

The Economic Impacts of Large Wildfires

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The 2012 wildfire season was one of the worst on record. As firefighters battled record blazes in many states, the fires disrupted the lives of nearby workers, employers, and families. For affected communities, large wildfires can present a mixed bag of positive and negative impacts. Losses in recreation, tourism, forestry, and other natural resource industries may occur with large tracts of burnt land (Kent et al., 2003; Butry et al., 2001). In contrast, the money spent on suppression and support services in the communities can contribute to positive growth in local employment and wages, and support existing local business capacity.

Federal spending on wildfire suppression in the United States has grown since the 1970s as wildfires have grown in size and cost. During the last decade the federal government spent \$1.5 billion annually on wildfire suppression – a 250 percent increase from the decade before (Gebert and Black, 2012). There has been little research on the effect of this growing spending on nearby communities. Our research investigated the impacts of large wildfires and associated spending on the economies located near them.

We looked at 346 wildfires that occurred between 2004 and 2008 and cost more than \$1 million each in Forest Service suppression costs to show how large wildfires affected local economic growth. We also examined where wildfire suppression spending was distributed from a subset of 135 of these large wildfires representing \$1.2 billion

in suppression expenses to determine whether local spending can help mediate the impacts of wildfires. Finally, we explored the factors that influence county capacity for capturing spending locally.

Local Labor Market Impacts During a Wildfire

Both local employment and average wages in affected counties increased when large wildfires occurred. Although the roughly one percent increase in employment and wages appears marginal, it's enough to make a difference in local unemployment rates. These increases suggest that, in the short term, the local economic impacts of large wildfires are positive as employment and wages tended to grow faster than expected given seasonal trends and statewide business cycles. The wildfire effect spills into neighboring economies too. Counties that were not directly hit by wildfire, but were adjacent to wildfires experienced modest increases in both average wages and employment.

Different types of counties experienced different impacts. Greater increases in employment occurred in counties that were economically reliant on recreation and tourism sectors while employment was negatively affected in counties reliant on traditional service sector jobs. Average wages increased over 2.7 percent during periods of wildfire in counties with a large share of federal and state government employment. Our results suggest that employment added during large wildfires may pay differently depending on the sector where it is added. Wages for fire-associated jobs in government sectors, for instance, may grow, reflecting hazard and overtime pay that may not exist in other sectors.

Wildfire has Persistent Effects on the Economy

Although the short-term effects of wildfires on local economies are generally positive, in the medium to longer-term, local economies experienced increased volatility in employment and average wages. Wildfires tended to amplify existing seasonal economic patterns, reducing local economic stability in communities for a year or two after the fire. Similar to other natural disasters (Belasen and Polachek, 2008; Ewing et al., 2009), large wildfires create more drastic seasonal patterns in the years following the event. Although increased employment and wages during wildfires will not likely negate these longer-term impacts, they may indicate increased local capacity to contribute to suppression activities and adapt to growing wildfire risk.

The Effects of Local Spending

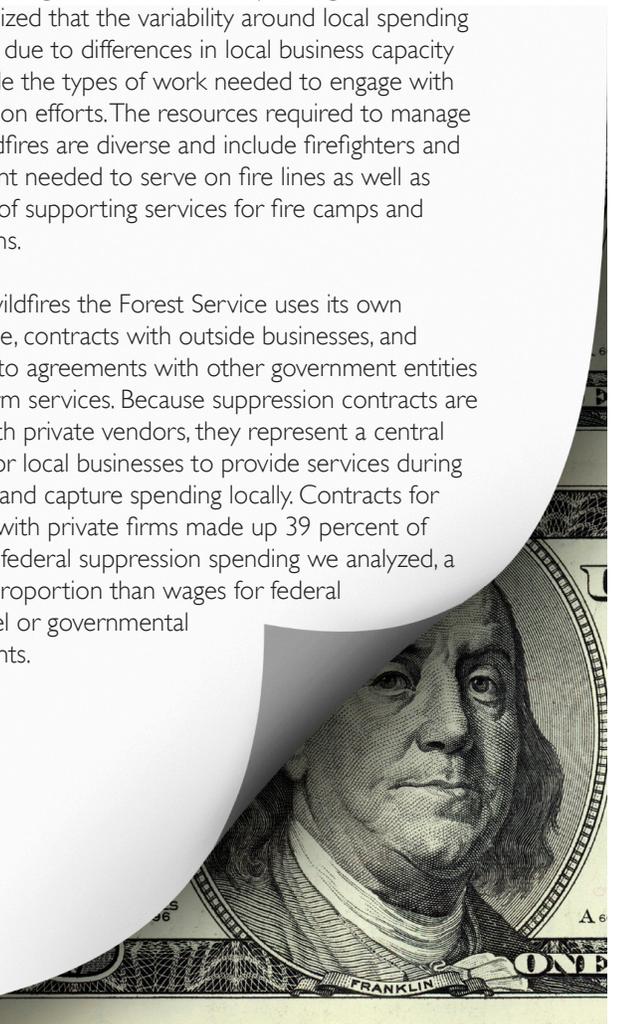
The people, equipment, and skills involved in suppression work may come from nearby communities or from locations much farther away. Overall, just nine percent of all suppression spending in our sample of 135 wildfires was spent in the county of the fire. Between fires, local spending varied from zero to 39 percent of the total fire cost. While the large majority of fires had less than five percent local spending, a handful had more than twenty percent.

After examining where wildfire suppression money was distributed we found that local economic growth was significantly influenced by the amount of suppression expenses spent in the county of the fire. On average, for every million dollars spent locally, local employment increased one percent. In contrast, the total cost of the fire had no effect on the local economy suggesting that local suppression spending is a better indicator for estimating local economic impacts.

What Determines How Much Local Spending Occurs?

This is an important question that arises from understanding the effect of local spending. We hypothesized that the variability around local spending might be due to differences in local business capacity to provide the types of work needed to engage with suppression efforts. The resources required to manage large wildfires are diverse and include firefighters and equipment needed to serve on fire lines as well as an array of supporting services for fire camps and operations.

During wildfires the Forest Service uses its own workforce, contracts with outside businesses, and enters into agreements with other government entities to perform services. Because suppression contracts are made with private vendors, they represent a central avenue for local businesses to provide services during wildfires and capture spending locally. Contracts for services with private firms made up 39 percent of the total federal suppression spending we analyzed, a greater proportion than wages for federal personnel or governmental agreements.



Suppression contracts provide potential opportunities for local contractors in sectors that vary from traditional natural resource services to housekeeping and utility services. While some of the highest paid vendors in our sample of wildfires provided line crews and suppression equipment, others provided food catering, janitorial, and other base-camp set up or support services. Whether a community has the capacity to provide some of these services or whether a community's ability to participate is quickly outpaced may explain whether more suppression spending is awarded locally.

Local Capacity to Capture Suppression Contracts

Similar to overall local spending, local capture of suppression contracts varied greatly between fires, from zero to 62 percent of the total contracted cost per fire (see Figure 1), suggesting that some counties are more adept in capturing suppression contracts locally than others.

We identified two factors that significantly affected how much contract spending was captured locally. First, the number of federal vendors in the county that have performed services in the past associated with large wildfire occurrences influenced the amount of money captured locally during large wildfires. Counties with more vendors captured a higher proportion of the suppression contract spending. In addition, we also found that counties with a greater number of vendors exhibited greater variability in the amount of suppression contracting captured locally, indicating that the number of vendors is a necessary but not sufficient condition for local capture.

Second, we found that the underlying composition of the local economy affected local capture. Counties with diverse and broad-based economies captured the most contract spending, while counties with more narrow economic specializations, including specializations in services, government, and farming all had lower rates of local capture.

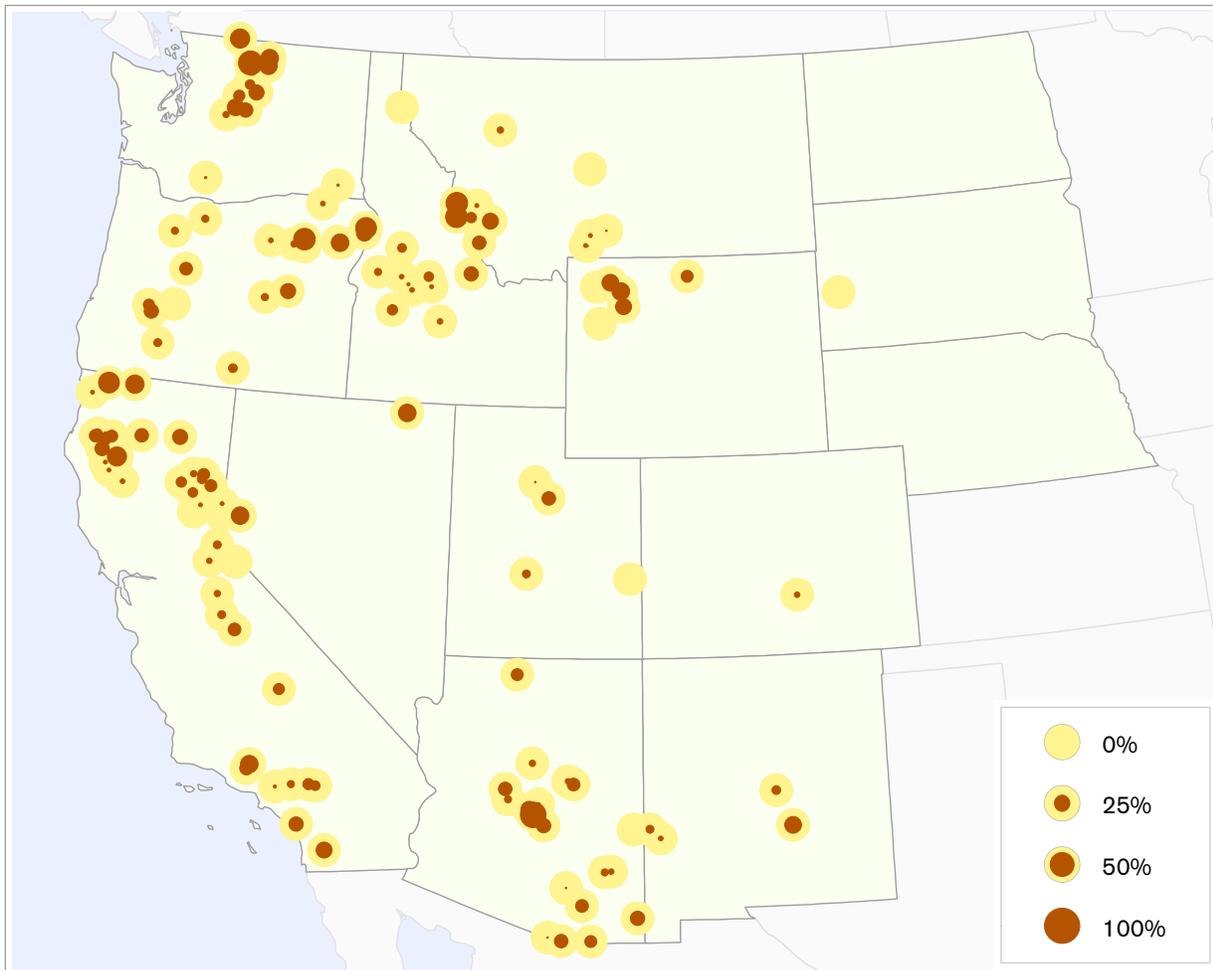


FIGURE 1. LOCAL CAPTURE OF SUPPRESSION CONTRACTS. MAP BY BRANDEN RISHEL, ECOSYSTEM WORKFORCE PROGRAM.

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The number of relevant vendors and local economic specialization can be seen as measures of contracting capacity. Local economic specialization influences the types of business present in the county, and counties that have more and diverse suppression-related businesses interfacing with the federal government have more resources for federal suppression work. Together, these two factors accounted for 62 percent of the variance in local capture. Our research suggests that although there are other factors at play, underlying economic structure and the number of vendors with a history of interfacing with the federal government is important predictor of how local economies experience large wildfires.

Conclusion

Similar to other natural disasters, large wildfires create short-term disruptions and longer-term instability to local economies. How the Forest Service spends suppression money, however, greatly influences how a community experiences a fire. Our research demonstrates that local spending of suppression money can help to at least partially mitigate some negative impacts through an initial burst of spending that creates positive economic gains.

In order to realize these benefits, local businesses and workers must be prepared to participate in wildfire

suppression efforts. Although overall a small portion of spending occurred locally in our sample of fires, some communities were able to capture much more of the spending than others. A greater array of vendors that have contracted with the federal government in the past predicts greater local economic benefits when wildfires happen. In natural resource sectors, this finding highlights the importance of an active local base of businesses capable of performing services like hazardous fuels reduction, thinning, and other services that can easily be translated into wildfire suppression services when needed.

Wildfires will continue to affect the western United States each year and the communities located near them. As federal spending on suppression continues to grow, an understanding of the effects on local economies will help natural resource managers, policymakers, and communities better anticipate and make management and policy decisions that support local economies. 🌲

Acknowledgments

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