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San Diego Wildfires of 2003 and 2007 Offer Lessons

The 2003 and the 2007 wildfires in San Diego County were remarkably similar in their causes, impacts and the human responses they elicited. Particularly alarming is the observation that these fire events are not new to the region, as large fire events have occurred historically. A scientific review of these events is presented in Chapter 5 of *Natural Disasters and Adaptation to Climate Change*, by Cambridge University Press.

Essentially every year, in all counties in the southern California region, there are fires that range in size from 1,000 to 10,000 ha. Although these conditions occur periodically under other climatic regimes, the Mediterranean-type climate results in such conditions annually. Massive fires more than 50,000 ha in size, similar to the 2003 and 2007 fires, have occurred nine times since the earliest date for which there are records, in 1889.

One reason the southern California region was especially vulnerable to massive fire events in 2003 and 2007 is the extraordinarily long antecedent droughts. The droughts' likely effect was to produce significant amounts of vegetation dieback, which greatly increased ignitions from flying embers downwind of the fire front. This contributed to extraordinarily rapid fire spread that in many cases exceeded firefighters' capacity for defending homes. However, the resilience of urban communities to the 2003 and 2007 wildfires was largely a function of their location and spatial arrangement. At a landscape scale, homes that burned were distributed in areas that have been historically fire prone and in areas that were located farther inland. Homes at low to intermediate densities and in smaller, isolated neighborhoods were also more likely to be burned. Homes on the interior of developments or on the leeward side largely survived untouched.

There is evidence that most of the homes lost in 2003 and 2007 ignited from embers blown from the wildland to the urban environment. By evaluating prefire images of homes on the perimeter of neighborhoods, it was determined that trees overhanging homes were a significant factor in whether or not a home burned — likely tied to the accumulation of leaf litter on rooftops, which is ignited by wind-blown embers.

Management Implications

- Large fire events are an inevitable and inescapable part of living in southern California, but as scattered patterns of development continue to extend into the most flammable parts of the landscape, it becomes more and more difficult for firefighters to defend every home.
- Land use planning is very likely one of the more important avenues for reducing losses from wildfires, because location and pattern of housing significantly influence where fires occur and, in turn, where fires are most likely to result in losses.
- Most information on the types of construction and landscaping necessary to fireproof a house is of an anecdotal nature, and there is an urgent need for science-based approaches and data.

THIS BRIEF REFERS TO:

Keeley, JE, AD Syphard, CJ Fotheringham. 2013. Ch. 5: The 2003 and 2007 wildfires in southern California. p42-52 in: Boulter, S, J Palutikof, DJ Karoly, D Guitart (eds.). *Natural Disasters and Adaptation to Climate Change*. Oxford: Cambridge University Press. 304p.

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4971>
<http://www.werc.usgs.gov/socalfirerisk>



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Scientific analysis of the 2003 and 2007 fires may yield new perspectives on the horizon for wildfire management in San Diego County.