

ATMOSPHERIC MESOSCALE SIMULATIONS OF REGIONAL WILDLAND FIRE EPISODES: LOOKING FOR WEATHER-RELATED FACTORS AND SCALES OF INTERACTION

Brian E. Potter¹

The Regional Atmospheric Modeling System (RAMS) is a sophisticated computer model for the simulation of atmospheric processes on scales from a county to a country. It can accurately represent winds, air moisture, and air temperature. In the study of fire-weather episodes, this information must somehow be translated into an estimate of fire risk. We performed statistical analyses of eight meteorological variables on fire days and nonfire days, and found that dewpoint depression differs between the two types of days throughout the United States (except Hawaii). By adjusting dewpoint depression for the surface elevation at a particular site, this measure of humidity becomes a fire-weather index that RAMS can easily compute. The model can subsequently produce maps showing the distribution of this fire-weather index at user-specified intervals for simulation of wildfire episodes. This new index serves as a useful tool for examining how large-scale atmospheric processes influence the development of regional weather systems conducive to fire occurrence.

¹USDA Forest Service, North Central Forest Experiment Station, East Lansing, MI 48823-5290.