



The Fire Emission Production Simulator (FEPS)

About FEPS

The Fire Emission Production Simulator (FEPS) is a user-friendly computer program designed for scientists and resource managers. The software manages data concerning consumption, emissions, and heat release characteristics of prescribed burns and wildland fires. The original Emissions Production Model (EPM) was designed to help managers estimate and mitigate the rates of heat, particles, and carbon gas emissions from controlled burns of harvest-slash residue in Northwest forests. In updating EPM, a significant number of improvements were made to the usability, applicability, and accuracy of the model. The calculation approach was redesigned, and the model has been renamed FEPS. The most recent FEPS update, includes the fuels data from the most popular fuelbeds in the Fuel Characteristic Classification System and produces hourly emission and heat release data for prescribed and wildland fires. It is now part of the Fuel and Fuel Tools.

FEPS can be used for most forest, shrub and grassland types in North America and the world. The program allows users to produce reasonable results with very little information by providing default values and calculations; advanced users can customize the data they provide to produce very refined results.

Total burn consumption values are distributed over the life of the burn to generate hourly emission and release information. Data managed includes the amount and fuel moisture of various fuel strata, hourly weather, and a number of other factors.



FEPS can be used for most forest, shrub, and grassland types in North America and the world. The program allows users to produce reasonable results with very little information by providing default values and calculations, and advanced users can customize the data they provide to produce very refined results.

<http://www.fs.fed.us/pnw/fera>

Using FEPS

FEPS version 1.1 produces hourly emission and heat release data for prescribed and wildland fires. You start with a description of an Event. This description includes the name, location, start date, end date, and other properties. Then, for a given Event, you may specify up to five unique fuel profiles. Each profile includes fuel loading and fuel moisture information. Based on these data, FEPS will calculate total fuel consumption for each profile. FEPS then determines flaming, short-term smoldering (< 2 hrs), and long-term smoldering involvement and consumption. Finally, you indicate how the Event behaves over time. FEPS uses hourly data on fire size and local weather conditions to calculate emissions and heat release parameters on an hourly basis. Fuel characteristics for each hour are managed by distributing the fire across the five user-specified fuel profiles.



FEPS Events



In order to use FEPS efficiently, it is important to understand how FEPS manages Events. In FEPS, individual studies are called Events. An Event stores information about and calculates emission and release information for an entire burn (either a prescribed fire or a wildland fire) at a single location.

Because of the relative complexity of the data necessary to define an Event, users are not allowed to create one from blank input screens. All Events are created from existing Events, or System or User Defaults (templates). This approach helps the user make sure that an Event dataset is complete. However, it is incumbent on the user to review all of the supplied data, and revise it as necessary to make sure that they are correct. This procedure allows a user with less specific knowledge of a fire to accept the data in a System Default as a starting point and get reasonable results, and also allows users with more specific knowledge of a fire to completely customize the data used to compute emissions.

Fire Emission Production Simulator

Version 1.1.0

Developed By:
David V. Sandberg, USDA Forest Service,
Pacific Northwest Research Station
Gary K. Anderson, URS
Robert A. Norheim, University of Washington



For More Information Contact:

Susan Prichard
Fire and Environmental Research Applications Team
Office and cell phone: (509) 341-4493
E-mail: sprich@uw.edu

