



Purpose: Provide users with a summary of concerns and proposed solutions for using Pre-Refresh LANDFIRE data in the Fire Program Analysis (FPA) system.

Background

FPA users voiced two concerns about how the YR1 FPA system used LANDFIRE Fire Behavior Fuel Models (FBFM) for modeling fire behavior.

- The prevalence of non-burnable FBFMs, and
- The global adjustment to the FBFMs made at the request of the FPA Interagency Science Team (IST) from 102 to 101, and 122 to 121 FBFM classifications.

This document describes how the FPA Project plans to address these two concerns in the YR2 system release. These short-term solutions resulted from collaboration between the impacted FPU's expressing these concerns and the FPA Team that have been working with these FBFMs and expressed these concerns. FPA will use these short-term solutions only until the LANDFIRE Refresh data are available and incorporated into the FPA analyses.

The Prevalence of Non-Burnable FBFMs

Some Fire Planning Units (FPU's) have concerns regarding the classification of an over abundance of non-burnable FBFMs within their FPU's. These concerns were widespread and clearly expressed by representatives from the Eastern, California, and Southwest Geographic Areas.

As implemented during the first FPA analysis year, when the FPA system models an ignition placed on the landscape in any non-burnable FBFM, the system excludes that ignition from initial response workload modeling. By excluding the ignition, this reduced the modeled Fire Workload Area (FWAs) workload by that one ignition. FPU's perceived this resulted in a lower or less than "real" indication of the FPU's' initial response workload. Consequently, this could result in unrealistic IRS model outputs.

Year 2 Solution to the Prevalence of Non-Burnable FBFMs

In the FPA Initial Response Simulator (IRS), when the Fire Ignition Generator (FIG) creates a modeled ignition (based on historic fire records) that occurs in one of the non-burnable LANDFIRE FBFM's, FPA assigns the following fire behavior:

- *For FBFMs NB1 (Urban Developed), NB2 (Snow/Ice), NB8 (Open Water), NB9 (bare ground):*

The system draws from the distribution of the fuel layer identified as existing for the burnable fuel types within the Fire Workload Area to assign a fuel type to each modeled ignition.

- *For FBFM NB3 (Ag):*

The system will assign aGS1 fuel type and then use the initial calculated fuel moistures and wind speed.

- *For NB6 (emergent wetland), or NB7 (moss):*

The system will default the Rate of Spread to .10 chains per hour with a .5-foot flame length and a Fire Intensity Level of 1.

The Large Fire Module places modeled ignitions only on a burnable FBFM inside the FWA in which the “exceed simulation limit” (ESL) fires passed from the IRS module to the Large Fire Module. No ESL fires passed to the Large Fire Module are ever placed outside of the FWA where they started in the IRS module. There is no possibility of a modeled ignition being placed on a non-burnable FBFM because the non-burnable FBFMs are not included as a possible location for the modeled ignition to be placed.

The Global Adjustment to the FBFMs 102 and 122

The Geographic Areas concerns are not that an adjustment occurred, but that the adjustment was global for all occurrences of these specific FBFMs within the entire FPU, and all FPUs that contained these FBFMs. All FBFMs of classification 102 and 122 that occurred in the FPUs changed to FBFM101 and 121 respectively. In reality, not every acre of these FBFMs in an FPU actually burns like a lower rate of spread classification. The concern is that there are significant numbers of acres of the FBFM with a higher rate of spread classification that should have been left in the original LANDFIRE-mapped state and not adjusted globally.

As the system was designed for the first year’s analysis, the adjustment to the FBFMs was made, by FPA, to each acre where 102 and 122 appear in the LANDFIRE data. Feedback and the following suggested solutions came from a prototype workshop.

Year 2 solution to concerns about the global adjustment of FBFMs 102 and 122

The global adjustments made to LANDFIRE FBFMs 102 and 122 for the first FPA analysis year will be removed from the fuel model data layer used in both IRS and the Large Fire modules. Within the FPA IRS module, the FPU Planner will be able to assign a coefficient per fuel model within each FWA. The calculated rate of spread will be adjusted for all 270-meter cells having that fuel model in that FWA using the Fuel Model Rate of Spread Coefficient. The acceptable range is 5 to .01.

The Large Fire Module simulations (FSim) occur using unadjusted LANDFIRE data. After the simulations are complete, the FPA fire behavior specialist will evaluate the burn probabilities for the FSim standard run. If the outputs of the standard run are too problematic for modeling purposes (i.e. the probability is too high, not reasonable, not close to historic values, etc.) then a rate of spread adjustment will be made by the FPA fire behavior specialist. The rate of spread adjustment applies to the FBFM for all occurrences within the FPU. This does not change the FBFM, but it will change how the statistical model reflects fire behavior.

The solution to adjust the rate of spread per FBFM and the comparison of output rates of spread, FILs, and final fire size have been, and will continue to be a collaboration between the FPA large fire team and the FPA IST to check for model appropriateness. FPA analyses will use these short-term solutions until the LANDFIRE Refresh data are available.