

Modeling Wildfire Impacts for Preparedness Planning

Assessing Wildfire Threat, Economic Exposure and ROI for Mitigation Planning

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Abstract

In the 2007 fire season, San Diego County alone saw 360,000 acres burned, over \$1 billion in losses, more than 1,200 homes destroyed, many buildings and critical infrastructure lost, as well as significant amounts of commodity agriculture ruined. Suppression costs at the federal level have surpassed \$1 billion annually for the past several years and state and local costs are believed to be more than double that.

The consequence of wildfires has never been greater as more and more people move into wildfire prone areas. The Wildland Urban Interface (WUI) has been a combat zone for wildfires— with significant potential social, economic and environmental impacts. Fire professionals in all agencies are challenged to reduce the risk of wildfire in the WUI, while balancing tight budgets for preparedness planning, response, suppression and rehabilitation.

It is clear that there is an increasing need for fuel treatments, mitigation planning, prevention awareness and recovery preparedness to reduce wildfire risk and impacts to communities in the WUI. But where is the greatest risk? What are the potential economic, social and environmental impacts? What and where are mitigation actions most needed? How can alternatives be quantified, compared and prioritized? Are we spending our budgets effectively and efficiently?

This article focuses on the utility of geo-technology, map analysis procedures and web-based visualization and delivery options in addressing these questions to not only identify areas of greatest jeopardy, but to quantify the dollar impact of wildfire loss and proposed mitigation efforts. This includes development of the following distinct phases: 1) *Wildfire Threat* defining the probability of a wildfire occurring based on the integration of fuels, terrain characteristics, historical weather and ignition data with fire behavior models, 2) *Wildfire Risk* defining those areas with the greatest potential for being impacted by a fire, 3) *Community Wildfire Protection Planning* that identifies highly vulnerable communities and provides the required risk data for development of mitigation plans, 4) *Economic Exposure* identifying estimated loss by integrating threat with economic data, and 5) *Return on*

Investment for evaluating different mitigation alternatives for preparedness planning. The assessment methodologies can be applied at both strategic and tactical scales, not only to provide the basis for more informed decision making but as a consistent basis for funding allocation. This presentation will demonstrate prototypes developed for the County that integrate wildfire risk data with values data to quantify economic impacts in support of mitigation planning efforts.

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