The Wildland Fire Investment Planning System (WFIPS)

Briefing 11/21/2016, Mark A. Finney

**Purpose:** The WFIPS system is intended to conduct risk-based analysis of fire management activities and wildfire outcomes for alternative investments in Preparedness, Hazardous Fuels, and Large Fire Suppression. Analysis occurs at user-specified scales from local (i.e. District, National Forests) to Regional and National for all lands and all agencies (provided resources are identified). The risk-basis for WFIPS means that it will be capable of performing multiple annual scenarios (e.g. 50 or 100 or more) to encompass the effects of variation among fire seasons on fire management performance metrics. Ranges of preparedness resources and fuel treatment can be specified and large fire outcomes evaluated (sizes, costs, impacts to population).

**Background:** The WFIPS approach is a direct descendant of FPA. WFIPS incorporates the major components of FPA in a new framework that runs on large parallel computers under the Windows OS. Because of the large databases supplied with the program, a cloud-based computing approach has been explored so that users access the program and data with minimal installation on local computers and results of analyses can be stored and summarized. The components of WFIPS include:

* Fire Occurrence Database (FOD) – historical fire records, all lands and agencies from 1992-2014
* Fire Fighting Resource Database – nationwide resources by dispatch location, FS & some DOI, including national and regional resources (LAT, Hotshots etc.).
* Gridded weather data set for the entire country – allows for analysis of spatial interactions of fire activity and demand on resources
* Fire Ignition Generator (FIG) – nationwide wildfire ignitions generated for 500 years using the FOD & gridded weather at 32 km
* Fire Workload Areas (FWA)– polygon data showing dispatch rules and fire management objectives
* Initial Attack Module – Simulates IA on all fires, identifies contained vs. escaped fires
* Large Fire Simulation (FSim) – large fire sizes, costs, impacts on populations for 10,000 “years”
* Hazardous Fuel Treatment – layers showing where fuel treatments are effective and changes to fuels and fire behavior resulting from treatment

**Status:** The WFIPS program is scheduled for testing by select fire planner user groups by March 2017 for regional and national-scale analysis. User-interface features allow for changing the number of firefighting resources by location. In addition, the following functions exist:

* Effects of IA resource drawdown from commitment to large fires,
* Effects of resource prepositioning to anticipate changes in fire activity,
* Full or modified IA suppression response
* Fuel treatment conducted by specifying the amount of treatment, percentage of area treated, or a spatial mask of treatment
* Large fire outcomes expressed in costs, area burned, and population affected