Module and Pathway Test Report

Module: FBSDK Downloads, July 2011
Pathway(s): Predict fire size and spread distance (IFT-size)
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Test Period: March 2012

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General Testing Procedures

All modules implemented in IFTDSS undergo two types of testing:

- **Scientific testing** to ensure that the outputs produced by the module are consistent with a range of expected values generated by the native desktop software application and/or provided by the scientific model developer(s). These tests include comparisons for a range of predefined scenarios developed to exercise different parts of the module.
- **Software testing** to ensure that the module is functioning from a usability perspective, accepting inputs, and producing outputs without generating software error reports. These automatic tests also ensure that as updates are made to the models or modeling framework, each individual module produces correct data values.

This document describes Sonoma Technology, Inc.'s test cases.

Scientific Testing

Predict Fire Size and Spread Test Case

This test case compared the Predict Fire Size and Spread module in IFTDSS to the desktop version of BehavePlus 5.0.5 using three simulations to test for data ranges commonly observed by users and allow the comparison of a variety of results. A total of seven output parameters were compared.

Inputs and Results File Name

- Predict fire size and spread test case results (included in the IFTDSS online help under **IFTDSS Compared with Other Systems > Module Test Cases**)
- Predict fire size and spread test case summary (Appendix)

Passed/Fail: Passed

Issues: None identified

References

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

Appendix: Scientific Test Case for the IFTDSS Predict Fire Size and Spread Module as Implemented in BehavePlus

Summary of Findings

The Predict Fire Size And Spread module as implemented in IFTDSS is a scientifically sound representation of the desktop version of BehavePlus 5.0.5. In this test case, the output values from IFTDSS and desktop BehavePlus matched with negligible rounding/truncating differences.

Methods

Predict Fire Size and Spread Test Case

This test case compared the Predict Fire Size and Spread module in IFTDSS to the desktop version of BehavePlus 5.0.5 using three simulations (Table 1) to test for data ranges commonly observed by users and allow the comparison of a variety of results.

Table 1. Input data used for the Predict Fire Size and Spread module test case.

Input Parameter	Unit	Simulation 1	Simulation 2	Simulation 3
Effective Wind Speed	miles/hour	5	15	25
Surface Rate of Spread (maximum)	chains/hour	10	50	100
Elapsed Time	hours	0.5	2	4

Results

Predict Fire Size and Spread Test Case

Results from the Predict Fire Size and Spread module implemented in IFTDSS and desktop BehavePlus for the three simulations tested matched with negligible rounding/truncating differences (Table 2).

Table 2. Results from the Predict Fire Size and Spread module comparison.

Output Parameter	Unit	Simulation 1		Simulation 2		Simulation 3	
		IFTDSS	Behave Plus	IFTDSS	Behave Plus	IFTDSS	Behave Plus
Area	acre	0.97	1	169.12	169.1	1,749.98	1750
Perimeter	chains	12.41	12	213.3	213	825.19	825
Length-to-Width Ratio	chains/chains	2.25	2.2	4.75	4.8	7.25	7.2
Forward Spread Distance	chains	5	5	100	100	400	400
Backing Spread Distance	chains	0.27	0.3	1.13	1.1	1.92	1.9
Fire Length	chains	5.27	5.3	101.13	101.1	401.92	401.9
Maximum Fire Width	chains	2.34	2.3	21.29	21.3	55.44	55.4