Supporting Documentation for Fire Size and Spread, IFT-size (based on the SIZE module in BehavePlus)

Name of Software Tool: IFT-size

Current Version Description/Date: IFT-size version 01-31-12

Software Code and History: The mathematical code for IFT-size is from the Fire Behavior Software Developer Kit (FBSDK) and the BehavePlus5 xfblib.cpp and xfblib.h. IFT-size (01-31-12) implements the critical functionality found in the BehavePlus-SIZE module. Details comparing the functionality of BehavePlus5 and equivalent tools in IFTDSS can be found in Drury et al. (2012, BehavePlus Functionality available in IFTDSS Version 1.0). Rigorous testing has been performed to verify that the mathematical output from the IFT-size module is consistent with the output from the BehavePlus5-SIZE module. Details concerning the output evaluation between the BehavePlus-SIZE and IFT-size modules can be found in PDF files included in the IFTDSS online help (under **IFTDSS Compared with Other Systems > Module Test Cases**). Future versions of IFTDSS are scheduled to expand the BehavePlus functionality.

Software Developer(s) Names, Organization, and Contact Information:

- BehavePlus was developed by U.S. Forest Service, Rocky Mountain Research Station, Fire, Fuel, and Smoke Science Program. Contact information is available on: http://www.firemodels.org/index.php/behaveplus-support/behaveplus-contact-us
- IFT-size was developed by the IFTDSS Development Team based on software libraries provided by the BehavePlus developers. The IFTDSS Development Team may be contacted using the Feedback function available on every page of IFTDSS.

Science Module Contact, Names, Organization, and Contact Information:

- Contact information for implementation of the SIZE module in BehavePlus or the underlying scientific algorithms is available on: http://www.firemodels.org/index.php/behaveplus-support/behaveplus-contact-us
- For questions regarding IFT-size, please contact the IFTDSS Team using the Feedback function available on every page of IFTDSS.

Availability of the Version of Record: The latest version of the software code for IFT-size resides with Sonoma Technology, Inc. (STI) and is being used in IFTDSS version 1.0. However, STI did not develop the scientific algorithms within the software code. The IFT-size software module code is public domain and available from STI upon written request.

Primary Funding Sources:

- BehavePlus development and support has been funded by U.S. Forest Service, Rocky Mountain Research Station, Fire, Fuel, and Smoke Science Program; U.S. Forest Service, Fire and Aviation Management; the Joint Fire Science Program (JFSP).
- IFT-size development was funded by JFSP.

Application Purpose (General): The IFT-size module is used to predict the size (area and perimeter), shape (length and width), and spreading distances of an elliptically shaped point source fire. These output variables are based on an effective wind speed, which is the combined effect of midflame wind speed and slope steepness in the direction of maximum fire spread. Surface rate of spread and elapse time(s) are also needed as module input variables. An elapse time is the time for which the fire is spreading at an assumed constant rate. The IFT-size module can be used to model fire size and spreading distances for Element 16 and 17 (Holding and Contingency plans) of a burn plan, and can be used to facilitate decision making for other Elements of a burn plan.

Application Purpose (Fuel Treatment): The IFT-size module can be used for prescribed burn planning and to fill in specified elements of a burn plan.

User/Application Documentation:

- Documentation of BehavePlus operation and application: http://www.firemodels.org/index.php/national-systems/behaveplus

User Application Guidance:

- The IFTDSS online help includes a PDF tutorial that illustrates how to use IFTDSS to prepare a burn plan (*Preparing a Prescribed Burn Plan*).

Scientific Foundations of the Software Tool:

- Degree of validation/evaluation and availability of written results:
  No information available at this time.
- Publications describing BehavePlus and the fire models on which it is based:
  http://www.firemodels.org/index.php/behaveplus-introduction/behaveplus-publications

Training Availability:

- Training on BehavePlus can be found at:
  http://www.firemodels.org/index.php/behaveplus-support/behaveplus-training