

ENHANCED WILDLAND FIRE MANAGEMENT DECISION SUPPORT USING LIDAR-INFUSED LANDFIRE DATA

B. Peterson^{a,*}, W.M. Jolly^b,

^a ASRC Federal InuTeq, contractor to U.S. Geological Survey (USGS), Earth Resources Observation and Science (EROS) Center, Sioux Falls, SD 57198, USA – bpeterson@usgs.gov

^b U.S. Department of Agriculture Forest Service Fire Sciences Laboratory, Missoula, MT 59808, USA – mjolly@fs.fed.us

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ABSTRACT:

Wildfire is an important component of many ecosystems. Understanding the behavior and impacts of wildfire is critical for land managers. To predict and analyze fire behavior, accurate information about three-dimensional canopy structure and wildland fuel across the landscape is necessary. While many remotely sensed data are invaluable for assessing these canopy characteristics over large areas, lidar data in particular are uniquely suited for quantifying three-dimensional canopy structure. However, the use of lidar to derive the required canopy fuel data is still relatively limited. This observation can largely be attributed in part to two underlying issues. First, within the United States, the LANDFIRE program has become the default source of large-scale fire behavior modeling inputs because it provides consistent, nationwide data regarding the distribution of vegetation structure and canopy fuels across the landscape. However, the LANDFIRE program does not currently incorporate lidar because they are not consistently available for the entire country. Second, where lidar data are available, these data are underutilized for fire behavior applications, partially because of a lack of local personnel trained to process and analyze lidar data. Our project addresses both of these issues by developing the Creating Hybrid Structure from LANDFIRE/lidar Combinations (CHISLIC) tool. CHISLIC automatically generates a suite of vegetation structure and wildland fuel metrics from lidar data and infuses these into existing LANDFIRE data sets. CHISLIC thereby ensures: 1) vegetation and fuels maps based on the best data available, and 2) data continuity through the linkage with the LANDFIRE program. Here, we will describe the methods used within CHISLIC to derive key vegetation canopy characteristics from airborne and space-based lidar observations. We will also show early results indicating how CHISLIC will provide beneficial data to land managers so they can better understand and manage wildland fire.

* Corresponding author. This is useful to know for communication with the appropriate person in cases with more than one author.