

BehavePlus version 5 updates

- The User's Guide was not updated for version 5.0. The updates did not affect operation of the program. The version 4.0 User's Guide is still applicable.
- The Variables paper was updated for version 5.0. There are new and changed variables. Updates are also reflected in the Help windows.
- Additional lessons have been developed. All lessons are now labeled version 5.0. There is a statement on the first page of each lesson indicating the extent of the changes from the version 4.0 lesson. In some cases the only change was the headers and footers. Many of the screen captures were not redone and are still labeled version 4.0.0.
- Additional models have been added to the CROWN module. The previous values are on the 'Spread Outputs' tab. The new output variables are on the 'Intensity Outputs' tab. A new flow diagram is in the help window. New variables include crown fireline intensity and flame length, power of the fire and of the wind, and wind-driven or plume-dominated fire.
- The tree mortality models have been updated in the MORTALITY module to match those in FOFEM. Ten new mortality equations are available. In some cases the results are very different from the old equations. The help system gives the equations and a table of the inputs used for each. The option of directly entering bark thickness was removed because the new equations don't use that variable. The 'Mortality equation' variable added in version 4 was removed. The flow diagram was removed from the help system because it is not applicable to the new equations.
- Changes were made to several overstory variables. This fixes a fatal crash situation in version 4.0. The change resolves potential inconsistencies in the relationship among 'Canopy Height', 'Canopy Base Height', and 'Crown Ratio'. The variable 'Tree Height' was changed to 'Torching Tree Height' and is used only in SPOT to calculate spotting distance from torching trees. 'Canopy Height' is now used as input to MORTALITY rather than 'Tree Height'.
- A new variable, 'Downwind Canopy Height', was added to the SPOT module and is used in the calculation of spotting distance. This value can differ from 'Canopy Height' at the site of the fire.
- A new variable, 'Live fuel load portion', was added to the SURFACE Fuels Outputs tab.
- The SURFACE 'Basic Outputs' tab variables list was getting too long. So two additional tabs were added: 'Wind Outputs' and 'Slope Outputs.'
- Help > Installation Info now includes the path name of the startup worksheet file.
- The Workspace notation at the bottom of the worksheet is now updated as soon as the workspace is changed, created, or cloned.
- The maximum allowed value for wind speed was changed. Previous values were unreasonably high.

- ‘Surface Spread Distance’ is now correctly calculated for directions other than the direction of maximum spread (a bug in version 4).
- The description of the SoCalifornia folder for Chaparral custom fuel models was changed from a defunct web site to a reference that is available on the BehavePlus Publications page.
- The dead fuel moisture of extinction for fuel model SCAL15 was changed to the correct value, changed from 15% to 13%. (v5.0.3)
- The SCORCH module now uses the selected SURFACE module ‘Wind Speed’ input option even when SURFACE is not active.
- A two fuel model bug was fixed to produce the correct fireline intensity and flame length results. Other two-fuel bugs were fixed.
- The name of the 0Startup.bpw file was changed to 0Default.bpw to avoid confusion. The 0Default.bpw worksheet file includes all of the selections for input options and output variables, appearance options, etc. and can be used as a starting place for defining a new worksheet. The startup worksheet, on the other hand, is the worksheet that opens when the program starts. The user can change the startup worksheet on the File menu (an option added in version 4).
- The decimal display set under Configure > Custom Units preferences is no longer applied to input variables. The decimal precision entered by the user onto the worksheet (or via the Guide dialog) is maintained on the worksheet, used in the calculations, and displayed in output tables. This resolves previous problems with rounding. The value displayed on the worksheet is used in the calculations, not a stored value with more precision.
- When the units set is changed, six decimal places are given for input values (trailing zeros are suppressed). This helps the problem of rounding and changed values with units conversions.
- The Example Worksheets, FuelModeling.bpw and FuelModelingMetric.bpw, set six decimal places for fuel load variables for ‘Initialize from a Fuel Model’.
- When a change to units or decimals is made using Configure > Custom units preferences, the question is asked: “Save as Units Set File?” An answer of “No” applies the changes to the current session without a saving a Units Set file for future use.
- The Units and Decimals lesson was updated to explain current operation.
- A tool for Slope from map measurements has been added for quick calculations.
- The Wind Adjustment Factor help file includes an updated diagram and table. An error in the unsheltered WAF for fuel model SH4 is corrected (from 0.4 to 0.5). (v5.0.3)
- The maximum value allowed as input for fuel loading for all classes was increased from 31 to 45 ton/ac (100 tonne/ha). (v5.0.3)

- A new publication is available on the BehavePlus Publications page of www.FireModels.org:
Heinsch, Faith Ann; Andrews, Patricia L. 2010. **BehavePlus fire modeling system, version 5.0: Design and Features**. Gen. Tech. Rep. RMRS-GTR-249. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 111 p.
- The Fire Characteristics Chart, a supplement to the BehavePlus fire modeling system has been released. This program, a stand-alone version of the chart, provides graphical representation of modeled or observed fire behavior for surface and crown fire. It replaces the limited chart created in the SURFACE module of BehavePlus. (v1.0)
- A new publication related to the Fire Characteristics Chart is available on the BehavePlus Publications page of www.FireModels.org:
Andrews, Patricia L.; Heinsch, Faith Ann; Schelvan, Luke. 2011. **How to generate and interpret fire characteristics charts for surface and crown fire behavior**. Gen. Tech. Rep. RMRS-GTR-253. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 40 p.
- An error has been corrected in the special case palmetto-gallberry fuel model (not one of the 53 standard fuel models). The answer was wrong for live moisture less than 120%. (v5.0.5)
- The SURFACE options window is smaller to fit on small monitors. The “Fuel & Moisture” tab is now split into two tabs. (v5.0.5)