Data and Models to support Fire and Fuels Management Decisions

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Fire played a significant role in the development of pre-Columbian vegetation in the Eastern United States. Agriculture, grazing, timber harvesting, urbanization and the introduction of exotic species have altered that role. In many areas land managers desire to restore fire to accomplish habitat improvement and bioconservation goals. In other areas fuels need to be managed to minimize the threat of uncontrolled wildfire. And fire managers need to safely and effectively manage wildfires. To accomplish these goals managers need better data and models describing fuels and fire behavior potential. LANDFIRE is a program to provide managers with data and analytical tools to accomplish fuels treatment and restoration activities. LANDFIRE will deliver a comprehensive suite of geospatial products, computer models and utilities for the entire U.S., including vegetation, environmental, fire and fuel risk layers. Multiple Landsat-7 ETM+ scenes, biophysical and gradient modeling and reference plot data are used to classify vegetation and derive fuels information. Existing state and federal agency vegetation plot data, particularly Forest Inventory Analysis (FIA), are supplemented with new data where needed providing the project with exceptionally high spatial coverage of existing vegetation.

LANDFIRE integrates existing data bases, e.g., terrain and soils (STATSGO) as well as creates numerous original ones, approximately 100 data layers in all. Twenty-four primary layers will be publicly available, distributed on an U.S. Geological Survey webbased seamless server. Vegetation layers include cover type, structural stage, canopy cover, and canopy height. Environmental layers include 18-year daily weather and biophysical setting. Fuel and fire risk layers include fire regimes, fire regime condition class (FRCC), and fire behavior and effects fuel models including crown fuel models and 40 new FARSITE/BEHAVE-Plus fire behavior fuel models. Computer models include WX-BGC a biogeochemical simulation model, LANDSUM a landscape fire succession model, and FIREHARM a fire hazard rating model. The methods used to create these data layers are outlined with particular reference to the Eastern Prototype map zone. The unique spatial scale and wall-to-wall coverage of LANDFIRE data provide opportunities for additional scientific investigations and the development of decision support tools. Potential research and development topics are discussed.