A GEOGRAPHIC INFORMATION SYSTEM METHOD FOR FIRE MANAGEMENT IN THE WILDLAND-URBAN INTERFACE: IDENTIFYING CRITICAL FIRE DANGER AREAS

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ABSTRACT

A Geographic Information System (GIS) is being used to create a wildland-urban interface risk, hazard, and value assessment model. GIS layers being developed include: topography, land use, fuel, weather, fire histories, and natural values. Areas of greatest risk (exposure to ignition), hazard (potential to burn), and value will be identified and coupled with fire behavior predictions to simulate fire intensity and spread.

The project can increase awareness of fire danger and interface living by identifying problem areas and illustrating techniques of wildfire hazard reduction through landscape manipulation and the use of proper building materials. Local officials can use the model in planning, zoning, and fire ordinance development. State and federal land management agencies will be able to prioritize areas for presuppression mitigation efforts, such as hazard fuels reduction, green stripping, etc. The database can then be incorporated into all agency systems for continual updating and application.

INTEGRATED REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEM (GIS) METHODS FOR ESTABLISHING WILDFIRE PRESCRIPTIONS IN SELECT REGIONS OF THE SOUTHWESTERN U.S.

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ABSTRACT

Remote sensing and Geographic Information System (GIS) methods may facilitate formulation of wildfire prescriptions. Such technology has the potential to increase our understanding of past and future fire behavior, and to assist wildland fire management and wildfire management activities. The goal of this study is to map fire effects and associated vegetation complexes and topography, in order to assist the U.S. Forest Service (USFS) with current wildland fire planning efforts.

GIS is used to analyze Landsat Thematic Mapper (TM) data, and Digital Elevation Models (DEMs) in southern Arizona and New Mexico. The DEMs are used to produce terrain classifications. Pre- and postfire TM data are analyzed in conjunction with the terrain classification in order to better understand the linkages between geographic variation in landscape properties and corresponding fire effects. Fire effects and perimeters are mapped using image enhancement techniques. GIS is used to compare the results of this analysis to digitized field maps produced by the USFS at the time of the fire.