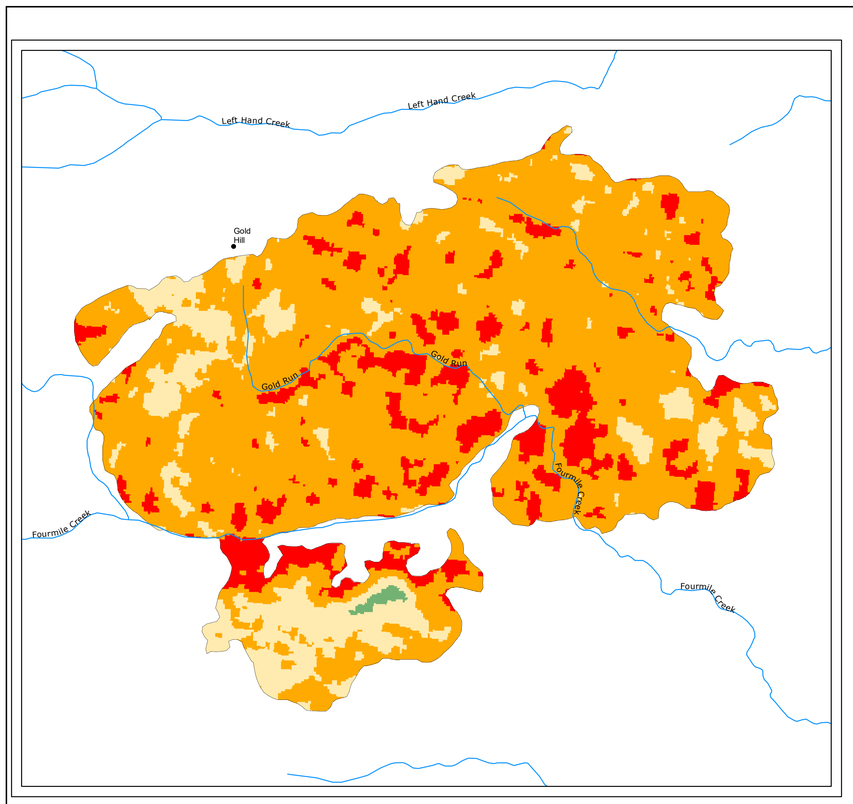
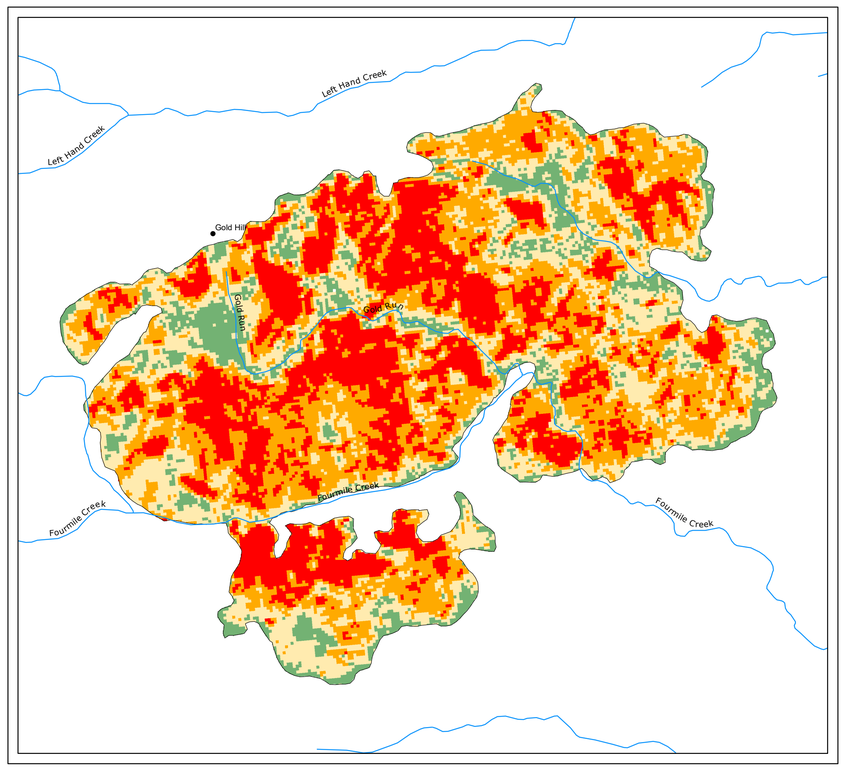
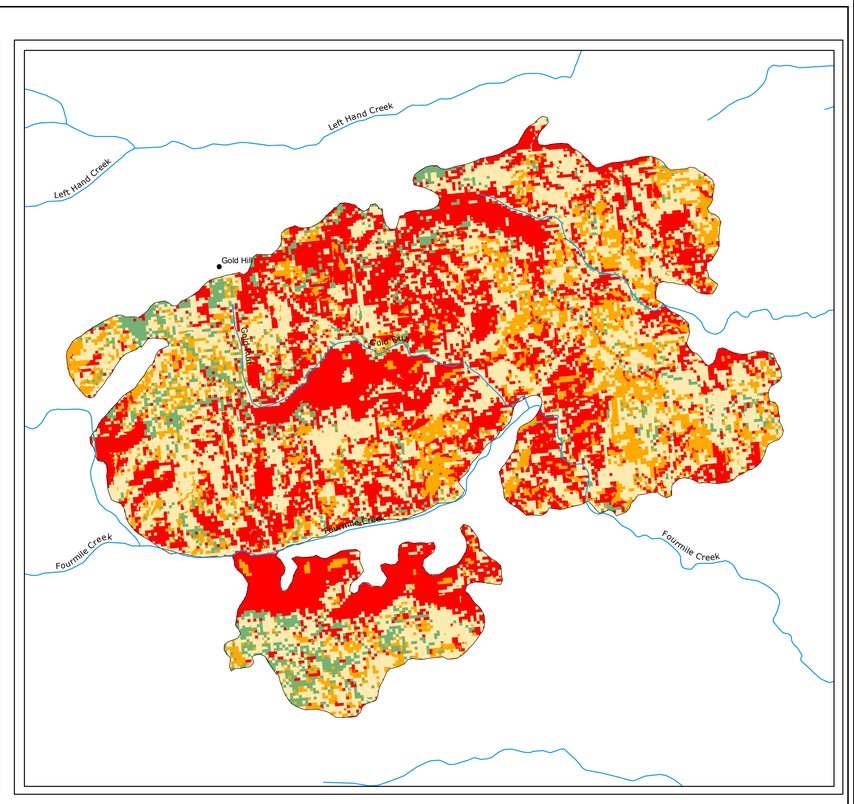
Dynamic Wildfire Modeling in Colorado



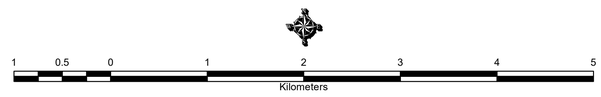
Fourmile Canyon Fire COWRAP Method



Fourmile Canyon Fire MTBS Method



Fourmile Canyon Fire WFAT Method



Methodology

Depicted here are two wildfires that occurred in Colorado using three different modeling methods. The first method is supported by the Colorado State Forest Service (CSFS) and is called **The Colorado Wildfire Risk Assessment Portal** (COWRAP) (http://www.coloradowildfirerisk.com/). The second method is supported by USGS Earth Resource Observation and Science (EROS) Data Center and the USFS Remote Sensing Application Center (RSAC) and is called the **Monitoring Trends in Burn Severity** (MTBS) http://www.mtbs.gov/. The final method is a custom modeling method using LandFire Data (http://www.landfire.org) coupled with the **Wildland Fire Assessment Tool** (WFAT) (http://www.nifft.gov).

The COWRAP method is somewhat ridged in structure; which makes it difficult to update the information. Currently COWRAP is on a five year update time period. The MTBS method is designed to depict fire severity post-fire; hence, preplanning wildfire efforts are not applicable. The WFAT method is both easy to used, easy to update, reasonably accurate, and quick to deploy both before a wildfire event and during suppression efforts.

A custom python application (using arcpy) called WFAT_PREP was created by ERIA Consultants, LLC to tailor the Landfire data for input into the WFAT model. The WFAT model is an ArcGIS shareware application. Using these two applications in Arc GIS a unique fire severity surface can be generated for anywhere in the United States in less than fifteen minutes. This process could be instrumental in directing and optimizing fire suppression resources during a wildfire event. Furthermore, this techn ique can also be pivotal in assessing and prioritizing forest fuel reduction work for pre -fire mitigation under myriad scenarios.

WFAT Input Parameters

Fourmile Canyon Fire
Wind speed = 25 MPH
Wind Direction = Uphill
Foliar Moisture = 100%
Crown Fire Calculation = Scott & Reinhardt (2001)
Fuel Moisture = “default40”

High Park Fire
Wind speed = 23 MPH
Wind Direction = Uphill
Foliar Moisture = 100%
Crown Fire Calculation = Scott & Reinhardt (2001)
Fuel Moisture = “default40”

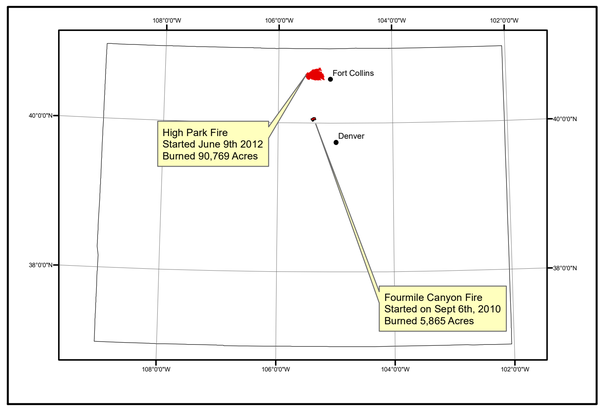
WFAT Input Data

The input data for the fires came from Landfire (http://www.landfire.gov) and these data are:

Canopy Closure
Canopy Base Height
Canopy Bulk Density
Canopy Height
Scott and Burgan Fire Behavior Fuel Models
Fuel Loading Model

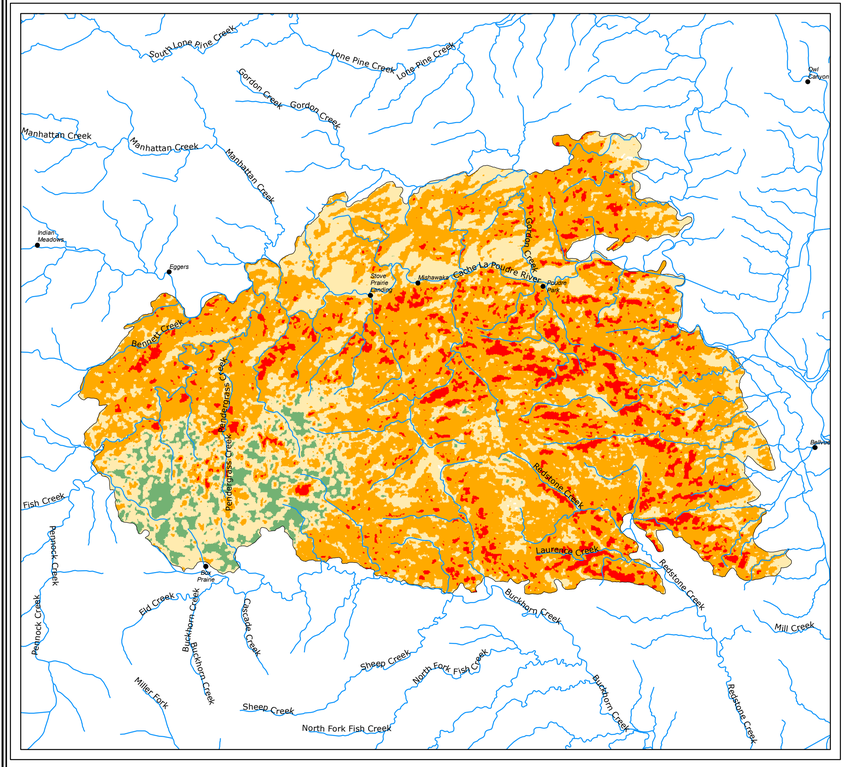
Elevation data came from the USGS and are 10 meter cell size. The products derived from the elevation data are:

Slope
Aspect
Elevation

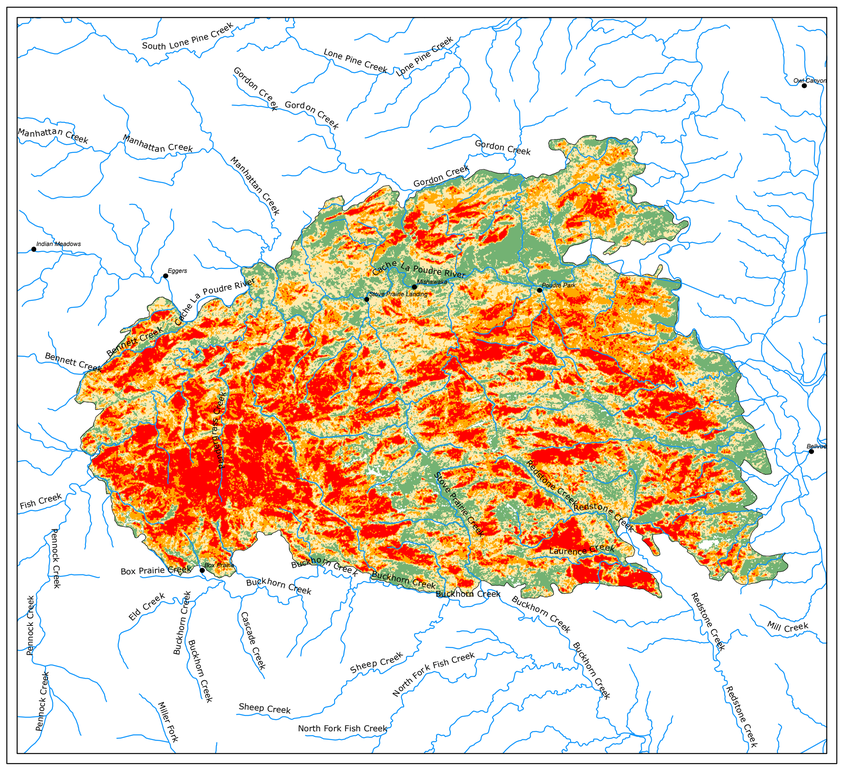


Legend

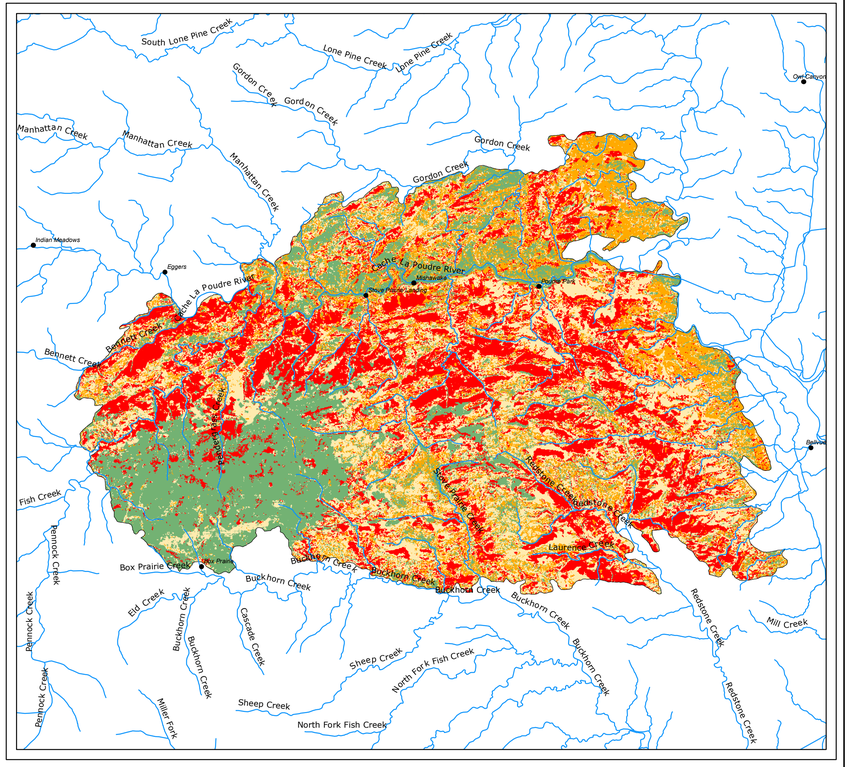
- Little or No Potential to Burn
- Low Potential to Burn
- Moderate Potential to Burn
- High Potential to Burn



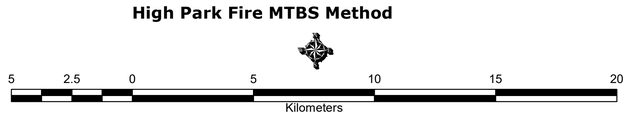
High Park Fire COWRAP Method



High Park Fire MTBS Method



High Park Fire WFAT Method



Document Name: GISITR_2015_coloradoautomatic_map2
Date: 8/24/2015
Map produced by M. Tuffly, ERIA Consultants, LLC
http://www.eriaconsultants.com