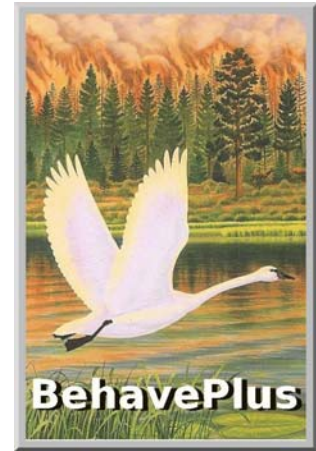


### **BehavePlus fire modeling system:**

Workshop Contact: Pat Andrews  
e-mail: [pandrews@fs.fed.us](mailto:pandrews@fs.fed.us)  
Phone: 406-329-4827

BehavePlus is the successor to BEHAVE, which was first available for field application in 1984. It continues to be an appropriate tool for many fire management applications including prescribed fire planning, fuel modeling, fuel hazard assessment, and projecting the behavior of an ongoing fire.

BehavePlus can be effectively used to learn about the fire models (such as transition to crown fire) that are included in spatial modeling systems where relationships are not as readily apparent. The relationship among BehavePlus, FARSITE, FlamMap, and FSPro will be explained.



The workshop will be useful to those not familiar with BehavePlus, to help them see if it meets their needs. It will also be valuable to experienced BehavePlus users who will see helpful features, the newest modeling capabilities, and recently developed supporting material.

BehavePlus includes models for surface and crown fire spread and intensity, crown fire type, safety zone size, size and shape of a point source fire, containment requirements, spotting distance, scorch height, tree mortality, probability of ignition, and fine dead fuel moisture. Special features of the program include producing tables of acceptable fire conditions for fire prescriptions, exporting results for further analysis using a spreadsheet, developing workspaces for documentation files, and more. The program help system includes a description of the many input and output variables. That information is also available in a single reference document with many internal links.

Participants can either watch a demonstration of version 4.1, or run the program along with the presenter. BehavePlus version 4.0 is available on [www.FireModels.org](http://www.FireModels.org) along with supporting documentation and training material. Version 4.1 will be available before the Fire Congress.



### **Smoke Modeling:**

Workshop Contact: Gary Ottmar et al.  
e-mail: gachteimeier@fs.fed.us  
Phone: 706-559-4239

Provide participants with an overview of a variety of smoke modeling tools available to prescribed burners to help mitigate the adverse impacts of their smoke. This workshop will cover tools that range in complexity from the simple geometric screening system outlined in "A Guide for Prescribed Fire in Southern Forests" to more complex models such as VSmoke, Hysplit and the BlueSky smoke modeling framework, all of which can be accessed through the internet. In addition participants will learn how to use PB-Piedmont, a smoke model designed specifically for looking at potential nighttime smoke problems.

## **A Suite of Fuel Management Tools: Fuel Characteristics Classification System, National Fuels Photo Series, Digital Photo Series, and Consume 3.0:**

Workshop Contact: Roger Ottmar et al.  
e-mail: rottmar@fs.fed.us  
Phone: 206-732-7826

The Fire and Environmental Research Applications team (FERA) of the Pacific Wildland Fire Sciences Laboratory has developed a suite of four fuel management products that will be demonstrated at this workshop. This suite includes the Fuel Characteristics Classification System (FCCS 2.0), National Fuels Photo Series, Digital photo Series, and Consume 3.0. These four tools work together and allow users to characterize fuelbeds, assess potential fire hazard and surface fire behavior, and estimate the amount of fuel consumed and emissions produced if burned during a wildland fire.

### **Fuel Characteristics Classification System (Version 2.0)**

FCCS version 2.0 is a user-friendly software program that allows users to access fuelbeds from a nation-wide library or create their own custom fuelbeds. FCCS fuelbeds were compiled from published literature, fuels photo series, fuels data sets and expert opinion. Users can modify FCCS fuelbeds to create a set of customized fuelbeds representing any scale of interest.



When a user has completed editing fuelbed data, FCCS reports input and calculated fuel characteristics for each existing fuelbed component, from canopy fuels to ground fuels. FCCS also calculates the relative fire hazard of each fuelbed, including surface fire behavior, crown fire, and available fuel potentials, scaled on an index from 0 to 9. These FCCS fire potentials facilitate communication of fire hazard among users by providing an index of the intrinsic capacity of each fuelbed for surface fire behavior, crown fire and available consumption of fuels. All potentials assume dry benchmark environmental conditions (no slope, 4 mph midflame wind speed, and dry fuel moistures).

FCCS predicts surface fire behavior, including reaction intensity ( $\text{Btu ft}^{-2} \text{min}^{-1}$ ), flame length (ft), and rate of spread ( $\text{ft min}^{-1}$ ), based either on dry benchmark environmental conditions or on those specified by the user. By comparing predicted flame length and rate of spread, FCCS provides a crosswalk between its fuelbeds, the original 13 Fire Behavior Prediction System fuel models, and the 40 standard fuel models. FCCS 2.0 also reports carbon storage by fuelbed category and subcategory and predicts the amount of

combustible carbon in each category and subcategory based on selected fuel moisture scenarios. The website for the FCCS 2.0 is: <http://www.fs.fed.us/pnw/fera/fccs/index.shtml>.

### Natural Fuels Photo Series

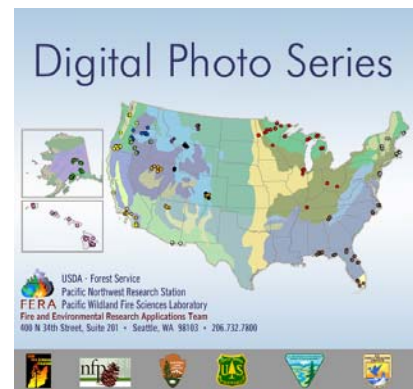
The Natural Fuels Photo Series are useful tools to quickly and inexpensively evaluate vegetation and fuel conditions in the field. This collection of data and photographs collectively display a range of natural conditions and fuel loadings in a wide variety of ecosystem types throughout the Americas from central Alaska to central Brazil. Fire managers are the primary target audience of the Natural



Fuels Photo series, although the data presented will also prove useful for managers, scientists, and researchers in other natural resource and science fields. The website for the photo series is: [http://www.fs.fed.us/pnw/fera/research/fuels/photo\\_series/index.shtml](http://www.fs.fed.us/pnw/fera/research/fuels/photo_series/index.shtml).

### Digital Photo Series

The Digital Photo Series contains searchable data and images for the nearly 400 sites contained in the natural fuels Photo Series, representing fuels in a wide range of ecosystems throughout the United States. Each entry includes a site description, species composition, fuel loading and arrangement, and overstory composition and structure. This information can be used for planning fuels treatments or other management actions and as inputs to fire behavior and fire effects models and applications. The Digital Photo Series is available online at: <http://depts.washington.edu/nwfire/dps/>.



### Consume 3.0

Consume 3.0 is a user-friendly software application for estimating fuel consumption and emissions produced. Land managers and researchers input fuel characteristics, length of ignition, fuel conditions, and meteorological attributes; Consume then calculates fuel consumption and emissions by combustion phase. Consume is designed to import data



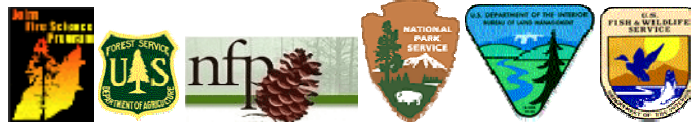
directly from the Fuel Characteristic Classification System (FCCS), and its output is formatted to feed

other models and provide usable reports for burn plan preparation and smoke management requirements. Consume can be used for all forest, shrub and grasslands in North America. The Consume 3.0 website is: <http://www.fs.fed.us/pnw/fera/research/smoke/consume/index.shtml>.

\* Corresponding author: Rodger D. Ottmar ([rottmar@fs.fed.us](mailto:rottmar@fs.fed.us)), Pacific Wildland Fire Sciences laboratory.

## Funding Partners:

### Fuel Characteristics Classification System



We acknowledge funding from the Joint Fire Science Program under Project JFSP 98-1-1-06  
Natural Fuels Photo Series

U.S. Department of the Interior; USDA Forest Service -- Pacific Northwest Region, Pacific Southwest Research Station; Joint Fire Science Program; U.S. Agency for International Development (Latin America and the Caribbean Bureau and the Mexico Mission); U.S. Forest Service International Programs; Department of Defense -- Eglin Air Force Base (Natural Resources Branch), Pohakulo and Makua Training Areas; State of Hawaii, Department of Natural Resources (Division of Forestry and Wildlife); University of Brasilia Department of Ecology; National Park Service -- Hawaii Volcanoes National Park

### Digital Photo Series



### Consume 3.0



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# Monitoring Trends in Burn Severity (MTBS)

## Understanding and Using Data Products from the Monitoring Trends in Burn Severity Project

Workshop Contact: Kari Pabst et al.  
e-mail: [kpabst@usgs.gov](mailto:kpabst@usgs.gov)  
Phone: 605-594-2787

Characterizing fire effects with satellite remote sensing data is the focus of the Monitoring Trends in Burn Severity (MTBS) project, a multi-year project conducted by the USDA Forest Service and the US Geological Survey. MTBS is generating a consistent, national-scale inventory of mapped historical and current fires in the United States. All identifiable fires in the western U.S. greater than 1,000 acres and in the eastern U.S. greater than 500 acres are being mapped. Currently, over 7,000 fires have been mapped by the project and the data are freely available at <http://www.MTBS.gov>

### Workshop Objective

Participants will learn about the MTBS geospatial data available for assessing fire effects. The course will provide instruction on interpretation and limitations of MTBS data, and the appropriate application of the data in the context of management decisions.

### Course Description

The workshop will introduce participants to the concepts and principles used by MTBS to map fire severity using remote sensing. Participants will learn how to access MTBS data via the project website, customize MTBS fire severity data for specific user needs, integrate and analyze these data with local GIS map layers, and how this information can support management decisions.

### Target Audience

The target audience for the workshop is, but not limited to, land managers, fire ecologists, university staff and students. Space is limited to 25 participants, so sign up early!

### Prerequisites

Participants should be familiar with ERDAS Imagine, ArcGIS 9.x, Microsoft Office, and basic computer skills such as moving and copying data within the Windows Explorer file management system.

Computer hardware and software will be provided to all workshop participants. MTBS data and other ancillary GIS data layers will also be provided.

### Course Duration

This workshop will last all day Monday, November 30, 2009

## **A Methodology to Evaluate Fire Hazard Gains vs. Environmental Losses after Fuel Treatments in the Wildland-urban Interface**

Workshop Contact: Chris Dicus et al.  
e-mail: [cdicus@calpoly.edu](mailto:cdicus@calpoly.edu)  
Phone: 805-756-5104

Wildfires are increasingly leading to loss of life and property in the wildland-urban interface, resulting in ever-mounting calls for fuel treatments in order to inhibit fire spread and intensity. Alternatively, vegetation is much more than simply fuel, providing various levels of tangible and intangible ecosystem services, dependent on its composition and structure. Thus, in order to best facilitate long-term sustainability, there is a critical need to simultaneously assess the tradeoffs in vegetation's potential to facilitate destructive wildfires versus the societal benefits that it provides.

This workshop demonstrates such a methodology, where potential changes to both fire behavior and various ecosystem services (e.g., air pollution removal capacity and carbon sequestration) are concurrently analysed utilizing fuel sampling techniques, wildland fire behavior simulations, and the Urban Forest Effects model. Examples are given following common fuel treatments in three distinct ecosystems, including Sierra Nevada mixed-conifers, Klamath Mountains mixed-conifer, and southern California chaparral. Specific steps of the methodology will be provided and landscape-scale considerations will be reviewed. Potential merits, complications, and limitations of the methodology are also discussed.