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## Forest Fire Modeling and the Effect of Fire-Weather in Landscape Fire Behavior for the Region of Attica, Greece

### Abstract

The knowledge of meteorological conditions is critical for the description of fire weather. In this paper, the mesoscale numerical meteorological model RAMS has been used to simulate the surface wind and temperature in two fire events in the region of Attica in Greece. The FARSITE (Fire Area Simulator) fire model, for the description of forest fire behavior, taking into consideration the influence of fuels, topography and weather conditions. The accuracy of the results was evaluated and confirmed that the use of suitable fuel models is very important for achieving reliable simulations for the devastating fires.

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N. Iliopoulos, K. Kalabokidis, G. Kallos, H. Feidas, A. Malounis, and E. Mavromatidis

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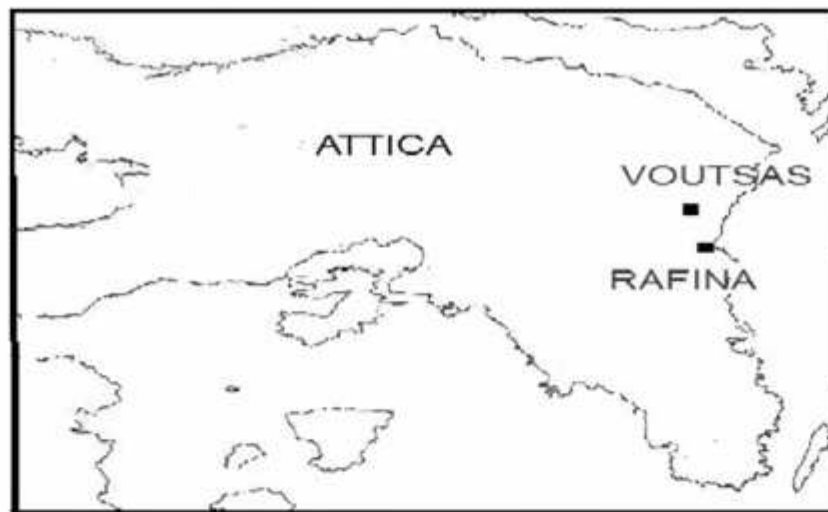
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**Fig. 1** Attica region in Greece

## 1 Introduction

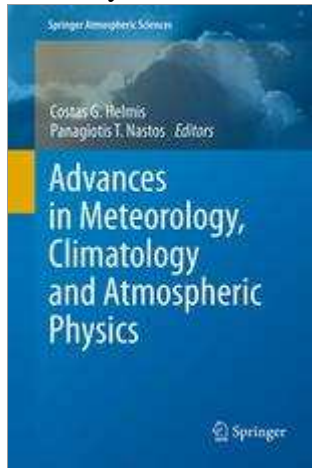
Forest fires have been a very common phenomenon in Mediterranean climates for years. The change in land utilization in the Mediterranean has increased the frequency of destructive fires (Piñol et al. 1998). In Greece, Attica (Fig. 1) is one of the regions that are influenced by the increase in fire frequency. In this work we use the numeral meteorological model RAMS (Regional Atmospheric Modeling System) to simulate the wind factor and the surface temperature as well as their temporal change for the period 25–30 July 2005. The meteorological data that arise can be the input in a fire model such as FARSITE (Fire Air Simulation) for the description of the behavior of forest fire. More specifically two forest fires in Rafina and Voutsas in Eastern Attica on 28th July 2005 are simulated by FARSITE, taking into consideration the effect of fuel, using different fuel models, the terrain and the weather conditions.

## 2 Methodology

### 2.1 Climatic Conditions: Vegetation

Rafina and Voutsas (Fig. 1), the places where big forest fires broke out on 28th July 2005, have a distance of 28 km and are located in Eastern Attica in Greece (N: 38° 01', E: 24° 00'), 100 m above sea level. Eastern Attica is characterized by the typical dry Mediterranean climate. It does not rain most of the times except for the autumn and winter months. The total yearly rainfall is 397 mm, the average yearly temperature is 17.3°C but during the summer period the average maximum temperature reaches 30.9°C according to the climatic data of the 1986–1997 period, which were

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Citations

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3. Outcome
4. Conclusion
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## Related Content



## References (8)

1. Andrews PL (1986) BEHAVE, fire behavior prediction and fuel modeling system-BURN subsystem, Part 1. USDA Forest Service, Intermountain Forest and Range Experiment Station, General Technical Report INT-194, Odgen, UT
2. Bachisio A, Duce P, Laconi M, Pellizzaro G, Salis M, Spano D (2007) Evaluation of FARSITE simulator in Mediterranean maquis. *Int J Wildland Fire* 16:563–572. doi:dx.doi.org/10.1071/WF06070 CrossRef
3. Ludwig JA, Reynolds JF (1988) *Statistical ecology: a primer on methods and computing*. Wiley, New York
4. Mitsopoulos ID, Dimitrakopoulos AP (2006) Canopy fuel characteristics and potential crown fire behavior in Aleppo pine (*Pinus halepensis* Mill.) forests. *Ann For Sci* 64:287–299. doi:10.1051/forest:2007006 CrossRef
5. Pielke RA, Cotton WR, Walko RL, Tremback CJ, Lyons WA, Grasso LD, Nicholls ME, Moran MD, Wesley DA, Lee TJ, Copeland JH (1992) A comprehensive meteorological modeling system rams. *Meteorol Atmos Phys* 49:69–91. doi:10.1007/BF01025401 CrossRef
6. Piñol J, Terradas J, Lloret F (1998) Climate warming, wildfire hazard, and wildfire occurrence in oastal eastern Spain. *Clim Chang* 38:345–357. doi:10.1023/A:1005316632105 CrossRef
7. Rothermel RC (1972) A mathematical model for predicting fire spread in wildland fuels. Res. USDA Forest Service, Intermountain Forest and Range Experiment Station. Pap. INT-115, Odgen, UT
8. Scott JH, Burgan RE (2005) Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. US Department of Agriculture, Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-153, Fort Collins, CO

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