IMPLEMENTATION AND EVALUATION

Contents

OBJECTIVE(S)

Upon completion of this lesson, participants will be able to:

1. Demonstrate the changes to FireFamilyPlus and WIMS as it relates to the implementation of NFDRS2016
2. Discuss the NFDRS2016 implementation requirements, associated benefits, and any foreseeable impacts
3. Discuss the process to evaluation and submit feedback regarding the NFDRS2016 and WIMS

NARRATIVE

I. INTRODUCTION

The National Fire Danger Rating System (NFDRS) can be described as a series of interrelated / interconnected models designed to produce values which – when applied in the appropriate context – have the potential to provide meaningful decision support.

The NFDRS models work collectively by assimilating data in a step-by-step procedure (algorithm) to generate one or more values; as needed, the generated values feed other models before producing the result. The NFDRS is a system of algorithms which are driven by computer processors.

II. NFDRS SYSTEM PROCESSORS

With respect to the NFDRS, there are two processors: FireFamilyPlus and WIMS. References will be made to both processors as we bridge the analysis phase of the FDOP to the operational aspects of fire danger rating applications.

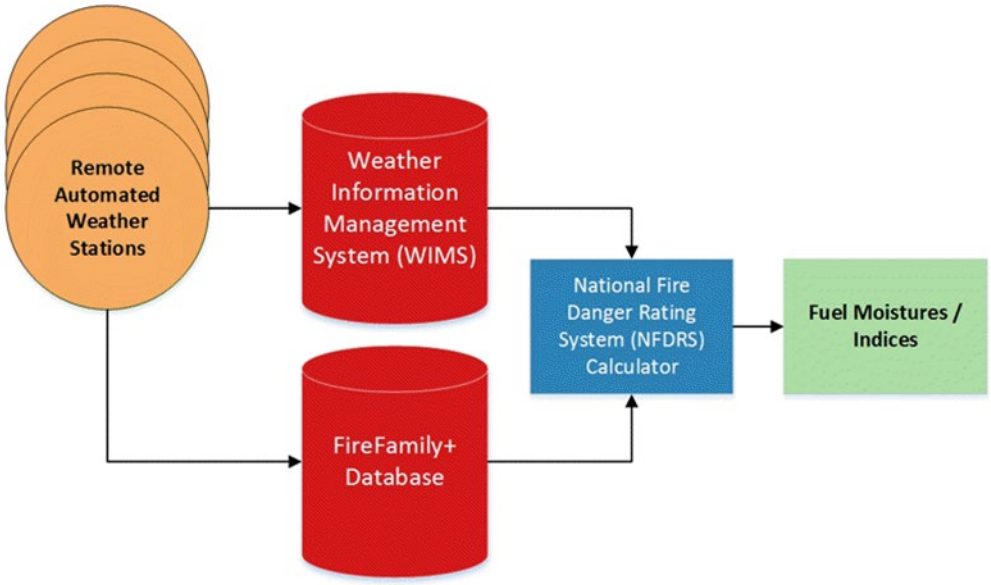
A. FireFamilyPlus (FFP) – Historical Analysis Tool

FireFamilyPlus software offers a suite of analytical and planning tools which provide an objective way to evaluate the many combinations of fire danger indices for fire business decision support. As a stand-alone software application, FireFamilyPlus is an essential tool for analysis in the development of Fire Danger Operating Plans (FDOPs) by computing indexes and components of the National Fire Danger Rating System (NFDRS), and the Canadian Forest Fire Danger Rating System (CFFDR) from weather climatology data. FireFamilyPlus will provide the answers to questions related to analysis and planning (such as climatological breakpoints and fire business thresholds); however, it does not automatically import weather needed for NFDRS outputs, nor does it automatically import fire data for fire business analysis. FireFamilyPlus is supported by the Rocky Mountain Research Station, U.S. Forest Service (Missoula Fire Lab); more information is available at https://www.firelab.org/project/firefamilyplus

B. Weather Information Management System (WIMS) – Daily Operations Tool

The WIMS processor has been designed provide daily operational decision support. WIMS is a web-based application system that houses software for computing daily NFDRS fuel moistures and indices for a network of about 2,000 U.S. Remote Automated Weather Stations (RAWS). The WIMS combines the fire danger processor with a national fire weather database to provide graphical and tabular displays of recent, current, and forecasted fire danger. Like any other software or web-based application, there are

administrative and technical elements which require training and experience to effectively implement WIMS in support of the Fire Danger Operating Plan. WIMS is supported by the Rocky Mountain Research Station, U.S. Forest Service (Missoula Fire Lab); more information is available at https://www.firelab.org/project/weather-information-management-system.



III. NFDRS2016 IMPLEMENTATION

A. FireFamily

1. Changes

a. Fuel Models

Starting with FireFamilyPlus version 5.0, these new fuel models are incorporated into the drop-down menu under NFDRS Fuel Model in the Working Set and represent valid selections. Advantages of the new five fuel model system include greater simplicity and reliability, and the new system will be easier for people in the field to use and understand.

The 1988 NFDRS revision added twenty additional fuel models to the original twenty fuel models which had developed in 1978 (Deeming). These forty existing fuel models were then consolidated into the five new 2016 fuel response types (V, W, X, Y, and Z), based on existing fire behavior fuel models with the addition of a 1,000-hour and drought fuel loading.

Fuel Model Transition Table		
2016 NFDRS Fuel Model	2016 NFDRS Fuel Type	Equivalent 1978 NFDRS Fuel Model
V	GR2 - Grass	A L T
W	GS2 – Grass/Brush	R S C D
X	SH9 – Brush	B F
Y	TL1 – Timber	G H N P O Q U E
Z	SB1 – Slash	I J K

During the transition period, *either* the older NFDRS fuel models (equivalent 1978 fuel models in the table above), or the 2016 models can be used. After the transition period is complete, the older NFDRS fuel models will be phased out. Until that time both the 20 older fuel models and the five 2016 fuel models appear in the drop-down menu.

b. Max SC (Maximum Spread Component)

You may enter a locally derived Maximum Spread Component (SCM) to improve the accuracy of the Ignition Component.

c. Humid

You may also select for each fuel model to a fuel model default Moisture of Extinction (L = fuel model default value) or (H=40%) for more humid climates, usually east of the Mississippi River.

d. Force NFDRS2016 Recompute

Check the box only when a recalculation of the fuel moistures is needed to due to changes in the data or working set.

B. WIMS

The following information is based upon an update to WIMS on June 8, 2018 (*refer to WIMS Technote-2018-01*).

1. Changes

WIMS has incorporated several changes to incorporate the NFDRS2016 Fuel Models, GSI, and Nelson Dead Fuel Moisture Model. Subsequently, consider the following changes:

a. Fuel Models

NFDRS2016 models are now running in the background, using hourly observations from the existing RAWS network to generate a once-daily NFDR record (at the stations regularly scheduled (RS) time) for each new fuel model. This record type is being called type “N” and it

supersedes existing type “N” records that have been being created existing fuel models. It will take about 30 days for the moisture models to calibrate to current weather. The fuel models have generic names and are derived from the established Fire Behavior Prediction System models. They are denoted by the prefix “16.”

b. DIDX

There are now decimal places in the moisture and index values. A new line allowing you to select specific fuel models to display. From DIDX/DIDM you can select to display specific NFDRS2016 model rows via checkboxes in that line.

c. DIDM

The DIDM screen has new columns that track the daily GSI values that drive the live fuel moisture calculations.

d. COMP

The COMPARE screen is designed to allow you to compare outputs from two fuel models at one station. You do not need the Model Manager role to use COMPARE.

e. ENRR

A new type (2016 Indices Only) has been added.

f. ENFDR

ENFDR manages which models will be displayed in an initial DIDX/DIDM screen (requires edit station privileges). There are six changes in ENFDR to support NFDRS2016 that the average user will see.

(1) Active Fuel Models:

A new column (Active Fuel Models) selects what fuel model are displayed on an initial DIDX or DIDM screen. As part of the update display of 2016 fuel models is disabled. Turning these models on and off can be done by the station owner or a person with ACL (Access Control List) access to manage a station.

(2) Slope Class (SLP):

In preparation for WIMS to be able to ingest gridded data in the future, the 5 standard slope classes still exist but there is the ability to put in a specific slope from 6% to 250%. However, it is strongly recommended to continue to use the legacy slope class (for now), which is necessary to maintain compatibility with FFP.

(3) Moisture of Extinction (MXD):

For more humid climates (usually east of the Mississippi River), you may select for each fuel model a default Moisture of Extinction (L = fuel model default value) or (H=40%).

(4) Maximum Spread Component (SCM):

A locally derived Maximum Spread Component (SCM) can be entered to improve the accuracy of the Ignition Component.

(5) Staffing Index Breakpoints:

These values describe the climatological break points used by fire management agencies to guide fire danger-rating related decisions. The values normally represent the top of the "High" and "Very High" classes for the fire danger as determined by the 90th and 97th percentiles (80th and 95th percentiles for the BLM).

SI% documents the percentile level used for establishing break points in the fire danger distribution

Val is the value of the index at that percentile level.

The staffing index percentile values guide in the determination of the staffing levels (SL) and the adjective fire danger-rating (R) displayed as part of the NFDRS outputs.

The appropriate low and high percentile values for a staffing index are established by using FireFamilyPlus to analyze historic fire weather data.

(6) Display Classes (DC)

The number of display classes, when coupled with the "Staffing Index Percentile Values" forms the basis for the "staffing levels" (SL) and "adjective fire danger" (R) fields displayed in the various NFDRS outputs. The number of classes can range from 3 to 9 and is based on local needs. Most units use 5 or 6. DC can vary for each fuel model/staffing index.

(7) “Adopt 2016 Models” Checkbox:

A checkbox is present to signal to WIMS when you wish to abandon legacy fuel models and accept NFDRS2016 as your operational system. This will create a backup of all your legacy fuel models and their NFDR records and then delete them from the WIMS production database. More information on this is being developed. Also, reference the “Forecasted Weather” section below.

2. Forecasted Weather

Forecasted NFDRS weather is not yet available for NFDRS2016. Developers are working to use the existing 7-day National Weather Service fire weather forecasts. Currently, a NFDRS2016 forecast will be populated with -99.00 values. DO NOT choose to adopt the 2016 models until WIMS can generate forecasted NFDRS2016 outputs from NWS forecasts.

REVIEW OBJECTIVE(S)

Upon completion of this lesson, participants will be able to:

1. Demonstrate the changes to FireFamilyPlus and WIMS as it relates to the implementation of NFDRS2016.
2. Discuss the NFDRS2016 implementation requirements, associated benefits, and any foreseeable impacts.
3. Discuss the process to evaluation and submit feedback regarding the NFDRS2016 and WIMS.