

LANDFIRE Product Application Summary

Probabilistic assessment of wildfire hazard and municipal watershed exposure

Citation

Scott, Joe, Don Helmbrecht, Matthew P. Thompson, David E. Calkin, and Kate Marcille. "Probabilistic assessment of wildfire hazard and municipal watershed exposure." *Natural Hazards* 64:1 (2012): 707-728.

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Application Location 45°12'59.85" N 112°38'20.13" W (Watersheds around Dillon, MT.)

Objective

Use spatial analysis and burn probability modeling to assess the potential of wildfires in 10 Montana municipal watersheds.

Project Description:

Because of potential erosion, sediment redistribution and flooding, wildfires pose a significant risk to municipal water supplies. Scott et al. (2013) use spatial analysis and burn probability modeling to assess the potential of wildfires in 10 Montana municipal watersheds.

In general the authors used the model FSim large-fire simulator which requires spatial data representing terrain, fuel and vegetation characteristics. The team used a mix of off-the-shelf terrain and adjusted LANDFIRE vegetation data. The terrain and vegetation data were then used to create fuels data. Specifically, the team used:

1. Off-the-shelf, LANDFIRE version 1.0.0 (LANDFIRE "National"):
 - a. slope, elevation and aspect
 - b. Biophysical Settings, Existing Vegetation Type (BpS and EVT)
 - c. Existing Height and Cover (EVH and EVC) of shrub and grass life forms.
2. Adjusted: EVC of forest life form (reduced cover of version 1.0.0)
3. Created using expert rule sets and LANDFIRE data: surface and canopy fuels, canopy bulk density (also used LANDFIRE's Reference Database)

4. Additionally-used recent fire and beetle outbreak data to modify relevant data as needed.

Results of the project

The modeling efforts generated several maps including burn probability, mean fire line intensity and integrated wildfire hazard that may be used by managers to prioritize forest restoration efforts.

LANDFIRE products used

A mix of off-the-shelf terrain studies and adjusted LANDFIRE vegetation data

Value of this work to the natural resource management/conservation community

- Research demonstrates savvy use and modification of existing datasets, then creation of new data
- Authors developed novel and repeatable method for assessing potential fire risk to water supplies, and
- Research results give managers of the mapped/modeled watershed direct information that can help prioritize restoration activities.

Additionally:

- Unique use of LANDFIRE data to assess fire threat to ecosystem service of municipal water
- Methods are transferrable to other regions
- Authors offer specifics on modifying LANDFIRE data for local use

Online resources

Paper available via Google Scholar or this link:

<http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/34353/MarcilleKateForestryProbabilisticAssessmentWildfire.pdf?sequence=1>

Visit <http://www.landfire.gov/vegetation.php> for LANDFIRE vegetation data and <http://www.landfire.gov/fuel.php> for LANDFIRE fire and fuel behavior data



Figure 1. Analysis area overlay by Randy Swaty using Google Earth Pro, Nov. 2013