

FW21 Fire Weather Format

FW21 is a comma separated values (csv) file format for fire weather. FW21 relies on recognition of key fields in the csv header to enable use of the data for NFDRS4 calculations as well as for use in fire spread models. The intent of the FW21 csv format is to satisfy the requirements of both NFDRS4 and fire behavior models while both minimizing and simplifying the data format for both humans and software.

FW21 accepts data in both English and Metric Units. Units are part of a required field's name.

*Note: On import, FW21 data will internally convert metric data to English units expected by NFDRS4 and fire behavior models

Required Data

Date/Time of Weather observation

Temperature

Relative Humidity

Precipitation

Wind Speed

Wind Azimuth

Solar Radiation

Snow Flag

The order of fields is not important, required data must be present. This means one of Temperature(F) or Temperature(C) must be present, one of Precipitation(in) or Precipitation(mm) must be present, and one of (WindSpeed(mph) or WindSpeed(kph) must be present.

*Note: If both english and metric unit fields are present for a variable, FW21 will only read the English unit values

Optional Data

Gust Speed

Gust Direction

Recognized Field Names in FW21 Header

DateTime - An ISO 8061 formatted date/time. Preferred format is in local time and includes offset from UTC. The ISO 8061 date/time should include fields for year, month, day of month, hour, minute, second, and offset from UTC.

For example:

2004-01-06T12:00:00-07:00

Indicates January 6th, 2004 at noon local time, which is offset 7 hours less than UTC

2004-01-06T12:00:00+07:00

Indicates January 6th, 2004 at noon local time, which is offset 7 hours greater than UTC

For more information see: <https://www.iso.org/iso-8601-date-and-time-format.html>

Temperature(F) - Temperature in degrees Fahrenheit. Accepts real numbers.

Temperature(C) - Temperature in degrees Celsius. Accepts real numbers.

RelativeHumidity(%) - Percent relative humidity. Accepts real numbers.

Precipitation(in) - Precipitation in inches. Accepts real numbers.

Precipitation(mm) - Precipitation in millimeters. Accepts real numbers.

WindSpeed(mph) - 20' wind speed in miles per hour. Accepts real numbers.

WindSpeed(kph) - 10m wind speed in kilometers per hour. Accepts real numbers.

WindAzimuth(degrees) - WindSpeed direction in degrees from North. Accepts integer numbers.

SolarRadiation(W/m2) - Solar radiation in Watts per square meter. Accepts real numbers.

SnowFlag - Boolean value indicating ground is snow covered or not. Should be 0 or 1. Blank records are assumed to be 0 (not snow covered)

GustSpeed(mph) - 20' wind gust speed in miles per hour. Accepts real numbers.

GustSpeed(kph) - 10m wind gust speed in kilometers per hour. Accepts real numbers.

GustAzimuth(degrees) - GustSpeed direction in degrees from North. Accepts integer numbers.

More optional data fields can be added as deemed necessary. Extra fields not recognized by the FW21 data reader are allowed and their only impact with regards to FW21 data processing is increased file size.

1/22/2024 UPDATE:

The following fields were added as optional FW21 fields. These fields are produced by NFDRS4_cli in the 'allOutputsFile' output file, and allow the 'allOutputsFile' file to be used as a 'wxFile' for NFDRS4_cli input and allows NFDRS4_cli to bypass Nelson dead fuel moisture calculations, GSI calculations, and KBDI calculations, while producing NFDRS4 indexes as output. This is useful when running multiple NFDRS4 fuel models on the same dataset and avoiding the computational cost of running the above-mentioned models.

1HourDFM(%) - One hour dead fuel moisture as percent. Accepts real numbers.

10HourDFM(%) - Ten hour dead fuel moisture as percent. Accepts real numbers.

100HourDFM(%) - Hundred hour dead fuel moisture as percent. Accepts real numbers.

1000HourDFM(%) - Thousand hour dead fuel moisture as percent. Accepts real numbers.

HerbLFM(%) - Herbaceous live fuel moisture as percent. Accepts real numbers.

WoodyLFM(%) - Woody live fuel moisture as percent. Accepts real numbers.

FuelTemp(C) - Fuel temperature in degrees celsius. Accepts real numbers.

GSI - Growing Season Index (unitless). Accepts real numbers.

KBDI - Keetch-Byram Drought Index (unitless). Accepts integer numbers.