

Farsite Input Files

Use of the Farsite DLL is only supported thru use of input files.

'#' in first column indicates a comment line.

A user of the Farsite DLL should be familiar with FARSITE and the terminology FARSITE uses. It is not the intent of this document to educate a user in use of Farsite, but to document the available switches for use with the Farsite DLL.

The following is a list of available switches to embed in the Farsite input files.

MANDATORY Switches:

Switch: **FUEL_MOISTURES_DATA:**

Usage:

FUEL_MOISTURES_DATA: X

where X = the number of fuel model entries

NOTE: Fuel Model 0 is required! This is the default moistures to use when a fuel model is encountered in the lcp file that does not have an entry in the inputs file.

Fuel mode entry format:

Model FM1 FM10 FM100 FMLiveHerb FMLiveWoody

Example:

FUEL_MOISTURES_DATA: 3

#	Model	F1	F10	F100	FLH	FLW
	0	2	2	3	4	5
	1	4	3	6	10	16
	2	4	3	19	10	16

Switch: **RAWS**

Usage:

RAWS: X

Where X is the number of sequential hourly weather data entries, followed by X number of hourly weather data records, 1 per line. Note that this switch must be used with the **RAWS_ELEVATION** switch, and this switch can not be used with the **WEATHER_DATA** and **WIND_DATA** switches. Units are indicated by the **RAWS_UNITS** switch which is also required when using RAWS weather data.

Example and Format

```
# Year Mth Day HHMM Temp RH Pcp WS WDir CC
# Year = Year
# Mth = month,
# Day = day of month,
# HHMM = time of record (2 digits for hour, two digits for minute)
# Temp = temperature at time of record
# RH = relative humidity at time of record
```

```
# Pcp = hourly precipitation for the hour ending at time of record
# WS = wind speed at time of record
# WDir = azimuth of wind direction at time of record
# CC = cloud cover as integer percent (0 - 100) at time of record
```

Example:

```
RAWS: 5
2018 3 23 0700 78 18 0.00 2 177 40
2018 3 23 0800 76 22 0.00 3 235 35
2018 3 23 0900 74 22 0.00 3 236 0
2018 3 23 1000 72 22 0.00 7 233 0
2018 3 23 1100 71 22 0.00 1 230 30
```

Switch: **RAWS_ELEVATION:**

Usage:

RAWS_ELEVATION: X

Where X is the elevation of the weather observations in the RAWS section. Units are indicated by the RAWS_UNITS switch, feet when RAWS_UNITS is English, meters when RAWS_UNITS is metric.

Example:

RAWS_ELEVATION: 3532

Switch: **RAWS_UNITS:**

Usage:

RAWS_UNITS: X

Where X is either the string English or Metric indicating the units for the weather data in the RAWS section as well as the RAWS_ELEVATION

Example:

RAWS_UNITS: English

Switch: **WEATHER_DATA:**

Usage:

WEATHER_DATA: X

where X is the number of weather data entries, followed by X number of weather data records, 1 per line. NOTE: The weather data records must be in sequential order! No skipping days! Farsite will start conditioning from as early as possible in the weather stream and condition fuels through the end of the simulation.

Example:

```
# Mth Day Pcp mTH xTH mT xT xH mH Elv PST PET
```

```
# Mth = month,
```

```
# Day = day,
```

```
# Per = precip in hundredths of an inch (integer e.g. 10 = 0.1 inches),
```

```
# mTH = min_temp_hour 0-2400,
```

```
# xTH = max_temp_hour 0 - 2400,
```

```
# mT = min_temp,
```

```
# xT = max_temp,
```

```
# mH = max_humidity,
```

```
# xH = min_humidity,
```

```
# Elv = elevation,
```

```
# PST = precip_start_time 0-2400
```

```

# PET = precip_end_time    0-2400
# NOTE: do not leave any blank values
WEATHER_DATA: 17
7 17 0 400 1500 53 94 36 8 4478 0 0
7 18 0 500 1400 52 94 43 9 4478 0 0
7 19 0 500 1300 55 96 48 8 4478 0 0
7 20 0 500 1200 57 90 48 12 4478 0 0
7 21 0 600 1200 59 89 59 16 4478 0 0
7 22 0 500 1500 52 88 59 11 4478 0 0
7 23 0 400 1300 55 92 54 10 4478 0 0
7 24 0 400 1400 54 96 50 9 4478 0 0
7 25 0 500 1300 52 95 48 7 4478 0 0
7 26 50 600 1400 54 93 38 11 4478 1100 1700
7 27 0 400 1300 55 93 41 7 4478 0 0
7 28 0 500 1500 53 93 38 9 4478 0 0
7 29 0 500 1300 56 91 35 11 4478 0 0
7 30 0 500 1500 53 94 46 11 4478 0 0
7 31 0 500 1300 55 93 45 9 4478 0 0
8 1 0 500 1400 53 96 46 10 4478 0 0
8 2 0 400 1200 55 91 44 2 4478 0 0

```

Switch: **WEATHER_DATA_UNITS:**

Usage:

WEATHER_DATA_UNITS: units

where units is either METRIC or ENGLISH

Note: If not used weather data is assumed to be in English units.

Example:

WEATHER_DATA_UNITS: METRIC

Switch: **WIND_DATA:**

Usage:

WIND_DATA: X

where X is the number of Wind Data records

Example:

WIND_DATA: 7

```

# Mth Day Hour Speed Direction CloudCover
7 17 0 3 114 0
7 17 100 1 31 0
7 17 200 1 127 0
7 17 300 5 114 0
7 17 400 2 58 0
7 17 500 2 22 0
7 17 600 1 53 0

```

Wind Data records should be in ascending order, and should cover the same time frame as the weather data records. Small gaps are allowed, but Farsite will burn using the most available wind record so hourly wind records are desired.

Switch: **WIND_DATA_UNITS:**

Usage:

WIND_DATA_UNITS: units

where units is either METRIC or ENGLISH

Note: If not used wind data is assumed to be in English units.

Example:
WIND_DATA_UNITS: METRIC

Switch: **FOLIAR_MOISTURE_CONTENT:**

Usage:

FOLIAR_MOISTURE_CONTENT: X

where X is the foliar moisture content in percent. The default is 100 and 100 percent will be used if this switch is not present.

Example:

FOLIAR_MOISTURE_CONTENT: 90

Switch: **CROWN_FIRE_METHOD**

Usage:

CROWN_FIRE_METHOD: cfmeth

where cfmeth is either **Finney** or **ScottRhienhardt**

Note: If not used the Finney crown fire method will be used.

Example:

CROWN_FIRE_METHOD: ScottRhienhardt

Switch: **FARSITE_START_TIME**

Usage:

FARSITE_START_TIME: MM DD HHmm

Where MM is Month (1-12), DD is day of month, HH is hour(0-24) and mm is minute(0-59) of the fire start time.

Example:

FARSITE_START_TIME: 08 07 1000

Switch: **FARSITE_END_TIME**

Usage:

FARSITE_END_TIME: MM DD HHmm

Where MM is Month (1-12), DD is day of month, HH is hour(0-24) and mm is minute(0-59) of the fire end time (end of simulation).

Example:

FARSITE_END_TIME: 08 10 1800

Switch: **FARSITE_TIMESTEP**

Usage:

FARSITE_TIMESTEP: X

Where X is the Actual Time Step in minutes. Note there is no Secondary Time Step in the Farsite DLL.

Example:

FARSITE_TIME_STEP: 60

Switch: **FARSITE_DISTANCE_RES**

Usage:

FARSITE_DISTANCE_RES: X

Where X is a real number representing the distance resolution. Farsite DLL will check for new fire characteristics when this distance has been covered within a time step.

Example:

FARSITE_DISTANCE_RES: 30.0

Switch: **FARSITE_PERIMETER_RES**

Usage:

FARSITE_PERIMETER_RES: X

Where X is a real number representing the Farsite Perimeter Resolution. Farsite will have fire vertices every X meters along a perimeter while burning at each time step.

Example:

FARSITE_PERIMETER_RES: 60.0

Switch: **FARSITE_SPOT_PROBABILITY**

Usage:

FARSITE_SPOT_PROBABILITY: X

Where X is a real number from 0.0 - 1.0 representing the probability that an ember can survive to intersect the landscape. This probability check is done after an ember is lofted but before ember flight.

Note: Farsite generates a lot of embers. Generally, this probability should not be higher than 0.1 or Farsite will spend a great deal of time resolving perimeters of spots created by embers.

Example:

FARSITE_SPOT_PROBABILITY: 0.01

Switch: **FARSITE_SPOT_IGNITION_DELAY**

Usage:

FARSITE_SPOT_IGNITION_DELAY X

Where X is an integer representing the delay time in minutes before a spot fire is started after an ember lands on a burnable substrate.

Note: This switch should probably be set to zero (0) when acceleration is on.

Example:

FARSITE_SPOT_IGNITION_DELAY: 15

Switch: **FARSITE_MINIMUM_SPOT_DISTANCE**

Usage:

FARSITE_MINIMUM_SPOT_DISTANCE: X

Where X is the distance in meters an ember must travel before it can start a spot fire. This switch was added to speed up Farsite resolving fire polygons that were generally overrun by surface fire spread.

Example:

FARSITE_MINIMUM_SPOT_DISTANCE: 30

Switch: **FARSITE_ACCELERATION_ON**

Usage:

FARSITE_ACCELERATION_ON: X

Where X is either 0 for no acceleration or 1 to use acceleration.

Example:

FARSITE_ACCELERATION_ON: 1

Switch: **FARSITE_IGNITION_FILE**

Usage:

FARSITE_IGNITION_FILE: Filename

Where Filename is the complete path to the ignition shape file.

Example:

FARSITE_IGNITION_FILE: C:\Data\ignit.shp

Optional Switches:

Switch: **FARSITE_BURN_PERIODS**

Usage:

FARSITE_BURN_PERIODS: X

Where X is the number of burn period entries, immediately followed by X burn period entries on the next X lines in the inputs file. A burn period entry has the format of:

MM DD HHmm HHmm

Where MM is the month (1-12), DD is the day of the month, and the first HHmm is the burn period start hour and minute, and the second HHmm is the burn period end hour and minute.

Note that if no burn periods are used Farsite DLL will burn for the entire simulation period. Also, there can be more than one burn period per day but they must not overlap.

Example:

```
FARSITE_BURN_PERIODS: 4
08 07 1000 1800
08 08 1000 1800
08 09 1000 1800
08 10 1000 1800
```

Switch: **FARSITE_BARRIER_FILE**

Usage:

FARSITE_BARRIER_FILE: Filename

Where Filename is the path to the barrier shape file. No barriers are required. Note: Farsite DLL does not create a perimeter with barriers as does FARSITE4, but sets the underlying fuels to non-burnable for every pixel in the landscape that the barrier crosses.

Example:

FARSITE_BARRIER_FILE: C:\Data\barrier.shp

Switch: **FARSITE_FILL_BARRIERS**

Usage:

FARSITE_FILL_BARRIERS: X

Where X is either 0 for false (no barrier fill) or 1 for true (fill the barriers). Farsite DLL will set all of the pixels inside a barrier polygon to non-burnable.

Example:

FARSITE_FILL_BARRIERS: 1

Switch: **CUSTOM_FUELS_FILE:**

Usage:

CUSTOM_FUELS_FILE: Filename

where filename is the complete path and name of the desired custom fuels file to use.

Example:

CUSTOM_FUELS_FILE: C:\data\customfuels.fmd

Switch: **FARSITE_SPOT_GRID_RESOLUTION:**

Usage:

FARSITE_SPOT_GRID_RESOLUTION: X

Where integer X is the resolution of the background spotting grid.
NOTE: X should be an integer divisor of the landscape resolution, i.e. if landscape resolution is 30m, X should be 30, 15, 10, 6, 5, 3, 2, or 1. The intent is for the background spotting grid to subdivide landscape cells. The background spotting grid is used to prevent more than one spot fire being started in a spotting grid cell, so adjust this parameter to your tolerance for spot fire density.

Example:

FARSITE_SPOT_GRID_RESOLUTION: 15

Switch: **GRIDDED_WINDS_GENERATE:**

Usage:

GRIDDED_WINDS_GENERATE: val

where val is either 'Yes' or 'No'

Default is 'No'

This switch will be ignored if the gridded winds resolution switch is not present or invalid.

Example:

GRIDDED_WINDS_GENERATE: Yes

Switch: **GRIDDED_WINDS_RESOLUTION:**

Usage:

GRIDDED_WINDS_RESOLUTION: X

where X is the resolution to use for gridded winds in the same units as the landscape file.

Example:

GRIDDED_WINDS_RESOLUTION: 200

If using WindNinja in Farsite, you can set the speed/direction tolerances for re-using windninja runs.

Farsite defaults to re-using when winds are within 20 degrees of a previous run AND within 5 mph of a previous run.

Switch: **GRIDDED_WINDS_DIRECTION_BIN:**

Usage:

GRIDDED_WINDS_DIRECTION_BIN: X

where X is the size in degrees to use for gridded winds direction tolerance

Example:

GRIDDED_WINDS_DIRECTION_BIN: 10

Switch: **GRIDDED_WINDS_SPEED_BIN:**

Usage:

GRIDDED_WINDS_SPEED_BIN: X

where X is the size in MPH to use for gridded winds speed tolerance.

Example:

GRIDDED_WINDS_SPEED_BIN: 2