data.gov)](https://catalog.data.gov/dataset/national-highway-planning-network)

[Motor Vehicle Use Map: Roads (Feature Layer) - Catalog (data.gov)](https://catalog.data.gov/dataset/motor-vehicle-use-map-roads-feature-layer-7d219)  
  
**Known Issues and Challenges**

* Challenge: While retrieving the data there might not be locational information available or the locational information might be such much(geo location plots all over the U.S.) that I am unable to handle it. In both these cases I will attempt find some way to effectively map the locational data by either tying into locational data set or making it area based such as by zipcode or county.
* Challenge: During data exploration I might find there is no relation between wild fires and other factors such as population, water, etc. While this realization isn’t a bad thing it would warrant further exploration to see if there is something that does affect it such as recorded storms, crime related to arson, reported electrical failures in power grids etc. I need to be able to show both no correlations as well as strong correlations and be able to quickly switch and explore additional data if needed.
* Will I be able to buy eggnog from the grocery store? I will look every time but honestly I might be out of luck if they are out.