



# Using Location Data To Prepare For The Next Wildfire Season

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FOURSQUARE

 AccuWeather

 plume labs

Measuring air quality's  
impact on foot traffic  
with AccuWeather,  
Plume Labs and  
Foursquare.

# Overview

After a historic wildfire season in 2020, consumers and businesses alike are bracing themselves for another year of severe weather conditions.

In fact, AccuWeather predicts there will be a very active fire season across the western half of the country. As of late April, **47%** of the country was experiencing drought conditions. The drought will play a critical role in the wildfire activity throughout the year and will certainly affect air quality.

To help prepare, we have combined data from AccuWeather, Plume Labs and Foursquare in order to analyze consumers' behaviors during last wildfire season, quantifying how major markets on the West Coast – **Seattle, Portland, San Francisco** and **Los Angeles** – were affected by the air quality.

We explored not only the impact of air quality on mobility overall, but also on visitation to specific types of places such as grocery stores, restaurants and bars.



# Methodology

Foursquare analyzes foot traffic patterns of millions of Americans that make up our always-on panel. All data is either anonymized, pseudonymized, or aggregated, and is normalized against U.S. Census data to remove age, gender and geographical bias.

For this study, AccuWeather provided historical air quality data for Seattle, Portland, San Francisco, and Los Angeles from 2018 through 2020, using **Plume Air Quality Index (AQI)**, which offers a normalization of pollutant concentrations in terms of health impact.



# Methodology

Foursquare analyzed the impact of abnormally poor air quality stemming from wildfires on foot traffic to different categories and brands, comparing average visitation on days with outlier AQI values versus days with AQI in the standard range, averaged across major markets for sample size.

We focused on outlier AQI values more than 1.5 interquartile ranges (IQRs) above the third quartile (LA 61.7+, Portland 38.4+, Seattle 41.1+, San Francisco 43.5+) throughout 2018-2020.

By using **Plume Air Quality Index (AQI)**, we didn't only look at specific days when wildfires were active in a given city, but rather, the days in which air quality in a city was strongly affected -- in some cases even after the actual burning had stopped.



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So, what did  
we find?

# Analyzing Air Quality's Impact On **Leisure Activities**



# Outdoor activities were unsurprisingly the most impacted by wildfires

Foot traffic to outdoor destinations in Los Angeles, Portland, San Francisco and Seattle fell considerably on days with unusually high AQI.

**Insights:** Less people were hiking, biking and walking due to high air quality index (AQI).

Likewise, fewer people were partaking in outdoor sports like basketball, tennis and golf on days with unusually high AQI.



On days with unusually high AQI, visits to outdoor destinations in major west coast markets fell by...

-14.1% TRAILS

-13% PARKS

-12.4% BEACHES

-12.4% PLAYGROUNDS

-10.2% GOLF COURSES

-6.6% ATHLETICS & SPORTS VENUES

# Analyzing Air Quality's Impact On Dining & Nightlife



# Consumers are also less likely to go out to **eat and drink** on days with unusually poor air quality due to wildfires

Casual dining chains were more impacted than fast food chains. However, some QSR chains were more affected than others.

For example, foot traffic to **Starbucks** declined by **-3.3%**, while visits to **Burger King** only declined by **-2.3%**.



**-4.5%**

RESTAURANTS  
OVERALL

**-4.5%**

CASUAL  
DINING

**-2.5%**

FAST FOOD

**-7%**

BARS

# Analyzing Air Quality's Impact On **Specialty Retail**



# People are also less likely to visit **specialty retailers** on days with unusually high AQI due to Wildfires

For example, foot traffic to **sporting goods stores** in Los Angeles, Portland, San Francisco and Seattle fell by **-9.2%** on these days and visits to **clothing stores** fell by **-6.7%**.



**Hardware stores** were less impacted by wildfires compared to other specialty retail categories. On days with unusually high AQI, visits in major west coast markets fell only...

**-2.2%**

HARDWARE  
STORES OVERALL

**-1.8%**

THE HOME DEPOT

# Analyzing Air Quality's Impact On **Essential Retail**



# Foot traffic to places where people go to stock up on supplies and essentials was less impacted by wildfires

In fact, visits to **warehouse stores** in Los Angeles, Portland, San Francisco and Seattle did not fall at all on days with unusually high AQI due to wildfires.



**Grocery store** traffic only declined by **-1.4%** on days with unusually high AQI. Certain grocery store chains were more affected than others by the fires.

- 3.2% WHOLE FOODS MARKET
- 1.5% TRADER JOE'S



**Pharmacy and drug store** traffic declined by only **-0.8%** on days with unusually high AQI due to wildfires.

- 4.3% CVS
- 2.0% WALGREENS



Visits to **big box stores** in major west coast markets fell by only **-1.4%** on days with unusually high AQI.

- 3.3% TARGET

# Key Learnings & Takeaways

# Marketers can use these findings to **prepare for the 2021 wildfire season**

For example...



**Restaurants** -- particularly casual dining brands -- should consider tailoring messaging to highlight delivery on days with poor air quality, as consumers are significantly less likely to dine out on these days.



**Grocery stores** with delivery options could also highlight online ordering and delivery to shoppers during wildfire season, as air quality does affect visitation even to these 'essential' retailers.



**Fashion retailers** may want to focus marketing initiatives on e-commerce during the height of wildfire season, as consumers are much less likely to shop in person for clothing and accessories when air quality is poor.

# Thank You

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