BehavePlus Fire Modeling System

Patricia L. Andrews Rocky Mountain Research Station | Fire Sciences Laboratory | Missoula, MT
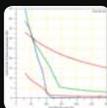Collin D. Bevins Systems for Environmental Management | Missoula, MT

What is BehavePlus?

- Computer program for personal computers
- Input entered by the user
- No data files or GIS layers
- Based on over 30 mathematical models
- Same modeling foundation as spatial systems FARSITE, FlamMap, and FSPro
- Each calculation assumes uniform conditions
- Produces tables, graphs, and diagrams

Table of rate of spread, flame length, area and perimeter for four fuel models.

Graph of rate of spread for four fuel models and a range of live fuel moisture.
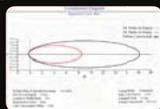
Diagram of fire containment.

Documentation, Training, and Help

In-program Help windows

Users' Guide
- Program operation

Variables Paper
- Describes the 186 variables
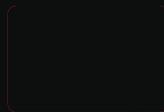
Self-study Lessons, organized in Units:
- Overview
- Introduction
- Operation
- Modeling

Fire Modeling Capabilities

SURFACE Surface Fire
- rate of spread
- flame length
- 13+40 standard fuel models
- wind adjustment factor
- much more

CROWN Crown Fire
- transition from surface to crown
- rate of spread
- fire type: surface, torching, conditional crown, crowning
- flame length and intensity

SPOT Spotting Distance
- maximum spotting distance from torching trees, burning piles, wind-driven surface fire

IGNITE Probability of Ignition
- from firebrand
- from lightning

SIZE Point Source Fire
- area
- perimeter
- shape

CONTAIN Fire Containment
- containment success given line construction rate, resource duration, etc
- final size, fire line constructed

SCORCH Crown Scorch
- scorch height from surface fire flame length

MORTALITY Tree Mortality
- probability of mortality from bark thickness and crown scorch

SAFETY Safety Zone Size
- area, perimeter, separation distance
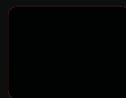- based on flame length

Application

BehavePlus can be used for any application that involves modeling fire behavior and effects.

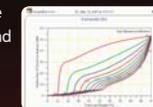### Predicting the Behavior of an Ongoing Fire

Prescribed Fire Planning

Fuel Hazard Assessment
- Effect of a change in surface and crown fuel on calculated fire behavior under various fuel moisture and wind conditions
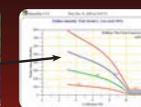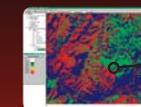
Model Understanding
- Influence of input values on calculations, e.g. effect of curing and live fuel moisture on rate of spread

Improved Use of Spatial Modeling Systems
- Interpreting maps of fireline intensity from FlamMap