

## **CONCLUSIONS**

### 1. Unhealthy Air Quality 2-10m Downwind from Fire

The hypothesis was supported, and it was found that burning wood in a fire pit did indeed affect hyperlocal air quality 2-10m downwind of the fire pit. On average, PM2.5 concentration increased from a pre-fire baseline of “Good” on the AQI (Air Quality Index) to “Unhealthy” or worse.

The results were statistically significant, with a 95% confidence interval of 115.7 - 215.58 micrograms per cubic meter, which is in the “Unhealthy” to “Very Unhealthy” AQI ranges. The fire in this experiment was intentionally small to average, to avoid exaggerating results. A bigger fire may emit even more PM2.5.

### 2. Moderate or Good Air Quality 12-18m Downwind from Fire

The hypothesis was supported, and it was found that burning wood in a fire pit did indeed affect hyperlocal air quality 12 -18m downwind of the fire pit. On average, PM2.5 concentration increased from a pre-fire baseline of “Good” on the AQI to “Moderate” or the upper end of “Good.”

The results were statistically significant, with a 95% confidence interval of 5.95 - 24.65 micrograms per cubic meter, which is in the “Good” to “Moderate” AQI ranges.

### 3. Upwind Has Much Better Air Quality than Downwind

Support for the hypothesis was weak on the upwind side of the fire (2 -18m). Most readings were not affected, and the average air quality remained “Good,” except the average concentration at 2m from the fire, which was “Moderate.” In addition, there were a few individual outliers that were up to the “Unhealthy” range.

## **RELEVANCE**

This information could be useful for people who burn wood, people who are around wood smoke, and people who are sensitive to smoke or would like to avoid poor air quality. If someone has to be around a fire, this experiment indicates that the best place to be is on the upwind side and more than 2m away from the fire.