

# Palisades Wildfire Burned Acres Forecast

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## 1 Introduction

Los Angeles County experiences destructive wildfires on a yearly basis. Incident command posts issue situation reports throughout an event, logging (i) the latest containment percentage, \*\* (ii)\*\* personnel deployed, and (iii) the cumulative acreage burned. The *CleanData.csv* file supplied for this project contains **344 timestamped status rows** covering the **~5-week window between 7 January 2025 and 10 February 2025** for a single large incident.

**Research question** *Can we predict the eventual Acres Burned from the information available mid-incident—specifically containment percentage and staffing levels—so that managers can estimate how much additional land is at risk?*

A reliable regression model would allow operations chiefs to allocate crews and equipment more efficiently during the active phase of a fire rather than waiting for post-incident totals.

## 2 Methodology

### 2.1 Data preparation

```
# raw import (base R)
wild <- read.csv("CleanData.csv", stringsAsFactors = FALSE)

# basic sanity-check
cat("Rows before NA drop:", nrow(wild), "\n")

## Rows before NA drop: 344

# omit records with any missing core variable
wild <- na.omit(wild[, c("Update.Timestamp", "Acres.Burned..Size.",
                        "Containment.Percent", "Total.Personnel")])
cat("Rows after NA drop:", nrow(wild), "\n")

## Rows after NA drop: 295

# convert timestamp to POSIXct and extract calendar features
wild$UpdateTime <- strptime(wild$Update.Timestamp,
                           format = "%m/%d/%Y %I:%M %p")
wild$Date <- as.Date(wild$UpdateTime)
```

```

par(mfrow = c(1,3))
hist(wild$Acres.Burned..Size., 30, main = "Acres Burned", xlab = "Acres")
hist(wild$Containment.Percent, 30, main = "Containment %", xlab = "%")
hist(wild$Total.Personnel, 30, main = "Personnel", xlab = "Number")

```

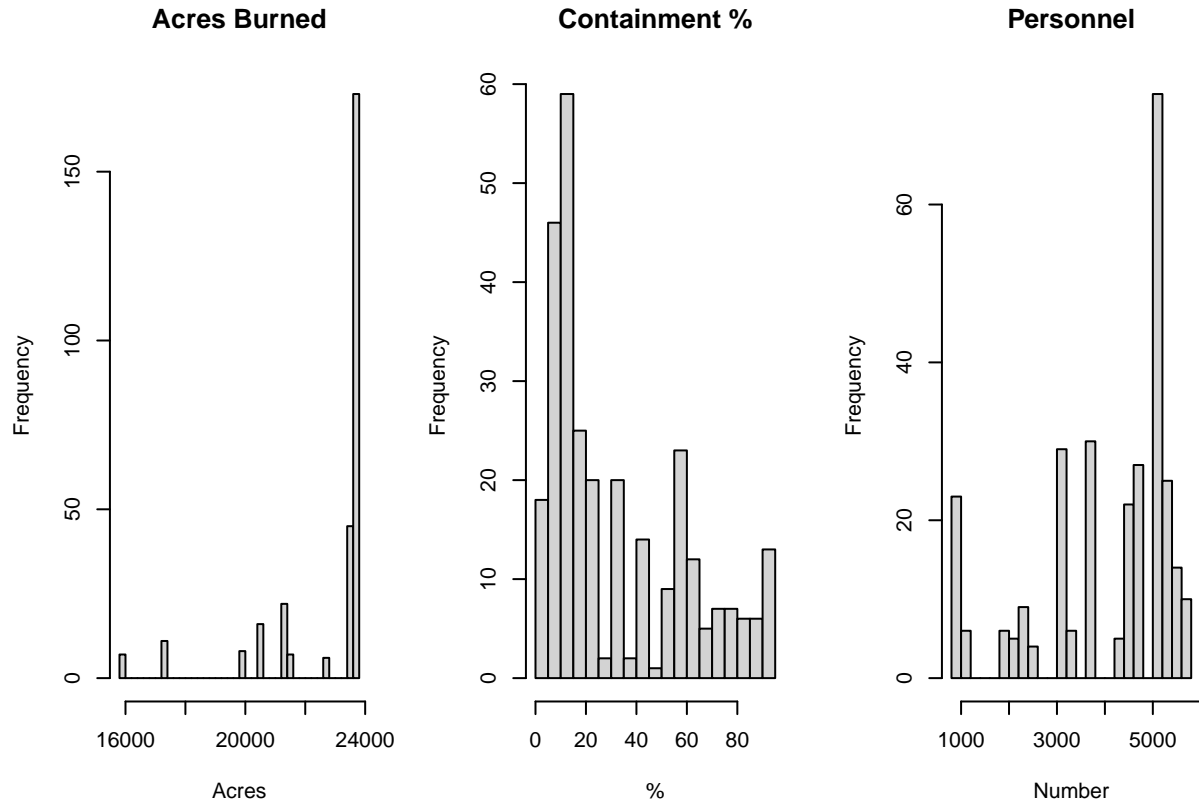


Figure 1: Exploratory plots of the key variables.

```

par(mfrow = c(1,1))

pairs(wild[, c("Acres.Burned..Size.",
              "Containment.Percent",
              "Total.Personnel")],
      main = "Scatter-plot matrix")

```

*Observation.* Acres burned is right-skewed (long tail at small fires), while containment is heavily left-skewed (many early-stage updates). Personnel and containment appear weakly correlated, suggesting that collinearity is not a major concern.



Figure 2: Exploratory plots of the key variables.