Spatial Fire Behavior Tools

Tools	Basic Fire Behavior (BFB)	FlamMap	Short-Term Fire Behavior (**STFB**)	FARSITE	Near-Term Fire Behavior (**NTFB**)	Fire Spread Probability (**FSPro**)
"Spread Model"	FlamMap Grid	Minimum Travel Time (MTT) (Finney 2002)	Minimum Travel Time (MTT) (Finney 2012) **STFB and FSPRO are being continually updated to match FlamMap 5 beta**	FARSITE (Finney 1998)	FARSITE (Finney 1998) **NTFB is slowly becoming its own unique thing. It has evolved considerably from FARSITE**	Minimum Travel Time (MTT) (Finney 2012) **STFB and FSPRO are being continually updated to match FlamMap 5 beta**
Duration	"Snapshot in time"	1 to 3 days	1 to 3 days	1 to 7 days	1 to 7 days	7 to 30 days
Weather	Daily, constant weather, wind, & fuel moisture	Daily, constant weather, wind, & fuel moisture	Daily, constant weather, wind, & fuel moisture	Hourly, variable weather, wind, & fuel moisture	Hourly, variable weather, wind, & fuel moisture	Hourly, variable weather, wind, & fuel moisture-plus ERC seasonal trend, auto-correlation, standard deviations & artificial time series
Type of Tool	Only in WFDSS	PC desktop	Only in WFDSS	PC desktop	Only in WFDSS	Only in WFDSS
Data Source	Automatic upload/editable LANDFIRE and NDFD	Manual Creation of LCP, Fuel Moisture & Weather files	Automatic upload/editable LANDFIRE and NDFD	Manual Creation of LCP, Fuel Moisture & Weather files	Automatic upload/editable LANDFIRE and NDFD	Automatic upload/editable LANDFIRE and NDFD
Output	Raster display of fire behavior	Major flow paths; arrival times	Major flow paths; arrival times	Perimeter; fire behavior grids	Perimeter; fire behavior grids	Probability surface

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Which Tool(s) Best Answer the Question?						
What is the probability the fire will reach the Interstate?						Uses forecast weather and climatological probabilities for a probabilistic fire spread map. Outputs best used after calibrating the landscape and tool.
The district ranger is concerned about a thermal trough pushing the fire; what might that look like?				Multiple windspeeds and directions per day can show fire growth and behavior in complex fuels/terrain.	Multiple windspeeds and directions per day can show fire growth and behavior in complex fuels/terrain.	
Given the changing winds and weather, when do you think the fire will reach the containment line?				Multiple windspeeds and directions per day can show fire growth and behavior in complex fuels/terrain.	Multiple windspeeds and directions per day can show fire growth and behavior in complex fuels/terrain.	

Which Tool(s) Best Answer the Question?						
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We are doing a large burn-out operation; if we get a spot across the line, what size will the fire be with and without a frontal passage?				Multiple windspeeds and directions per day can show fire growth and behavior in complex fuels/terrain.	Multiple windspeeds and directions per day can show fire growth and behavior in complex fuels/terrain.	
The fire has hung in the higher elevations and the season is coming to a close, what is the likelihood the fire will run again and threaten the communities in the valley?						Uses forecast weather and climatological probabilities for a probabilistic fire spread map. Outputs best used after calibrating the landscape and tool.
If the fire makes another run due to a cold front, what drainage do you think is most likely to carry the fire first to the community?		A single windspeed and direction (static or gridded) input can show fire growth and behavior in complex fuels/terrain.	A single windspeed and direction (static or gridded) input can show fire growth and behavior in complex fuels/terrain.			

Which Tool(s) Best Answer the Question?						
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What fire behavior (e.g. flame length, rates of spread, spotting) is expected with known weather and fuel conditions?	Using *static* weather/wind input and varying fuel models/terrain, provides fire behavior outputs within a "box" drawn around the fire area.	Using *static* weather/wind input and varying fuel models/terrain, provides output of fire behavior for a "box" around the fire; fire size, and time of arrival also given.	Using *static* weather/wind input and varying fuel models/terrain, provides output of fire behavior for a "box" around the fire; fire size, and time of arrival also given.	Using *variable* weather/wind inputs and varying fuel models/terrain, provides output of fire behavior, fire size, and time of arrival. Used with next 1-6 days of forecast weather.	Using *variable* weather/wind inputs and varying fuel models/terrain, provides output of fire behavior, fire size, and time of arrival. Used with next 1-6 days of forecast weather.	
There are fires all over the place; what is the chance these fires will merge in the next week or two?						Uses forecast weather and climatological probabilities for a probabilistic fire spread map. Outputs best used after calibrating the landscape and tool.
Can you reconstruct the growth of this fire if we provide you an ignition and the final fire perimeter?				Multiple windspeeds and directions per day can show fire growth and behavior in complex fuels/terrain.	Multiple windspeeds and directions per day can show fire growth and behavior in complex fuels/terrain.	

Which Tool(s) Best Answer the Question?						
Models	Basic Fire Behavior (BFB)	FlamMap	Short-Term Fire Behavior (**STFB**)	FARSITE	Near-Term Fire Behavior (**NTFB**)	Fire Spread Probability (**FSPro**)
If a fire reaches a point of concern, what fire behavior can I expect at that location?	Fire behavior outputs are available within a "box" drawn around the point of concern; uses static weather scenario.	Fire Behavior outputs and fastest fire travel routes are available for a "box" around the fire; uses one static weather scenario.	Fire Behavior outputs and fastest fire travel routes are available for a "box" around the fire; uses one static weather scenario.	Mapped Fire Behavior outputs are only available if the modeled fire actually reaches the point of concern, if so it is for the weather conditions modeled when the fire reaches that point	Mapped Fire Behavior outputs are only available if the modeled fire actually reaches the point of concern, if so it is for the weather conditions modeled when the fire reaches that point	
At what given windspeed can I expect to start seeing passive and or active crownfire on my landscape?	Using *static* weather/wind input and varying fuel models/terrain, provides fire behavior outputs within a "box" drawn around the fire area.	Using *static* weather/wind input and varying fuel models/terrain, provides output of fire behavior for a "box" around the fire; fire size, and time of arrival also given.	Using *static* weather/wind input and varying fuel models/terrain, provides output of fire behavior for a "box" around the fire; fire size, and time of arrival also given.			