**California Wildfires 2013 - 2019**

With climate change, California's fire season has become a hot topic. What does a changing climate with periods of drought look like concerning the size, frequency, and deadliness of fires throughout the state?

I'm using a dataset with California wildfire incidents from 2013 through 2019, from data that was originally scraped from the CalFire website.

First off, which particular years and months tend to have the most wildfires? Do they continuously increase over time through the year, or each succeeding year? which county have suffered every year? Do wildfires continuously increase or decrease? Which month is more dangerous?

With adverse impact of Global warming and climate change I hypothesised that:

* The number of fire per year would increased
* The most fire happened in summers
* The number of acres burned increases with each year

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After analysing the number of wildfire incidents over the period of 2013 - 2019, we found that 2017 is a very violent year and the fire rate is increasing year by year. Also if we analyse the wildfire incident for each county, we found the same trend in every county.

As we predicted the number of acres damaged has also increased over the time. We can see this from the graph analysis shown below.

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As we see from the graph the number of acres damaged is continuously increasing as The year is increasing, even if 2017 is a very violent year and there is slight drop in 2018 and 2109 on the number of fire incidents, but still the number of acres burned is still increasing.

Is the timeline of wildlife fires for each county the same for every year or it is different.

As we found that the timeline for fire is not even for each county, it is varying from county to county, but if we follow the fire trend then almost every county aligns them. For most of the county in 2017 the number of fire incidents is high in December and then in the summer.

But mostly the number of incidents from July to September.

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As suspected, the amount of fires per year increased overall between 2014 and 2017. 2018 and 2019 however, have a drop in the number of fires, though each year still has more accidents than years previous to 2017.

As to my hypothesis, the most fires occur during the month of July, with the biggest jump between May and June with the ramp up in warmer temperatures

Why is this? Due to ongoing drought, what were traditionally thought of as the biggest fire months (September, October), are now being pushed earlier in the calendar. Fire season appears to stretch over 7 months, where those months have around 50 or more fire incidents per month.

While the occurrence of mega-fires remains low compared to the number of fires that occur each year, there is the sign of a trend where larger fires appear more frequently as time passes.

Does it follow that the more frequent the fires in a year the higher the fatalities and damage?

I suspect that the number of fatalities and amount of damage corresponds with the number of fires and the number of acres burned each year.

* The number of fires and acres burned goes up, so do fatalities and damage.

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While 2017 was the year with the most fires, it did not have the most fatalities - the highest number of deaths occurred in 2018, which is due to the Camp Fire which destroyed the town of Paradise very quickly.

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Overall fatality numbers are low for most years thankfully, but the years with the highest incidence of fires (2017-2019) do have the largest number of deaths.

There is a disconnect between the number of fatalities and acres burned, which can be seen in the above graph. So the hypothesis that deaths correspond with larger fires is not necessarily true.

The counties with the highest frequency of fires do not have the most acres burned!

Colusa county has the most acres burned of all California counties. It is a mostly rural county with grasslands and wooded areas on the western side.

Alameda, which had a high frequency of fires, has a low number of acres burned, which most likely reflects its urban/suburban dominated environment.

### **Conclusion**

While there are a couple of surprises with the data, overall the results support my hypothesis that fires are generally

* Becoming more frequent
* Burning more acreage
* Causing more death and destruction with each passing year

With the continued rise in average temperature, higher prevalence of drought, and the continued development of land for housing along previously wild areas, fires will most likely continue to get larger, more frequent, and continue to cause large amounts of property damage and loss of life within the state.

### **What can we do about this?**

Our changing climate and drought conditions are issues on a scale that will take a large amount of cooperation, and to some extent there's no way to reverse some of those changes.What we can do is prepare on a local level, and think about planning for the future of the state.

* Avoid building housing near wild, undeveloped areas which are at greater risk of fire. The solution may be more and denser housing near urban and suburban cores.
* Putting in place early warning systems and ensuring each populated area has an evacuation plan to avoid loss of life.
* Creating defensible space around buildings.
* Improvements in forest management and use of controlled burns to remove highly flammable material to reduce intensity of wildfires

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