

Modeling Multiple Ignition Scenarios for Assessment of Firefighting Strategies

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Abstract:

Modeling fire spread in cities is a basic requirement for preparedness and response to multiple ignition scenarios, which may occur following wild-land fires, earthquakes, wars, industrial catastrophes, etc. Existing models were developed for countries where the majority of constructions are highly flammable, such as US and Japan. In contrast, in Mediterranean and Middle Eastern (MME) cities, almost all construction is non- flammable whereas the space between constructions is covered by highly-flammable vegetation, of which a significant portion is men-planted. I develop a spatially explicit city- scale model of fire spread as well as of the firefighters' response for MME cities and implement it to a study area in Haifa, Israel. The model reveals that unlike US or Japan, fire spread in MME cities is highly sensitive to spatial patterns of urban vegetation. The model will assist firefighters, municipalities and foresters to mitigate the danger of multiple ignition scenarios and will allow them to execute more effective responses.