

U.S. Wildfires

FPA Data Results

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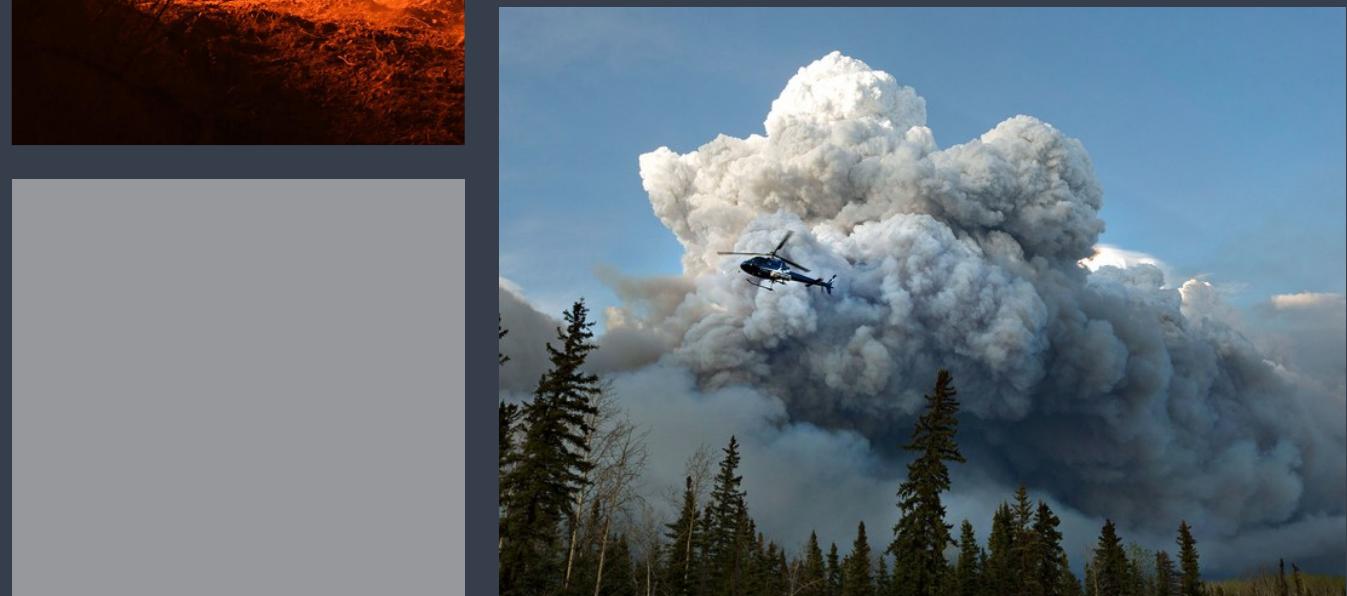


What is the goal of the project?

Create a *strategy* that departments could use to predict future wildfire characteristics.

What is the *strategy*?

Using ML, provide recommendations for the prevention and allocation of resources to fight future fires.



Data collected by the Fire Program Analysis (FPA).

(Not So) Fun Facts:

- 72,400 wildfires per year.
- Over 7 million acres burned per year since 2000.
- \$2.4 billion in fire suppression in 2017.
- \$71 billion in total losses.



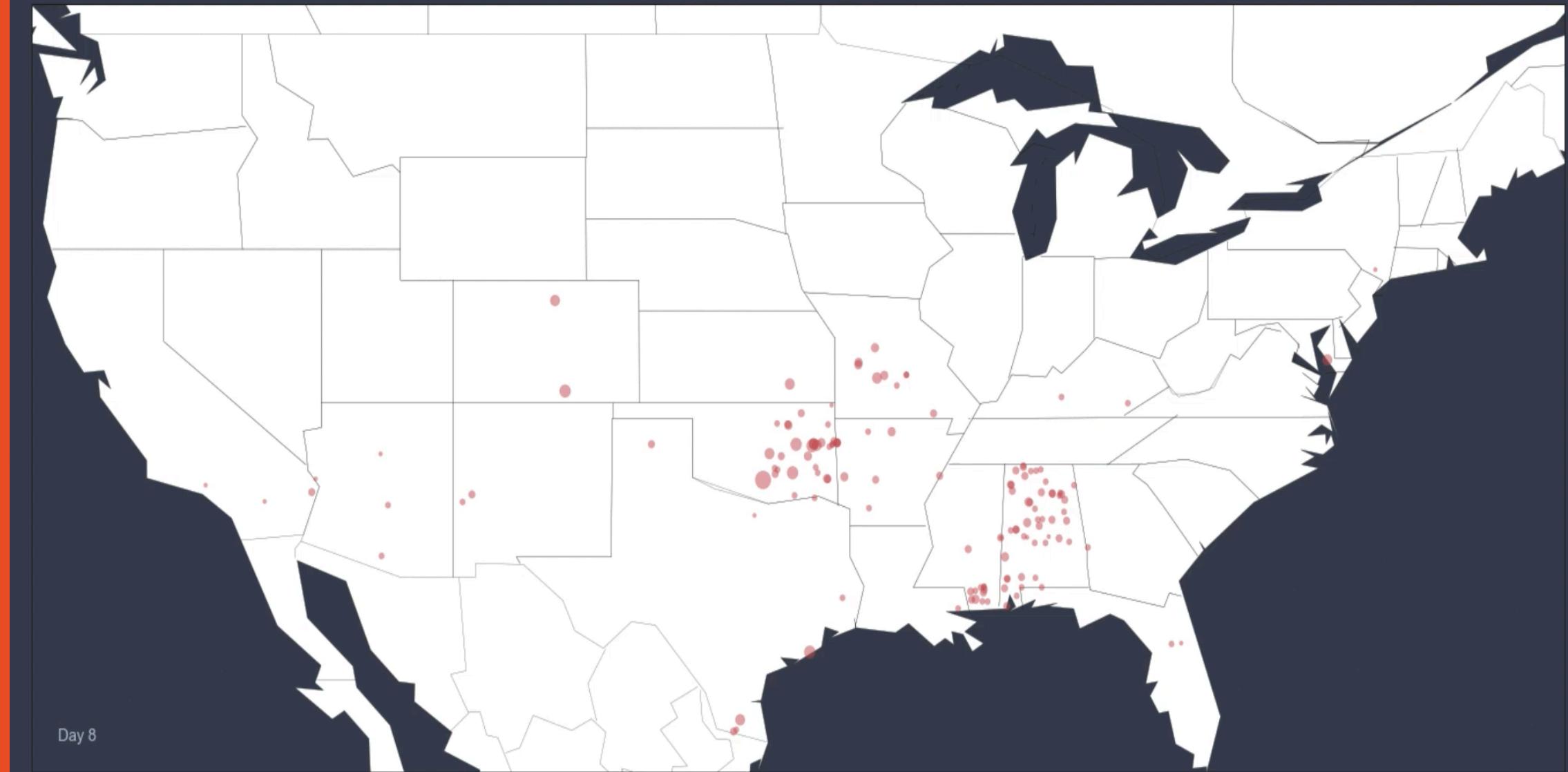
Let's Explore Wildfires!

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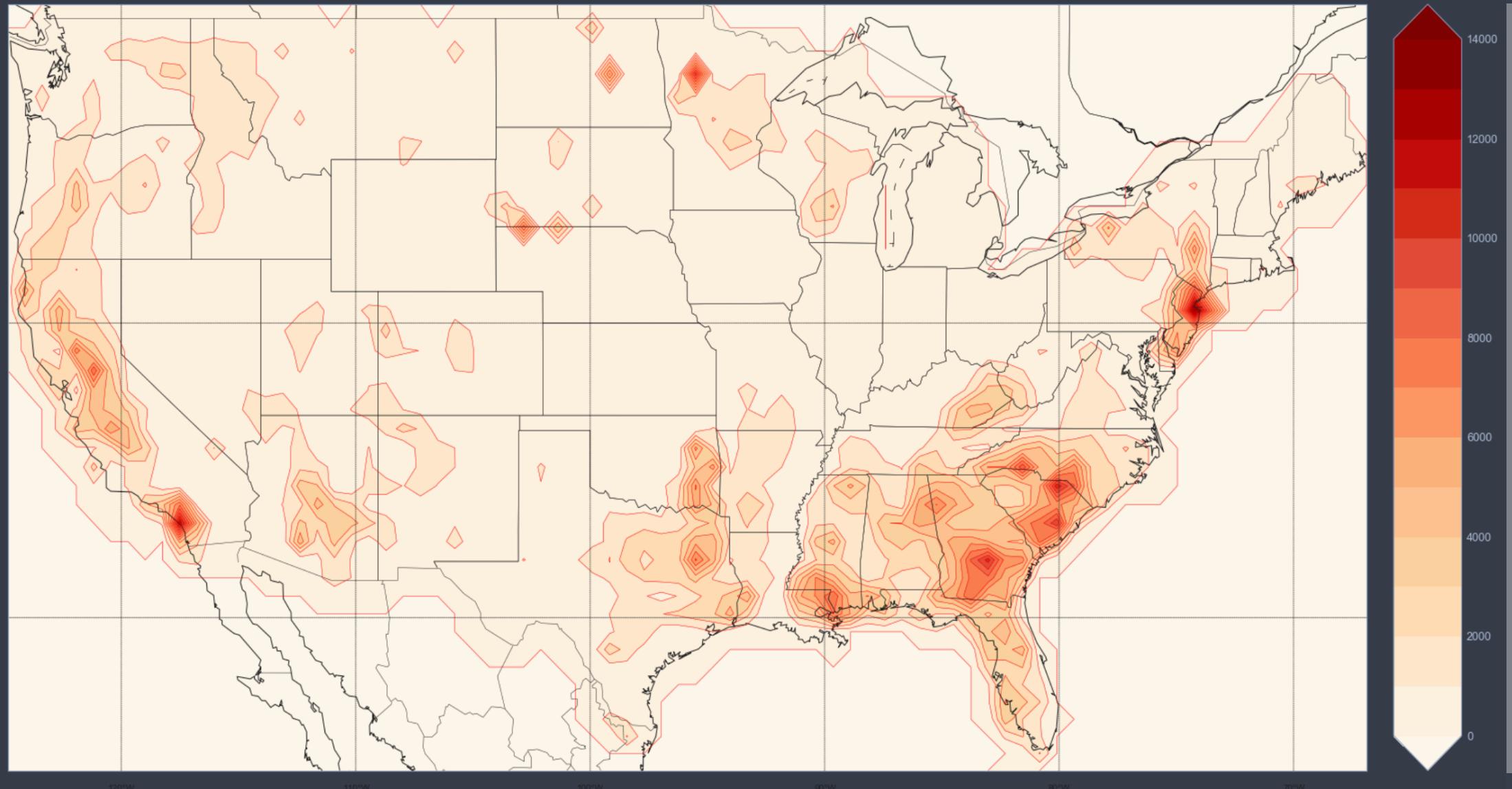
Let's Explore Wildfires!



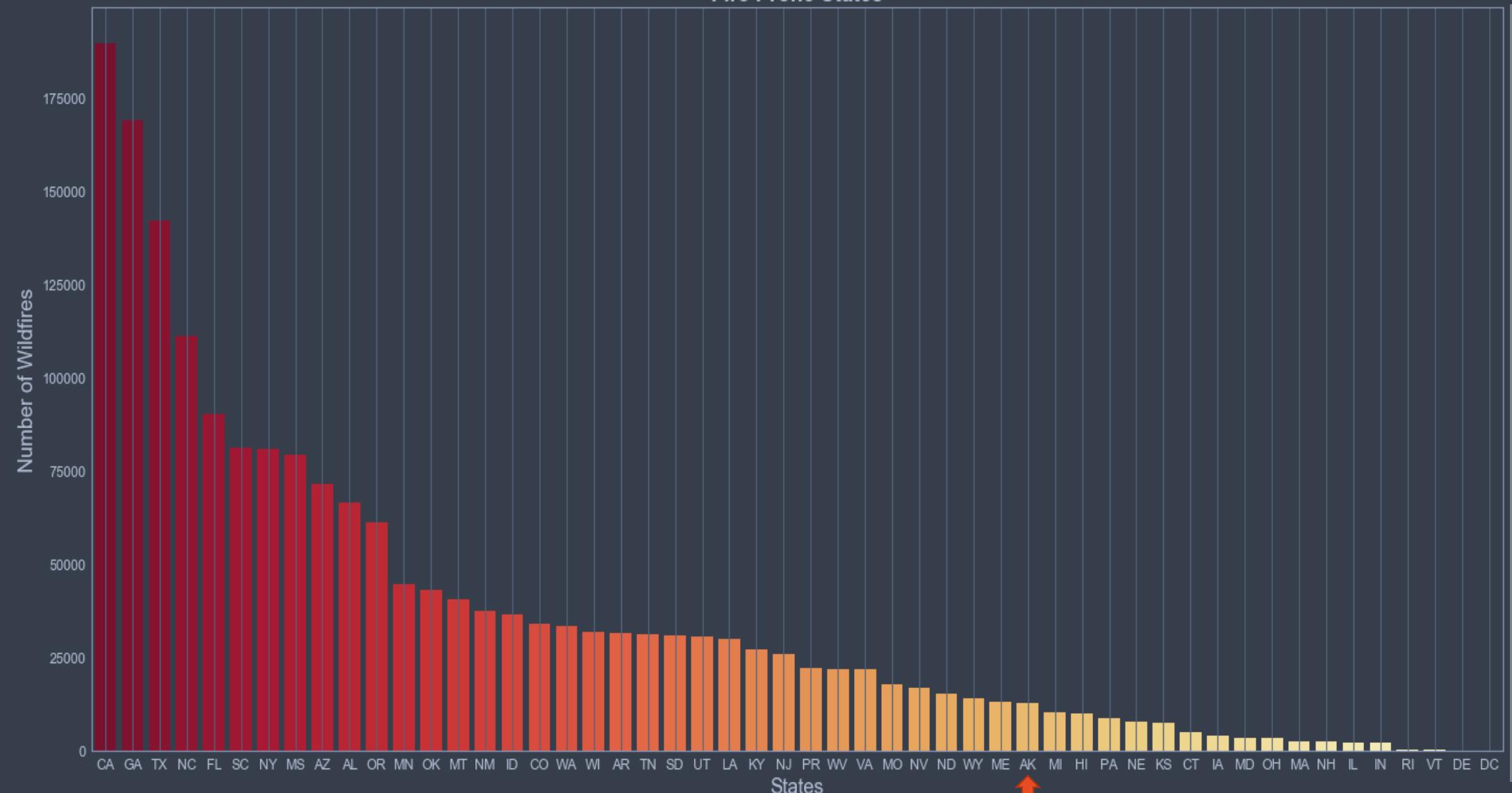
U.S. Wildfire Timeline 2006



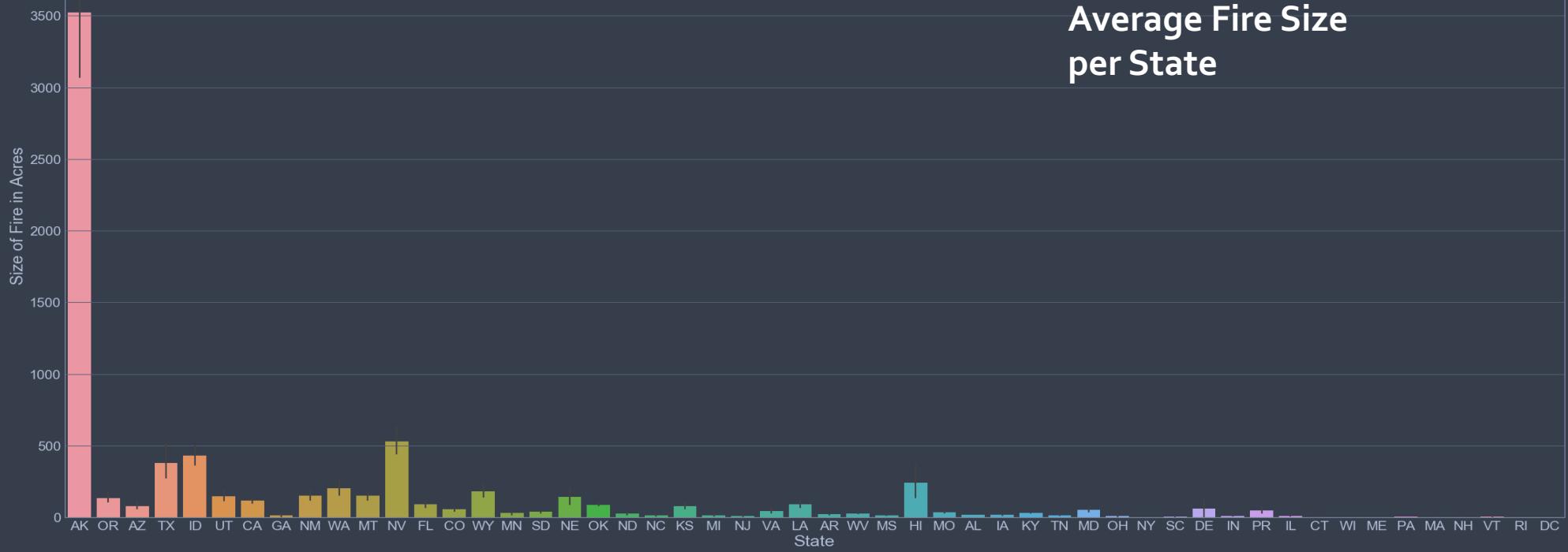
U.S. Wildfire Occurrence Between 1992-2015



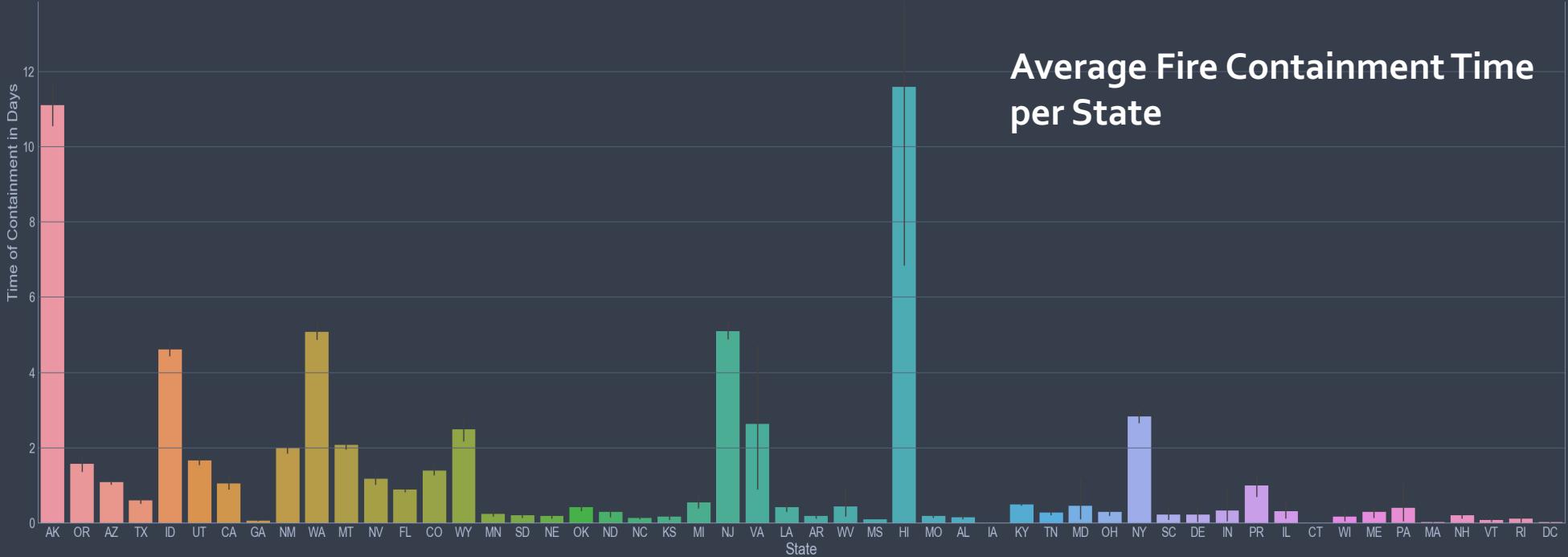
Fire Prone States



Average Fire Size per State



Average Fire Containment Time per State



Can we predict future fires?

Can we predict future fires?

Can we predict future fires?



Predicting the Cause of Wildfires:

Label 1 =
Natural

74% accuracy with natural causes.

Label 2 =
Arson

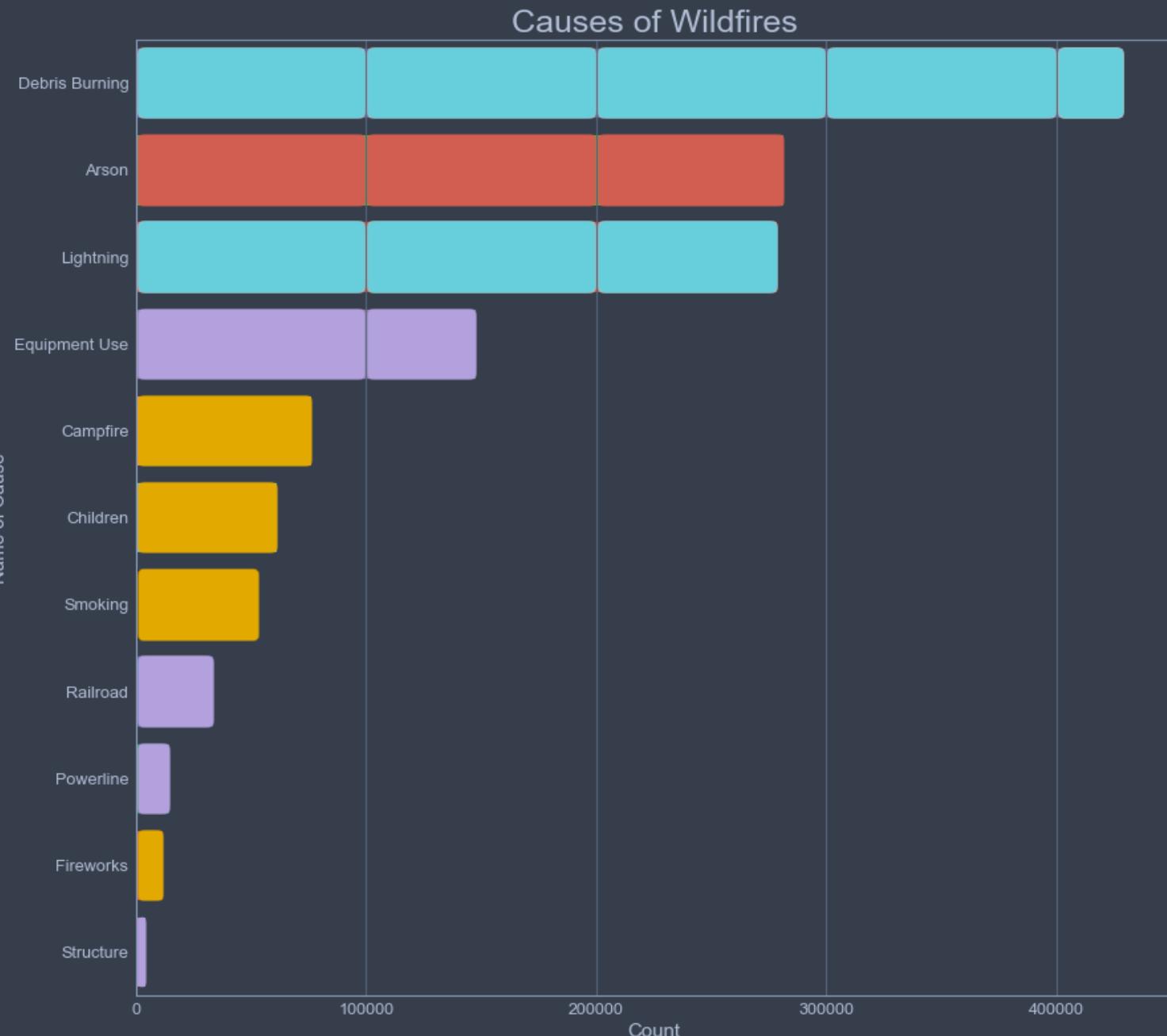
49% accuracy with arson.

Label 3 =
Negligence

24% accuracy with negligence.

Label 4 =
Infrastructure

72% accuracy with infrastructure.

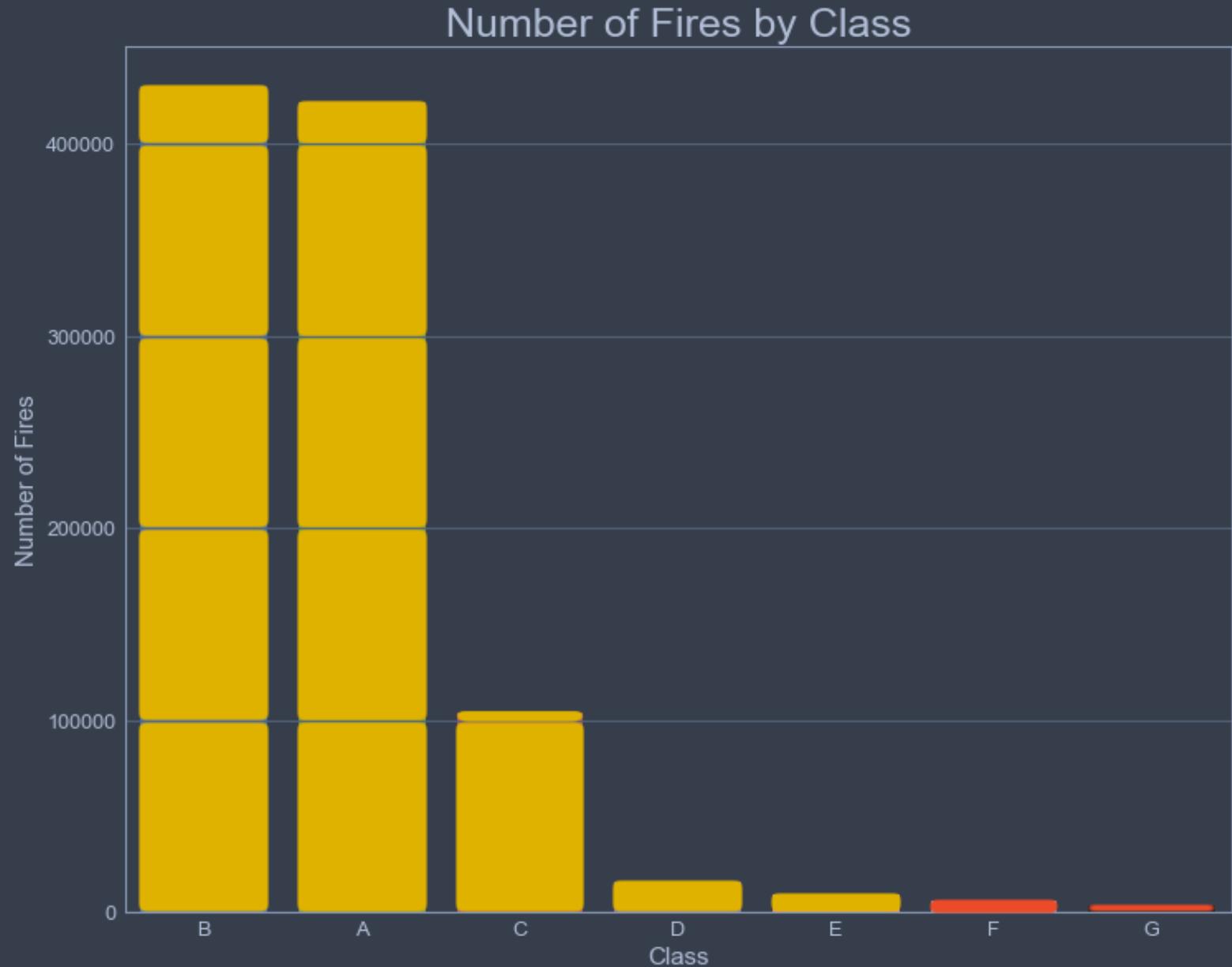


Predicting the Size of Wildfires:

Label 1= *Small Fire, Less than 1,000 acres*

Label 2 = *Large Fire, Greater than 1,000 acres*

64% accuracy with smaller fires.
67% accuracy with larger fires.



What can we do?
What can we do?
What can we do?

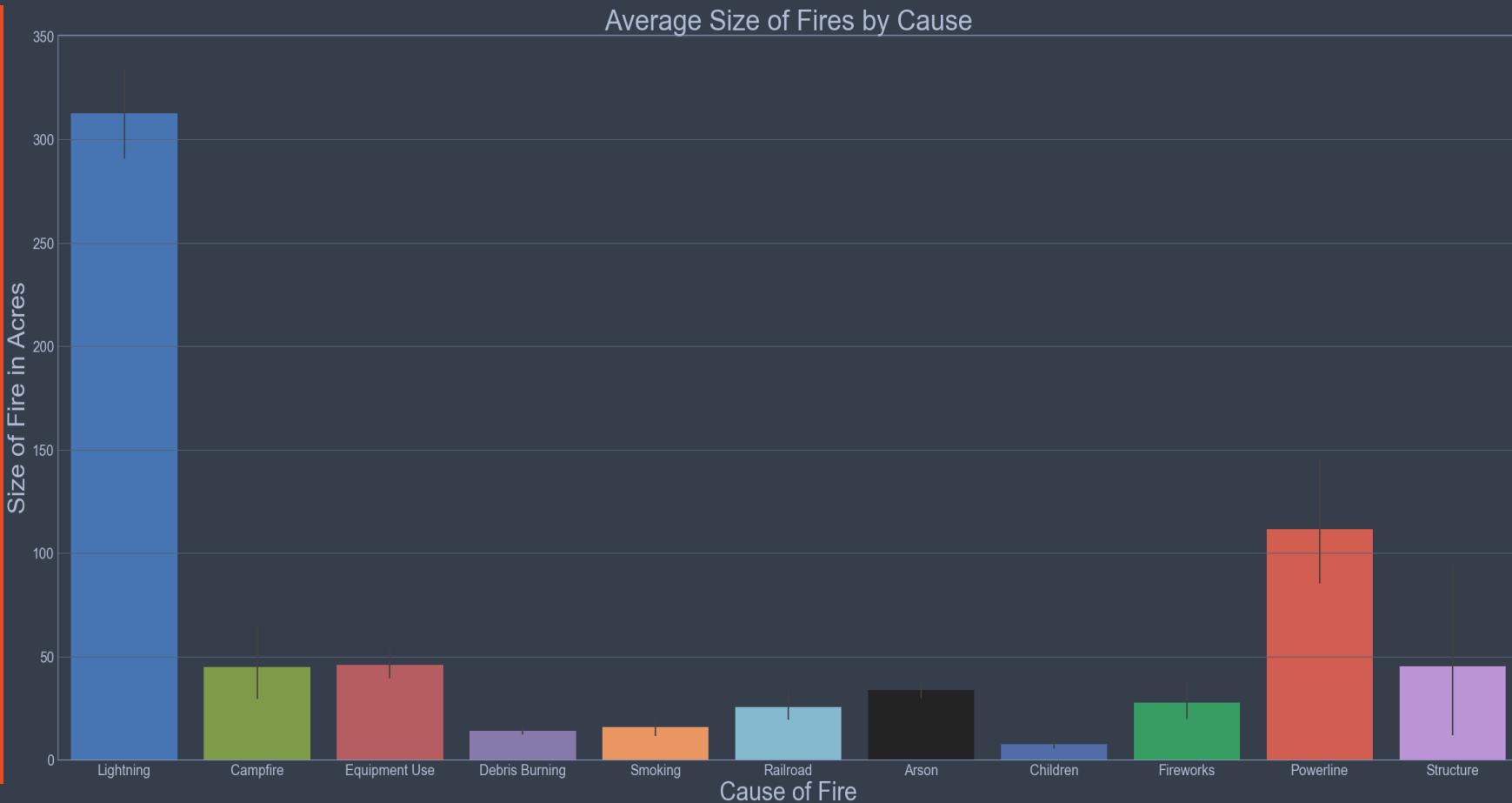


Recommendation 1 : *Replace Faulty Powerlines*

Faulty powerlines result in the 2nd largest average size of fires (in acres).

Rural powerlines cause fires that can't be contained in a quick manner.

Add real-time monitoring techniques to powerlines.



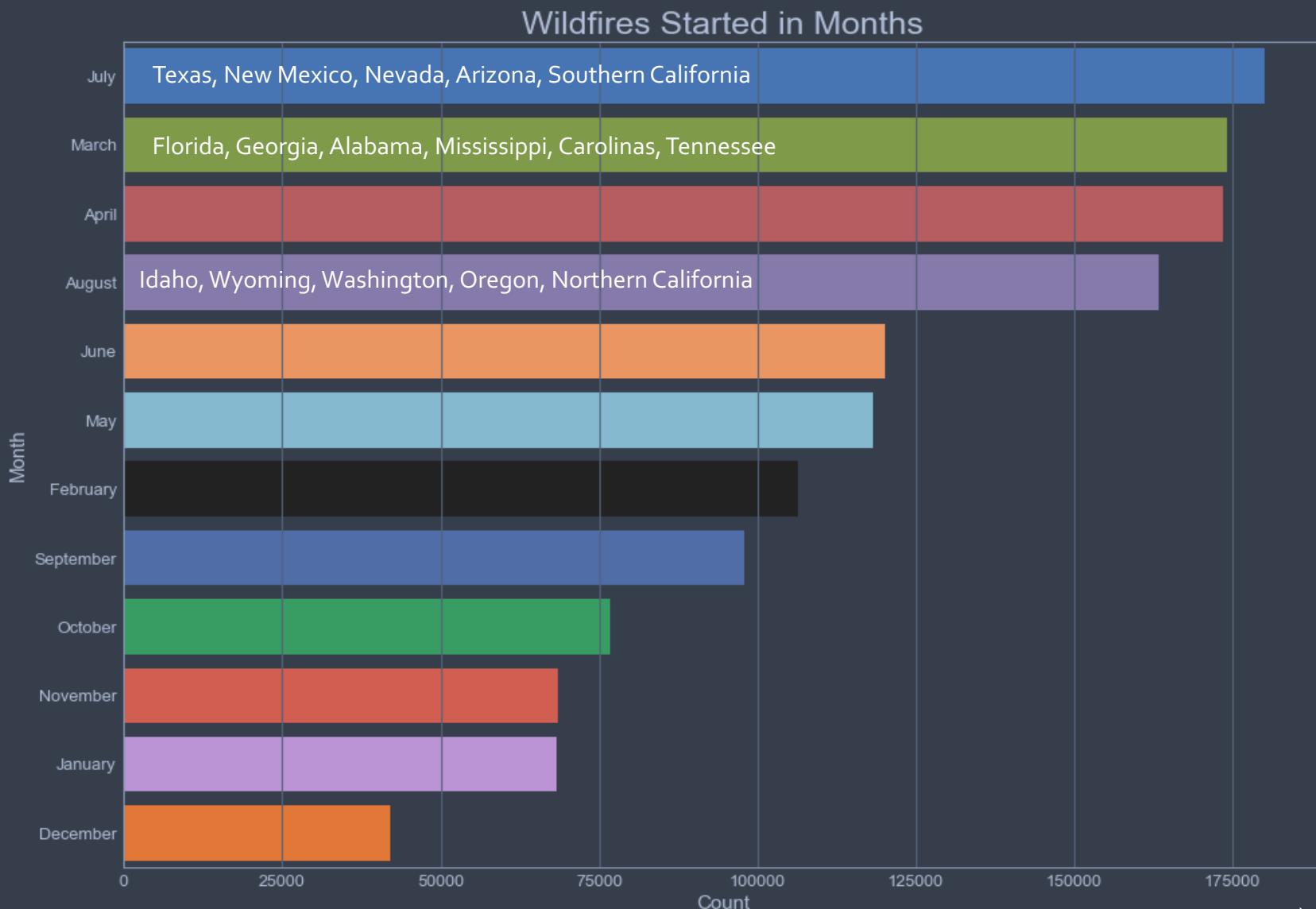
Recommendation 2 : *Allocate Monthly Resources*

Southeastern states = Spring.

Southwestern states = Summer.

Northwestern states = Fall.

Plan equipment and human resources around geographic timelines.

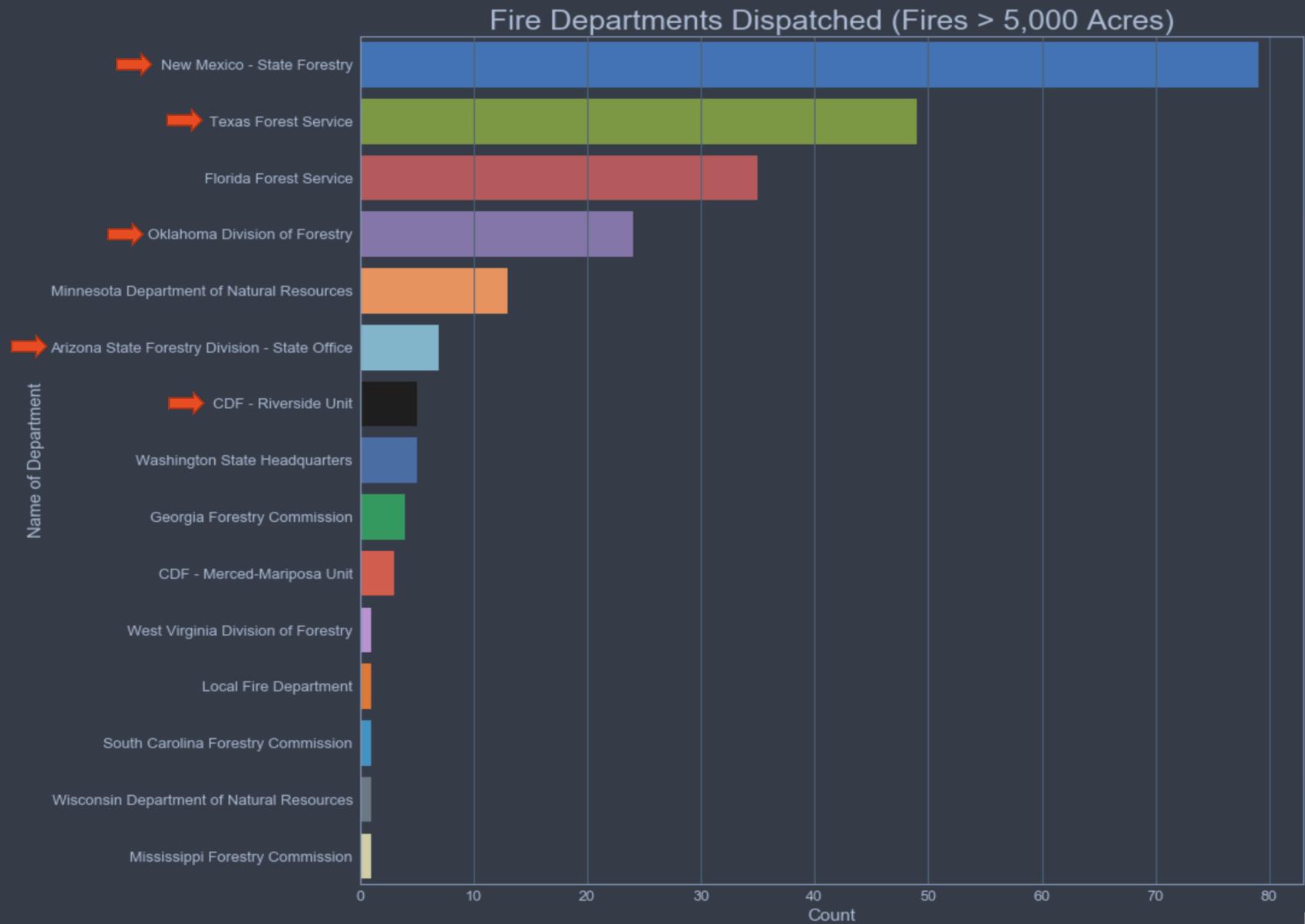


Recommendation 3 : *Help Depleted Units*

These fires are reported with a class 'G' rating.

Southwest units are dispatched more often to fight larger fires.

Over 50% of the largest fires occur in the Southwest.



Conclusions:

- Aim to forecast the future of wildfires in the United States.
- Explore 23 years of data between 1992-2015.
- Build models to predict the size and causes of future wildfires.
- Provide recommendations to prevent and help the suppression of future fires.



If there was more data...

Analyze fire suppression resources.

- *Human Capital*
- *Equipment Costs*



Predict resources needed to fight fires in different locations.

Collect data on monetary and property loss.



Identify if people living in a certain area should buy fire insurance.



THANK YOU!

