**Meta Title:** Wildfires in Northern Nevada | Data Insights | Truckee Meadows Tomorrow

**Meta Description:** Learn how we can use data-driven insights to create mitigation strategies around prevalent wildfires in Northern Nevada.

# A Deep Dive into Wildfires in Northern Nevada Through Data

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Report Reviewed by TMT's Data Advisory Group

In 2019, I lived in Chiang Mai, Thailand, a city with some of the worst air quality in the world. At one point, the Air Quality Index (AQI) soared over 600, far exceeding the 301

AQI threshold for hazardous air quality. There, February through April is known as “smoke season,” where smoke covers the city due to farmers burning leftover crops in order to fertilize the soil and prepare for the next crop cycle.

Fast forward to September 2022, it was the morning of the Reno Hot Air Balloon races, and the sky looked eerily similar to an average day during Chiang Mai's smoke season. The Mosquito Fire had laid a thick blanket of smoke over Reno and was now threatening to cancel the beloved Reno Hot Air Balloon races. This got me thinking more about wildfires in our area, it does seem that fires are increasingly prevalent. Instead of going off a feeling, though, I decided to dig into the data.

In 2024 we experienced multiple fires that greatly impacted our communities, the Gold Ranch Fire, which destroyed a home in Verdi; and the Davis Fire, which burned nearly 6,000 acres, 11 homes and three other structures. Taking a look at the data can tell us more of the story about fires in Northern Nevada.


## How Wildfires Affect Our Quality of Life

The mission of Truckee Meadows Tomorrow is to enhance our quality of life by providing accurate, timely, and objective data as the basis for community engagement and dialogue.

Before we take a look at specific data, we wanted to observe how wildfires affect our quality of life. Wildfires have far reaching consequences on several quality of areas of life, such as Health & Wellness, Housing, Economic Well-Being, and Public Safety not just solely environmental consequences.

## Health & Wellness

Wildfires can have enormous impacts on our Health & Wellness. Health risks are mostly related to the inhalation of smoke during periods of poor air quality. This type of air pollution has been linked to serious health effects, including aggravated asthma, decreased lung function, nonfatal heart attacks, and even premature death in people with heart or lung disease. Beyond physical health, wildfires and poor air quality can impact Mental & Behavioral Health. Smoke can cause stress by limiting daily outdoor activities, potentially isolating us from

friends and family, and just generally disrupting our daily routines.

> *"Since 1971, six of the top ten worst air quality days for Northern Nevada have been within the last five years all due to wildfire smoke. The Western US is facing ever-increasing temperatures leading to a longer wildfire season and more intense fires. As a result, everyone is being exposed to unprecedented levels of air pollution resulting in an unhealthier community."*
>
> - ***Brendan Schnieder**, Senior Air Quality Specialist, Northern Nevada Public Health*

## Housing

As we have experienced with the Davis and Gold Ranch fires, wildfires can result in the wide destruction of homes, leaving community members and families displaced. In our current climate of housing shortages, this can cause a huge burden on communities.

## Economic Impact

Wildfires can have an immense impact on local Economic Well-Being by directly affecting disruptions to businesses,

particularly in sectors such as agriculture, forestry, and tourism. Additionally, aside from the potential loss of their homes, homeowners can be financially affected through increased insurance costs, loss in property value, or be potentially dropped by insurance companies for living in high risk areas.

## Environmental Damage

Wildfires can cause lasting damage to our Natural Environment. Fine particles released into the air reduce visibility, contribute to haze, and can travel long distances before settling. Once deposited, they can acidify lakes and streams, deplete soil nutrients, and harm forests, crops, and even cultural landmarks. These impacts can disrupt ecosystems and the services they provide to communities for years.

## Public Safety

Wildfires can pose a direct threat to public safety. The rapid spread of wildfires often requires large scale evacuations, which can be chaotic and dangerous, specifically for vulnerable populations in our community. These evacuations also raise the risk of looting in

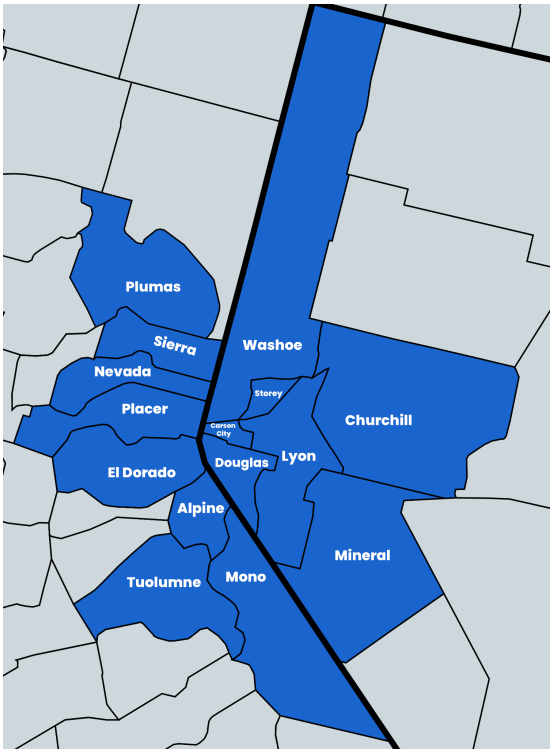
unsecured areas, adding another layer of trauma and loss for affected residents. Wildfires require the attention of many first responders, taking away resources from other areas in the community.


## The Data

The dataset we use for this analysis is the Nevada Wildland Fire Occurrence, managed and maintained by The Bureau of Land Management (BLM) Nevada, Fire and Aviation program. This dataset contains all fire incidents in Nevada since 1980, as well as fires outside of Nevada (e.g.,

California, Utah) that Nevada resources were dispatched to.

In this analysis, we are also taking a look at temperature data and its relationship to fires in the region. This data is pulled from Climate Data Online (CDO), using the Reno-Tahoe International Airport station.




## Data Preparation

To prepare the data for this analysis, we filtered it based on relevant counties. Relevant counties include:

- Washoe, NV
- Carson City, NV
- Churchill, NV
- Douglas, NV
- Lyon, NV
- Mineral, NV
- Storey, NV
- Alpine, CA
- El Dorado, CA
- Mono, CA
- Nevada, CA
- Placer, CA
- Plumas, CA

- Sierra, CA
- Tuolumne, CA

With the expertise of Dr. Hamed Ebrahimian, a wildfire engineering specialist at the University of Nevada, Reno, we excluded prescribed burn fires, building fires, and all fires smaller than one acre.

We selected these counties because of the significant potential for wildfires in these areas to cause impacts in Northern Nevada. Fires in these areas can disrupt transportation logistics, threaten public safety, and affect local ecosystems.  Further, prevailing westerly winds often bring smoke from wildfires burning in California to the Reno/Sparks region, affecting air quality.  Thus, it was important to select a study area that captured wildfire-prone counties surrounding WAshoe County.

## Data Limitations

While this analysis focuses on wildfires in selected counties of Northern Nevada and neighboring areas, it is

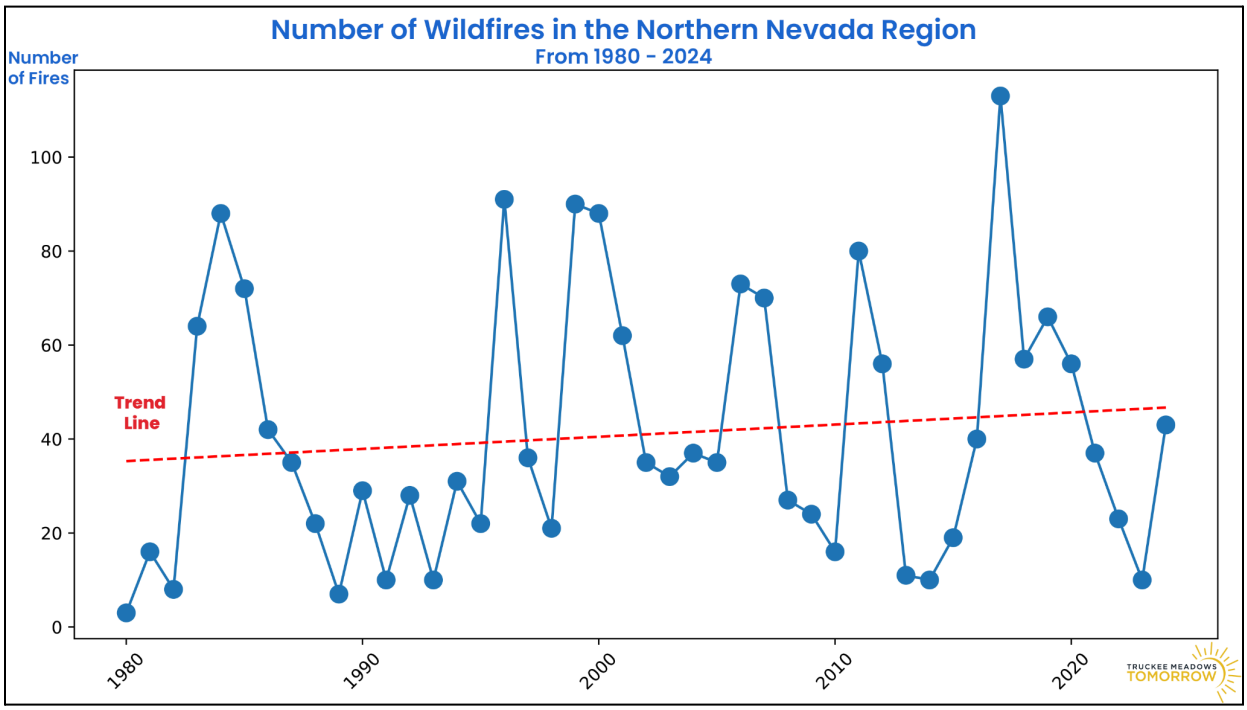
important to note that the dataset does not capture all wildfires that have significantly impacted the region.

As such, this analysis should not be interpreted as a comprehensive account of all wildfire events that have affected Northern Nevada, especially those whose impacts, such as smoke and public health effects, transcend county or state boundaries.

Additionally, fire reporting requirements in the 1980s and 1990s were not what they are today. In other words, there is a chance that there are fires and acres unaccounted for in earlier decades, which may lead to inaccuracies when plotting the dataset as it exists today.

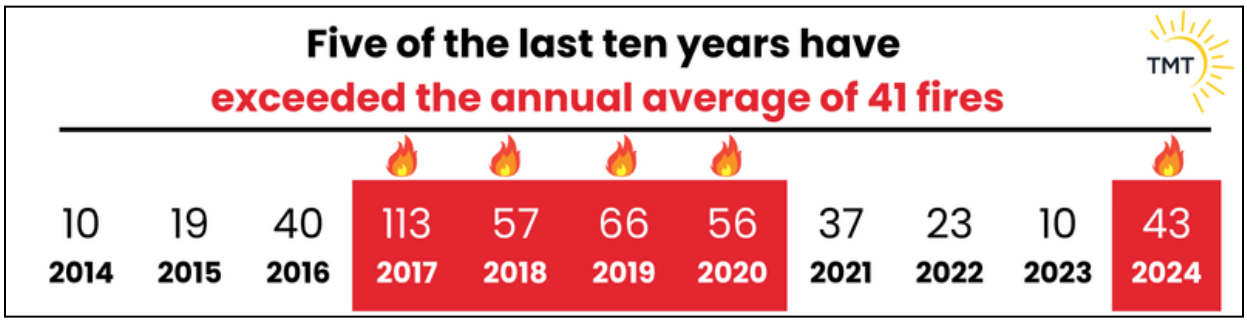
**Note: The fires in California counties reflect only incidents to which Nevada units have been dispatched, and do not include all the fires in each California county.**

## Fire Activity Has Climbed Since 1980

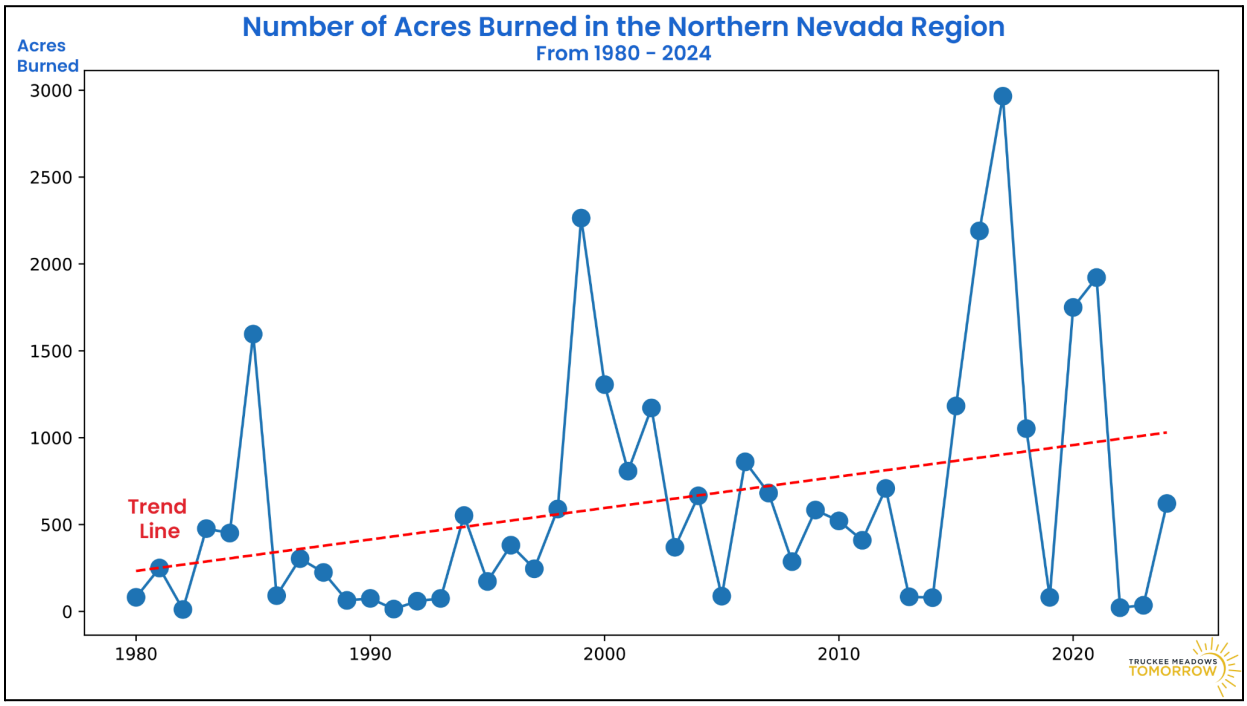



If we examine fire trends over the past few years, we see a decrease in fire occurrences since 2017. However, this does

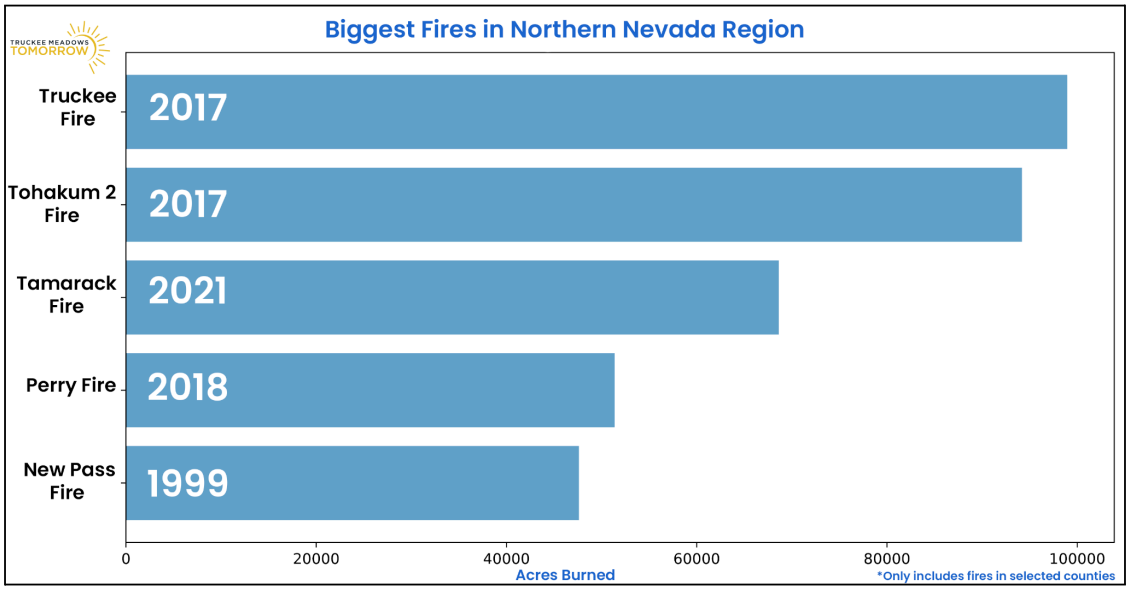
not tell the full story. When looking at fire data over a longer period since 1980, **there is an upward trend in the number of fires over time.** The data also reveals several peaks and valleys, likely influenced by factors such as temperature, vegetation growth, and wind conditions. Further analysis is needed to better understand the causes behind peak years and the overall long-term trend in fire activity.



# Wildfires Are Becoming More Intense & Destructive

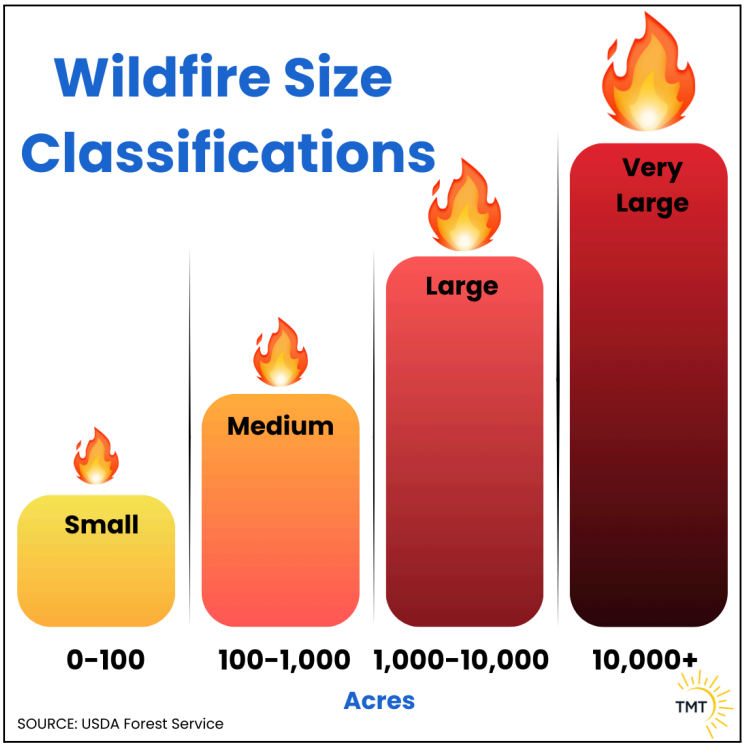


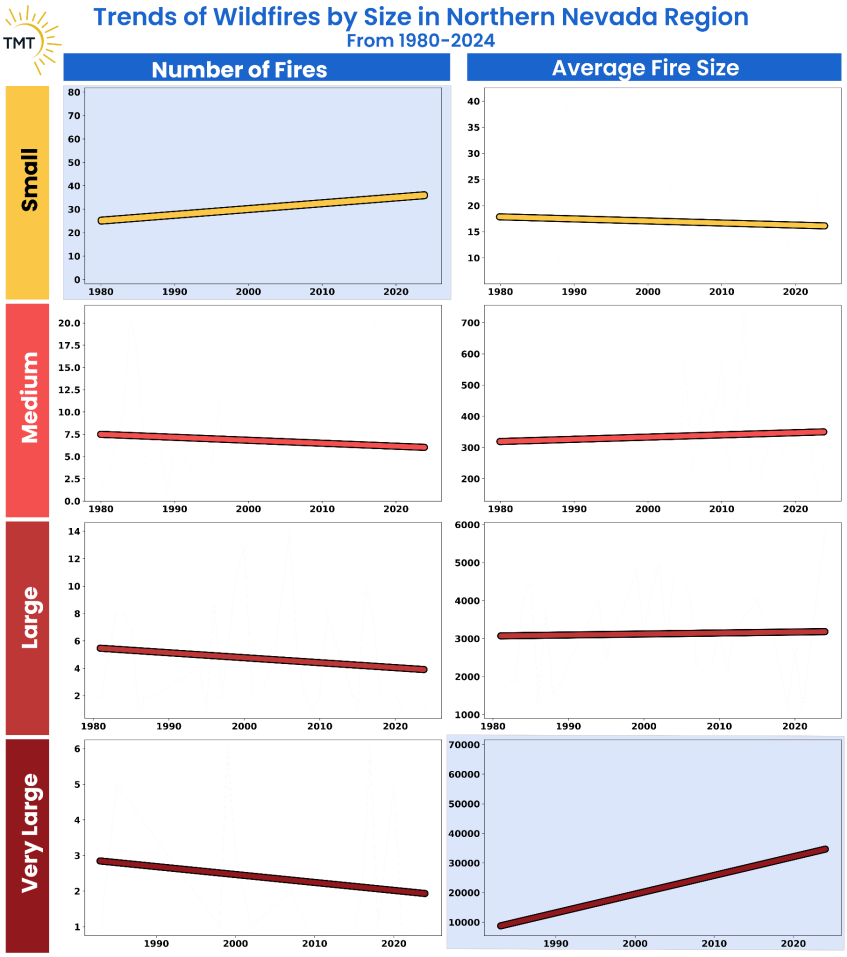

Looking at the average size of wildfires per year, we observe significant year-to-year variability. However, a clear trend has emerged since 2015 wildfires have become notably more intense. **Four of the five largest wildfires in the region's history have occurred within the past seven years.**




## Wildfires by Size

Next, we take a closer look at wildfires by size classification to identify which types are driving the upward trends in both the number of fires and the average fire size.






## Small Fires are Increasing, but Their Growth is Being Contained

The number of small fires in Northern Nevada has been rising, but **their average size has slightly declined**. This suggests that while more small fires are igniting in the area, they are not escalating into larger incidents. This could indicate that **fire suppression efforts and early response strategies are effectively containing small fires before they grow out of control**.

## Very Large Fires are Becoming More Intense

**The number of large fires has remained relatively low and stable, but their average size has increased dramatically over time.** In certain years, such as 2017, 2018, and 2021, very large fires burned over 50,000 acres each year.

## Medium and Large Fires Are Less Frequent, but Remain a Concern

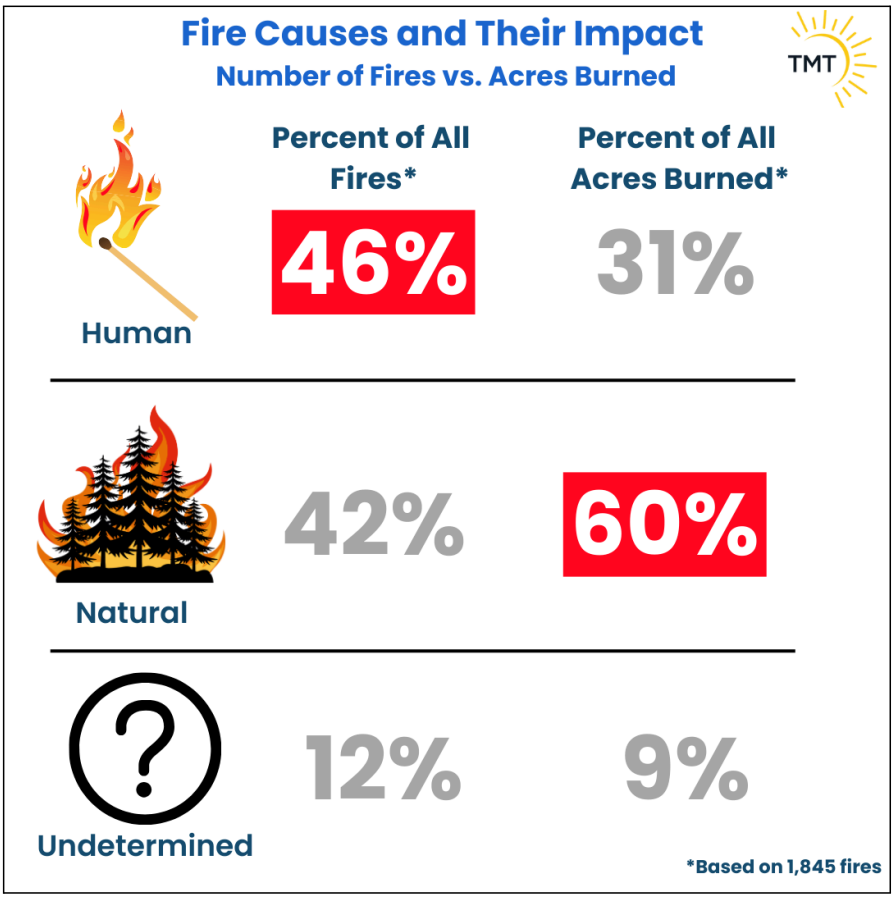
This data shows that medium and large fires are generally declining, which could be a result of improved fire prevention and suppression strategies.

However, the average size of medium and large fires has remained stable or even slightly increased, suggesting that while these fires may not occur as often, they can be difficult to control when they do.

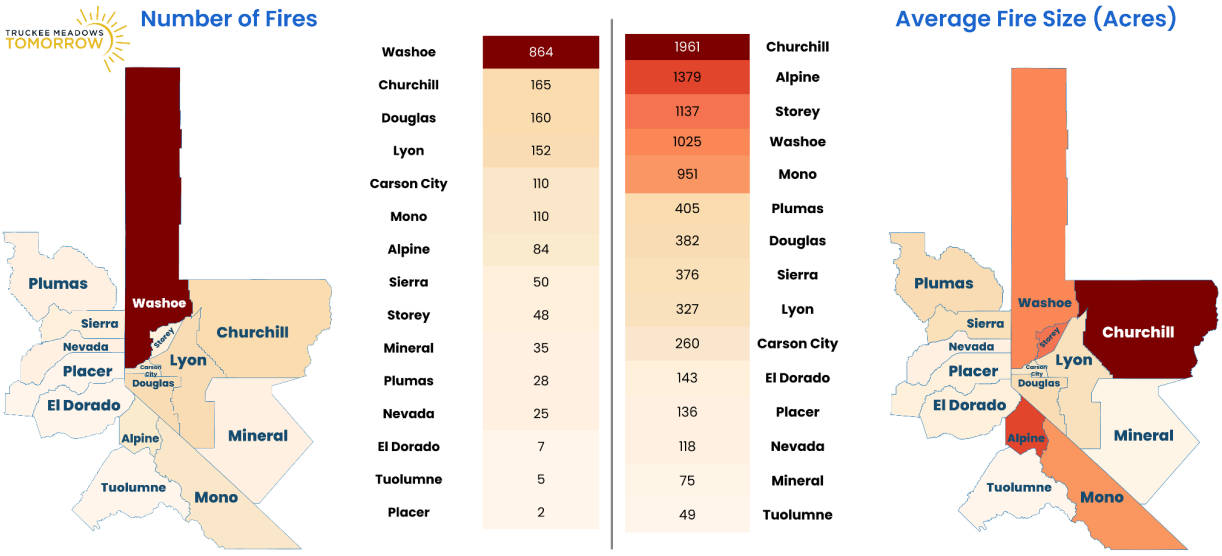
## Human-Caused Fires Outnumber Natural Ones, but Natural Fires Burn Twice the Acres

Even though humans cause more fires than natural events, **naturally caused fires burn almost twice as many acres as human-caused fires.**

This makes sense, since fires started by humans tend to occur in places that humans can easily access and in turn are more accessible to fire fighters increasing the timeliness of their response.



# Washoe Leads in Fire Count, but Other Counties See Larger Burn Areas




From the data above, we observe several insights about fire incidents in the region:

## Washoe County Dominates in Fire Frequency in the Region

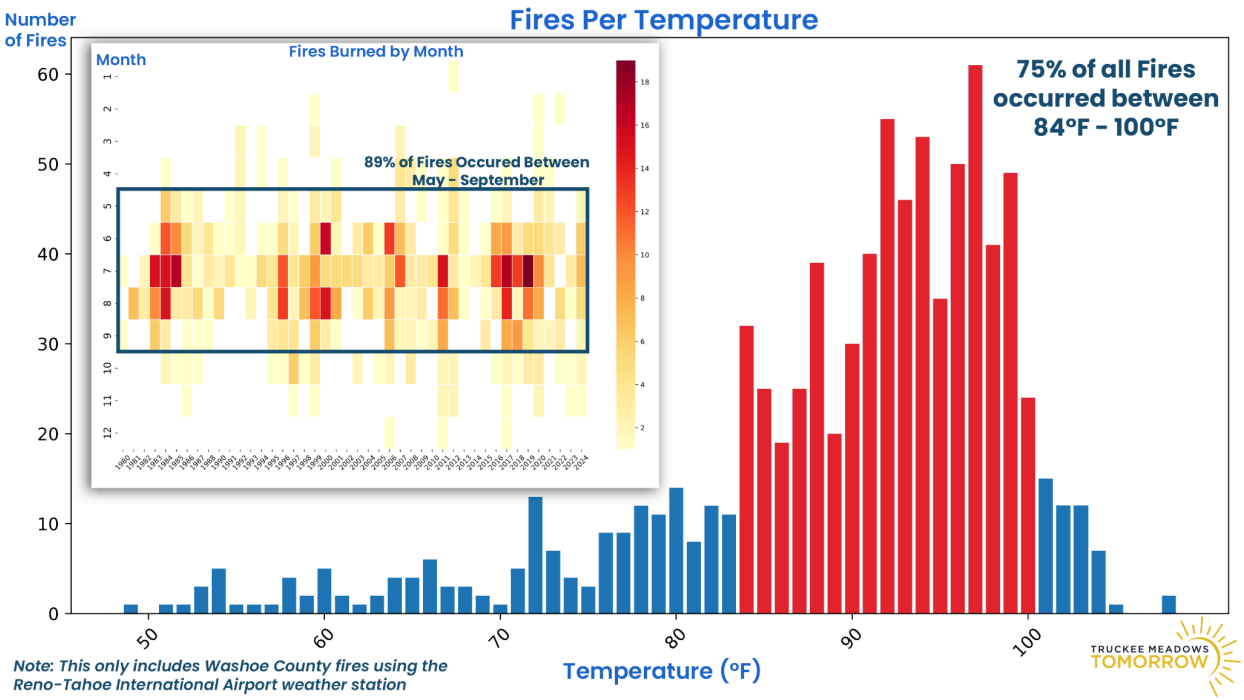
**Washoe County experiences five times the number of fires as Churchill County, which has the second-highest occurrences at 165 fires.** The high number of fires in Washoe is likely due to a combination of population density, human activity, and environmental factors.

## Average Fire Size Is Driven by Large Natural Fires

Interestingly, although Washoe has the highest number of fires, it doesn't have the largest average fire size. **There's a significant gap between the top five counties by average fire size and the rest.** Counties like Churchill, Alpine, Storey, Washoe, and Mono stand out because they experienced natural fires that burned large areas, contributing to their higher averages.

Overall, this data highlights the contrast between fire frequency and fire size, showing that even though some counties may experience less fire occurrences, they may have much larger burn areas.

# 75% of Fires Ignite in Temperatures Between 84°F and 100°F




Temperature and wildfires are closely linked, **as warmer conditions significantly increase the likelihood of fire occurrences**. This trend is evident in fire data: the majority of fires ignite between May and September, aligning with the region's hottest and driest months. During this period, vegetation becomes highly flammable, creating ideal conditions for wildfires.


## Key Findings

**Fire Activity Has Increased Over Time** – While there has been a decline since 2017, the overall trend since 1980 reveals a steady rise in fire occurrences. Peaks in activity are likely driven by environmental factors.

**Smaller Fires Are Increasing, but Being Contained** – While small fires are becoming more frequent, their average size is decreasing, which may indicate that suppression efforts and early response strategies are effectively preventing fires from growing larger.

**Wildfires are Becoming More Intense** – Although very large wildfires are occurring less often, they are more intense when they do occur. Since 2015, the average wildfire size has exceeded the historical threshold of 901 acres in six of the last ten years.

**Human-Caused Fires Outnumber Natural Ones, but Natural Fires Burn More Land** – Despite humans causing more fires, naturally ignited wildfires burn nearly twice as much acreage. Natural fires often occur in remote areas, leading to delayed response times.

**Washoe County Leads in Fire Count, but Other Counties Experience Larger Burns** – Washoe County has five times more fires than Churchill County, but fires in Churchill burn almost 1000 acres more then fires in Washoe

**Temperature Plays a Role in Fire Occurrences** – 75% of wildfires ignite when temperatures are between 84°F and 100°F.

## Wildland Fire Prevention Strategies

As we continue to see hotter and drier conditions in our region, it is likely that the risk of wildfire will increase, making  proactive mitigation essential. Here are key

strategies to reduce the impact of wildfires according to the National Association of Counties.

### Defensible Space

Clear flammable debris and vegetation around structures and homes to create a buffer zone that slows wildfires.One method of reducing flammable debris(also known as fuel management) in controlled burns which are fires intentionally set by fire professionals to prevent future fires from spreading.

### Firebreaks

Natural barriers like rivers and man-made ones like roads or cleared strips of land act as firebreaks. These help contain wildfires by interrupting their path, limiting their ability to spread.

### Building and Infrastructure Design

Homes and other structures in fire prone areas should be constructed using fire-resistant materials and emphasize fire-safe landscaping.

### Implement Early Detection Systems

Faster fire deduction can lead to quicker response times for first responders and reduce damages. This could be especially important in less populated areas.

### Educate the Community

Educating residents on the risks of wildfire and how to mitigate them empowers communities to take proactive steps and respond more effectively when fires occur.

## Conclusion

Wildfires are becoming an increasingly urgent issue in the Northern Nevada region. Long-term trends show rising fire activity and intensifying burn areas. NASA identifies Earth's warming climate as a key driver of increased fire activity. Additional work can be done in this space by examining data points, such as vegetation growth, precipitation, and wind patterns, to gain a deeper understanding of wildfires and even predict when and where they will happen. Further analysis of this data can help improve wildfire mitigation strategies.

**By leveraging data-driven insights, firefighters, policymakers, and communities can work together to develop better strategies for managing wildfires. The data is clear: wildfires are not just a seasonal challenge, but a long-term issue requiring attention and action.**

**We hope to make this information available on NevadaTomorrow.org so it's easily accessible to the community. If you're interested in sponsoring this effort, please email info@truckeemeadowstomorrow.org.**

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