FCCS Command Line Instructions

The Fuel and Fire Tools application contains the FCCS calculator and a command-line interface. You can run large sets of fuelbeds through the FCCS calculator from a command prompt by specifying a fuelbed directory.

1. Open a command prompt. In Windows, you can type "**cmd**" in the search box of the Start menu top open a command prompt.

2. Change directories to the FCCS folder within the Fuel and Fire Tools folder. For example:
   - `cd c:\FuelFireTools\FCCS`

3. Launch the calculator to get basic usage instructions.
   - `java –jar fuelbed.jar`

4. To run the FCCS for all fuelbeds within a folder (named "SampleFB" in this example and located within C:\FuelFireTools\FCCS) using the benchmark environmental scenario, simply type:
   - `java –jar fuelbed.jar SampleFB\*.xml`

5. To run the FCCS for the same fuelbed folder under a specified moisture scenario, first edit the file fccs_moisture.csv (which is located in c:\FuelFireTools\FCCS). Then type:
   - `java –jar fuelbed.jar SampleFB\*.xml –p moisture_file=fccs_moisture.csv`
   - `to generate an input file for Consume (consume_loadings.csv): java –jar fuelbed.jar SampleFB\*.xml –g`

6. To convert the output file (fccs_summary.csv) to metric values, type:
   - `C:\FuelFireTools\bin\python.exe fccs_post_process.py fccs_summary.csv metric_all.csv metric_output.csv true`

7. For other commands, such as specifying an output filename and location or specifying wind or slope inputs, please refer basic usage instructions within the command prompt.

*** ========== ***
FCCS Fuel Characteristics Calculator Version: 4.0.999

This program calculates various fuel characteristics. It can also create
a fuel loadings file for the Consume fuel consumption and emissions program.

Options:

-h, --help: Help text

-p, --param: Specify environmental parameters to the calculator

(windspeed, slope, moisture_id, moisture_file)
-g, --generate: Generate a Consume fuel loadings file.
-o, --output_filename: Specify the name for the results file.
-d, --dump_heap: Debugging switch.
-n, --dump_nodes: Debugging switch (print all nodes and values)
-l, --consume_loadings_filename: Specify the name for the Consume fuel loadings file.

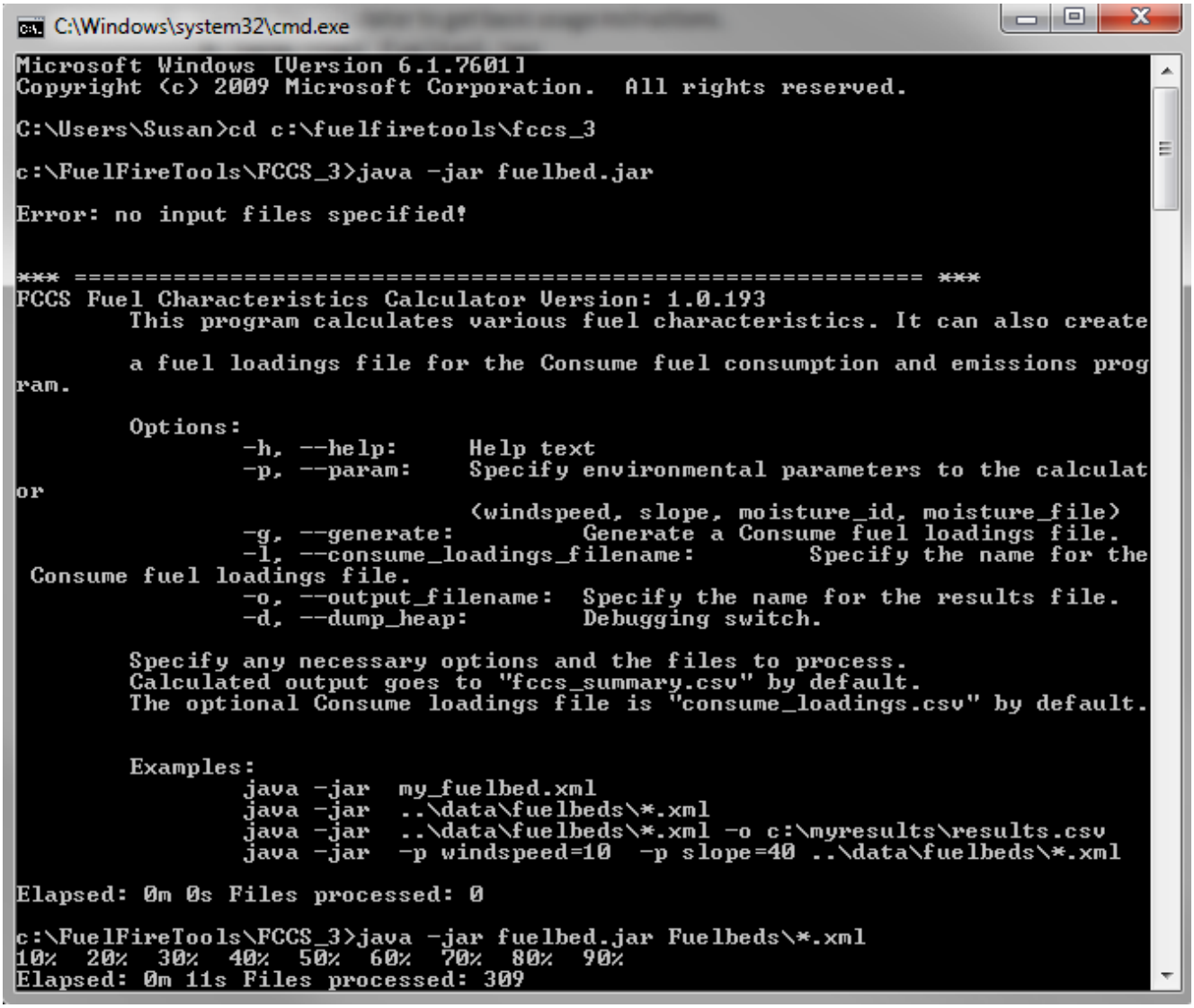
The moisture file format is comma separated values (csv) with the following columns:

oneHourFM,tenHourFM,hundredHourFM,liveNonWoodyFM,liveShrubFM,crownFM

Specify any necessary options and the files to process.
Calculated output goes to "fccs_summary.csv" by default.
The optional Consume loadings file is "consume_loadings.csv" by default.

Examples:

```
java -jar fuelbed.jar my_fuelbed.xml
java -jar fuelbed.jar ..\data\fuelbeds\*.xml
java -jar fuelbed.jar ..\data\fuelbeds\*.xml -o c:\myresults\results.csv
java -jar fuelbed.jar -p windspeed=10  -p slope=40 ..\data\fuelbeds\*.xml
```


C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Users\Susan>cd c:\fuelfiretools\fccs_3
c:\FuelFireTools\FCCS_3>java -jar fuelbed.jar
Error: no input files specified!
*** ========== ***
FCCS Fuel Characteristics Calculator Version: 1.0.193
This program calculates various fuel characteristics. It can also create
a fuel loadings file for the Consume fuel consumption and emissions prog
ram.
Options:
-h, --help: Help text
-p, --param: Specify environmental parameters to the calculat
or
(windspeed, slope, moisture_id, moisture_file)
-g, --generate: Generate a Consume fuel loadings file.
-l, --consume_loadings_filename: Specify the name for the
Consume fuel loadings file.
-o, --output_filename: Specify the name for the results file.
-d, --dump_heap: Debugging switch.
Specify any necessary options and the files to process.
Calculated output goes to "fccs_summary.csv" by default.
The optional Consume loadings file is "consume_loadings.csv" by default.
Examples:
java -jar my_fuelbed.xml
java -jar ..\data\fuelbeds*.xml
java -jar ..\data\fuelbeds*.xml -o c:\myresults\results.csv
java -jar -p windspeed=10 -p slope=40 ..\data\fuelbeds*.xml
Elapsed: 0m 0s Files processed: 0
c:\FuelFireTools\FCCS_3>java -jar fuelbed.jar Fuelbeds*.xml
10% 20% 30% 40% 50% 60% 70% 80% 90%
Elapsed: 0m 11s Files processed: 309

Input definitions

A sample FCCS moisture file is located within the FCCS folder (c:\FuelFireTools\FCCS\fccs_moisture.csv).

Variable	Definition (English, metric units)	Sample Unit
oneHourFM	Fuel moisture content of 1-hour time lag wood (0-1/4 inch diameter)	6%
tenHourFM	Fuel moisture content of 10-hour time lag wood (1/4-1 inch diameter)	8%
hundredHourFM	Fuel moisture content of 100-hour time lag wood (1-3 inch diameter)	10%
liveNonWoodyFM	Live fuel moisture content of herbaceous fuels	30%
liveShrubFM	Live fuel moisture content of shrubs	60%
crownFM	Life fuel moiustre content of tree crowns	60%

Output definitions

FCCS outputs will be found in the FCCS folder (e.g., C:\FuelFireTools\FCCS\fccs_summary.csv). Outputs are English units, but can be converted to metric using fccs_post_process.py (see example above in item #6)

Table 1: FCCS batch output variables and definitions.

Variable	Definition (English, metric units)	Sample output English units
Filename	Fuelbed filename	FB_0053_FCCS.xml
FB_ID	Fuelbed ID (alphanumeric)	53
FB_name	Fuelbed name	Pacific ponderosa pine forest
FCCS_Code	3-digit code representing surface, crownfire, and available fuel summary potentials, respectively	446
SFP	Surface fire behavior summary potential (0-9 index)	4.27
Surface_Reaction	Reaction potential (0-9 index)	3.61
Surface_Spread	Spread potential (0-9 index)	4.27
Surface_Flamelength	Flame length potential (0-9 index)	3.23
CFP	Crown fire behavior summary potential (0-9 index)	4.45
Crown_initiation	Crown fire initiation potential (0-9 index)	3.16
Crown_Transmissivity	Crown to crown transmissivity potential (0-9 index)	8.85
Crown_spread	Crown fire spreading potential (0-9 index)	4.26
AFP	Available fuel summary potential (0-9 index)	6.42
Available_Flame	Flame available fuel potential (0-9 index)	3.22

Variable	Definition (English, metric units)	Sample output English units
Available_Smolder	Smolder available fuel potential (0-9 index)	2.43
Available_Residual	Residual smolder available fuel potential (0-9 index)	0.76
ROS	Rate of spread, benchmark environmental scenario (ft, m)	4.55
FL	Flame length, benchmark environmental scenario (ft, m)	2.60
RI	Surface reaction intensity, benchmark environmental scenario (BTU ft^{-2} m^{-1}, KJ m^{-2})	2041.21
RI_shrub	Shrub component reaction intensity, benchmark environmental scenario (BTU ft^{-2} m^{-1}, KJ m^{-2})	0
RI_herb	Herb component reaction intensity, benchmark environmental scenario (BTU ft^{-2} m^{-1}, KJ m^{-2})	351.78
RI_wood	Downed wood component reaction intensity, benchmark environmental scenario (BTU ft^{-2} m^{-1}, KJ m^{-2})	504.60
RI_LLM	LLM component reaction intensity, benchmark environmental scenario (BTU ft^{-2} m^{-1}, KJ m^{-2})	1184.82
Xwalk13	Crosswalk to 1 of 13 original fuel models under benchmark scenario	9
ROS%13	Percent different ROS from crosswalk 13 fuel model, benchmark environmental scenario	66.78
FL%13	Percent different Flame length from crosswalk 13 fuel model, benchmark environmental scenario	104.01
Xwalk40	Crosswalk to 1 of 40 standard fuel models, benchmark environmental scenario	188
ROS%40	Percent different ROS from crosswalk 40 fuel model, benchmark environmental scenario	99.01
FL%40	Percent different FL from crosswalk 40 fuel model, benchmark environmental scenario	86.68
User_ROS	Rate of spread, user environmental scenario (ft, m)	4.55
User_FL	Flame length, user environmental scenario (ft, m)	2.59
User_RI	Surface reaction intensity, user environmental scenario (BTU ft^{-2} m^{-1}, KJ m^{-2})	2002.58
User_RI_shrub	Shrub component reaction intensity, user environmental scenario (BTU ft^{-2} m^{-1}, KJ m^{-2})	0
User_RI_herb	Herb component reaction intensity, user environmental scenario (BTU ft^{-2} m^{-1}, KJ m^{-2})	313.16
User_RI_wood	Downed wood component reaction intensity,	504.60

Variable	Definition (English, metric units)	Sample output English units
	user environmental scenario (BTU ft^{-2} m^{-1}, KJ m^{-2})	
User_RI_LLM	LLM component reaction intensity, user environmental scenario (BTU ft^{-2} m^{-1}, KJ m^{-2})	1184.82
User_xwalk13	Crosswalk to 1 of 13 original fuel models under user environmental scenario	9
User_ROS%13	Percent different ROS from crosswalk 13 fuel model, user environmental scenario	66.78
User_FL%13	Percent different FL from crosswalk 13 fuel model, user environmental scenario	103.63
User_xwalk40	Crosswalk to 1 of 40 standard fuel models, user environmental scenario	188
User_ROS%40	Percent different ROS from crosswalk 40 fuel model, user environmental scenario	99.01
User_FL%40	Percent different FL from crosswalk 40 fuel model, user environmental scenario	86.36
Tree_over_crown_load	Overstory tree crown load (tons ac^{-1}, Mg ha^{-1})	9.22
Tree_mid_crown_load	Midstory tree crown load (tons ac^{-1}, Mg ha^{-1})	
Tree_under_crown_load	Understory tree crown load (tons ac^{-1}, Mg ha^{-1})	0.295
Tree_aboveground_load	Aboveground biomass of trees (tons ac^{-1}, Mg ha^{-1})	56.00
Snag_class1_foliage_crown_load	Class 1 snag with foliage crown load (tons ac^{-1}, Mg ha^{-1})	0.12
Snag_class1_wood_load	Class 1 snag with foliage wood load (tons ac^{-1}, Mg ha^{-1})	4.64
Snag_class1_other_load	Class 1 snag other wood load (tons ac^{-1}, Mg ha^{-1})	
Snag_class2_load	Class 2 snag wood load (tons ac^{-1}, Mg ha^{-1})	1.96
Snag_class3_load	Class 3 snag wood load (tons ac^{-1}, Mg ha^{-1})	0.43
Ladderfuels_load	Ladder fuel load (tons ac^{-1}, Mg ha^{-1})	3
Shrub_primary_load	Primary shrub load (tons ac^{-1}, Mg ha^{-1})	
Shrub_primary_crown_load	Primary shrub crown load (tons ac^{-1}, Mg ha^{-1})	
Shrub_secondary_load	Secondary shrub load (tons ac^{-1}, Mg ha^{-1})	
Shrub_secondary_crown_load	Secondary shrub crown load (tons ac^{-1}, Mg ha^{-1})	
Shrub_needleDrape_load	Shrub needle drape load (tons ac^{-1}, Mg ha^{-1})	
Herb_primary_load	Primary herbaceous load (tons ac^{-1}, Mg ha^{-1})	0.05
Herb_secondary_load	Secondary herbaceous load (tons ac^{-1}, Mg ha^{-1})	0.01
Woody_sound_1hr_load	Sound 1hr wood load (tons ac^{-1}, Mg ha^{-1})	0.1
Woody_sound_10hr_load	Sound 10hr wood load (tons ac^{-1}, Mg ha^{-1})	1.5
Woody_sound_100hr_load	Sound 100hr wood load (tons ac^{-1}, Mg ha^{-1})	1.5

Variable	Definition (English, metric units)	Sample output English units
Woody_sound_1000hr_load	Sound 1000hr wood load (tons ac^{-1}, Mg ha^{-1})	8
Woody_sound_10khr_load	Sound 10,000hr wood load (tons ac^{-1}, Mg ha^{-1})	3
Woody_sound_GT10k_load	Sound >10,000hr wood load (tons ac^{-1}, Mg ha^{-1})	0
Woody_rotten_1000hr_load	Rotten 1000hr wood load (tons ac^{-1}, Mg ha^{-1})	3
Woody_rotten_10k_load	Rotten 10,000hr wood load (tons ac^{-1}, Mg ha^{-1})	1.5
Woody_rotten_GT10k_load	Rotten >10,000hr wood load (tons ac^{-1}, Mg ha^{-1})	0
Woody_pile_load	Pile load (tons ac^{-1}, Mg ha^{-1})	0.04
Woody_stumps_sound_load	Sound stump load (tons ac^{-1}, Mg ha^{-1})	0.04
Woody_stumps_rotten_load	Rotten stump load (tons ac^{-1}, Mg ha^{-1})	0.03
Woody_stumps_lightered_load	Lightered stump load (tons ac^{-1}, Mg ha^{-1})	
LLM_litter_load	Litter load (tons ac^{-1}, Mg ha^{-1})	1.52
LLM_lichen_load	Lichen load (tons ac^{-1}, Mg ha^{-1})	0.00
LLM_moss_load	Moss load (tons ac^{-1}, Mg ha^{-1})	0.13
Ground_upperduff_load	Upper duff load (tons ac^{-1}, Mg ha^{-1})	3.4
Ground_lowerduff_load	Lower duff load (tons ac^{-1}, Mg ha^{-1})	15.3
Ground_basalaccum_load	Basal accumulation load (tons ac^{-1}, Mg ha^{-1})	0.08
Ground_squirrelmid_load	Squirrel midden load (tons ac^{-1}, Mg ha^{-1})	
Total_aboveground_biomass	Total aboveground biomass (tree and shrub crowns excluded from this sum) (tons ac^{-1}, Mg ha^{-1})	56.01
Depth_shrub	Depth of shrub stratum (ft, m)	
Depth_herb	Depth of herb stratum (ft, m)	1
Depth_wood	Depth of wood stratum (ft, m)	0.08
Depth_LLM	Depth of litter-lichen-moss stratum (ft, m)	0.1
Depth_Surface_Fuels	Depth of surface fuels (ft, m)	0.04
PercentCover_shrub	Percent cover of shrub stratum (%)	
PercentCover_herb	Percent cover of herb stratum (%)	11
PercentCover_wood	Percent cover of downed wood stratum (%)	45
PercentCover_LLM	Percent cover of litter-lichen-moss stratum (%)	100
Version	FCCS version number	4.0.999